

# Abstract Book

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Poster Presentations

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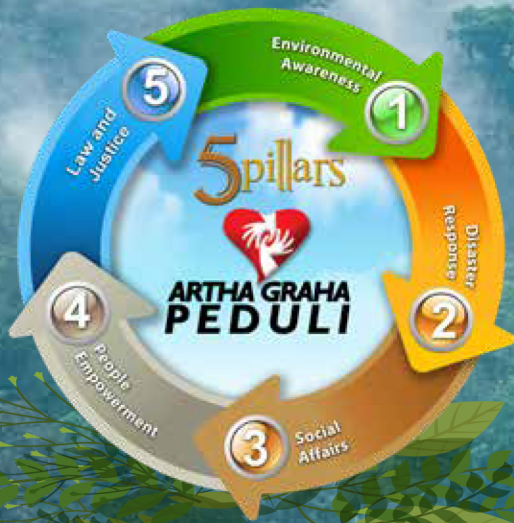
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# ARTHA GRAHA PEDULI

SUPPORTING SUSTAINABLE DEVELOPMENT



The **ARTHA GRAHA PEDULI** Foundation (AGP) is a non-profit organization created by the ARTHA GRAHA NETWORK which focuses on 5 main pillars broadly encompassing sustainability and social growth initiatives.

Pillar One is to support environmental conservation of the natural ecosystem and thus, development of a sustainable infrastructure. Some successful examples of this initiative are: (1) conservation efforts at Tambling Wildlife Nature Conservation (TWNC) reserve, (2) Revitalizing Citarum river and Mangrove Forest, and (3) Sustainable Palm forest.

Pillar Two focuses on responding to natural disasters by minimizing the risk, quick response and post-disaster restoration. Pillar Three is focused on "Social Affairs" by providing food sustainability, education healthcare, and social welfare for the underprivileged and the elderly. Additionally, Pillar Four works to empower people through training, and supporting the development of SME's.

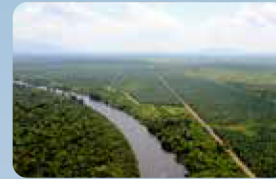
Finally, Pillar Five supports efforts to work with local and national governments to ensure that law and justice is upheld in the society.



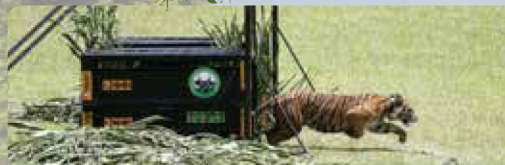
*Citarum River*



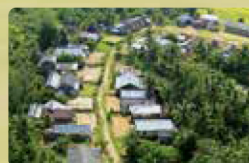
*Palm Forest Conservation*



*Mangrove Forest*



**Tambling Wildlife Nature Conservation (TWNC)** is a conservation area operated and managed by the ARTHA GRAHA PEDULI Foundation. The main objective for TWNC is to protect, restore and promote sustainable use of terrestrial and aquatic ecosystems, properly manage forests, combat desertification, strive to halt and reverse land degradation and minimize biodiversity loss.



*Tambling Wildlife Nature Conservation*

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# Poster Presentations

## Economics and Demography of Natural Disasters

### Economics and Demography of Natural Disasters: The Case of Haiti

**Submitter: Alexis, Angelo**

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**Abstract:**

Over the last thirty years, the Haitian population has increased considerably. Twelve million inhabitants for 27,750 square kilometers. Moreover, as for the production of its side, the trend is strongly downward. To this end, this situation creates a state of affairs where production is growing at an arithmetical rate while population growth is exponential. A great author-researcher describes this situation well: "Even if there were 100 people in a country, and you find that the people who live there are starving, you can conclude that there is a population explosion.

Population growth is a scourge for developing countries, as this situation has disastrous consequences. For example, we can say famine, rural exodus and rapid spread of new epidemics. On the other hand, Haiti's economic growth is very weak, sometimes negative. With a growth rate of 1.2% in 2017 and 1.5% in 2018, one wonders what will be the year of 2019. When we know that the instability is in full swing for the fiscal year 2018-2019.

The year of 2018 reminded everyone in the world that no place in the world is immune to natural disasters. The tsunami in the Indian Ocean, devastating hurricanes and cyclones in the United States and the Caribbean, the Mapou, Fonds Verrettes and Gonaives floods in Haiti have left thousands dead and left entire populations without resources. Therefore, faced with such a situation, one asks the following question: "What economic demography plan for the next natural disasters?"

The image of Haiti has all the characteristics of a country devastated by an unthinking leadership and blinded by a serious deficiency of governability and a system based on lies. The period 1986-2018 can be classified as one where the verdict of an innocent people is pronounced with respect to poverty, mismanagement underdevelopment and an already buried future. Economics, social development, politics, education, health, energy, infrastructure, security and environment have negative characteristics. On the other hand, the behavior of so-called national leaders testifies to their carelessness towards the urgent needs of the Haitian population.

To conclude, we can therefore say that for an economy with very low growth rates and a high population rate, the consideration of natural disasters from an economic point of view is not satisfactory. Also, given the country's social situation, many things are worth doing in order to reach a lasting solution. Now, the big question is: How to control the Haitian demographic rate, given the low rate of economic growth, in order to properly take into account natural disasters?

To conclude, we can therefore say that for an economy with very low growth rates and a high population rate, the consideration of natural disasters from an economic point of view is not satisfactory. Also, given the country's social situation, many things are worth doing in order to reach a lasting solution. Now, the big question is: How to control the Haitian demographic rate, given the low rate of economic growth, in order to properly take into account natural disasters?

## Immigrants and Refugees in Disaster: A New Model for Support

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Contributors to the presentation will also include staff/leadership from Robeson County Disaster Recovery Coalition, East Coast Migrant Head Start Program, and Robeson County Migrant Education Program

### **Abstract:**

#### Background

Strengths and resilience of vulnerable immigrant and refugee communities in the face of disaster are impacted by complex social, economic and institutional factors. As natural disasters increase in frequency and intensity, strategies that address contextual factors are critical, yet significant gaps exist.

CWS' approach to immigrant and refugee communities in disaster builds from a foundation in both refugee resettlement and disaster response and recovery. Work from the last four years has led to a model where disaster preparedness and recovery assistance and staff are embedded within trusted immigrant serving organizations. Supporting organizations in Texas,

North Carolina and Florida as they expand into disaster preparedness, response and recovery has shown their capacity to address communities historically left on the margins.

### Model of Engagement

Several factors are recognized as important for these communities' resilience around disaster, including trust in service providers, capacity of local organizations to shift services, public policy or procedural decisions during a disaster, and relevant and linguistically appropriate means of communication. CWS has built upon these factors particularly in the wake of the devastating hurricanes in the U.S. in 2017 and 2018. Through CWS partnerships with local agencies, immediate and post-response supports are directly provided to communities who are increasingly reluctant to seek assistance. In the process, increased understanding is gained, for example, through case studies CWS is conducting in Texas and Florida to better learn of strategies used by communities during the 2017 hurricanes. The program model takes a strengths-based approach, recognizing that communities and the trusted organizations that serve them are primary building blocks of effective and sustained response and recovery. These communities and organizations are well-placed to identify strategies that work, and strategies that organically form from existing contextual, structural and cultural factors.

Most recently, in the aftermath of Hurricane Florence in North Carolina, CWS initiated a pilot project that embeds disaster response staff directly within a trusted immigrant and refugee serving organization. The pilot seeks to build from the organization's established trust, networks, language resources, and access to communities to further understand the current needs and situation of survivors. The pilot also aims to inform other local organizations how service can better be provided in times of natural disasters.

### Expected learnings

Presenters will discuss findings from the 2017 Hurricanes Case Studies and lessons learned from the North Carolina pilot initiative. Part of the analysis includes how demographics, including socioeconomic indicators, intersect with other factors, context and experience. The discussion will include how findings and lessons learned inform program design and planning, and strategies and approaches to bring champions among the immigrant and refugee communities "to the table" for discussion on better access to basic services. The learnings and approach to the work provide a basis for generating more diverse and inclusive forms of knowledge and information that help vulnerable families in decision making in times of urgency, making social networks more accessible and equitable and, to the extent possible, beginning to explore implications for gender-based structures at household and community levels.

[The Factors Regulate to Community Participation in Disaster Recovery Program: An Experience of Cyclone Aila Disaster Affected Coastal People Bangladesh](#)

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**Abstract:**

Community participation is crucial for sustainable disaster recovery. The philosophy of Build Back Better in sustainable disaster recovery has emerged in the early 90s and progressed by the United Nations office of the Disaster Risk Reduction (UNISDR) Sendai Framework of Action (2015-2030). Bangladesh ranked 7th top disaster-affected country in the world in recent climate risk index (2019). However, Bangladesh has shown remarkable progress in disaster preparedness, response policy and planning, but the disaster recovery phase is still remaining weak and ignore in national policy and planning.

This study aim was to identify the factors regulate to community participation in disaster recovery GO and NGO,s program and provide a model to strengthen the local and national strategies to promote bottom-up participation in a disaster recovery program for sustainability.

The study had employed convergent parallel mixed method design where the pragmatic paradigm and concurrent strategies applied in data collection, analysis and interface. The study interviewed 230 Aila affected people, who participated in the government and non-government recovery program. In addition, 10 key informant interviews and 2 focus group discussion was conducted for qualitative data. The study had developed semi-structure questionnaire for quantitative and two different checklists for KII and FGD, which was submitted to the University of Malaya Research Ethics Committee (UMREC) for getting ethical approval of the study.

Findings reveal that community participation in GO and NGO,s recovery program can be defined as passive participation. Because of project participant has no or limited access to project related decision making, while they have participated mostly in the project related information and consultation. The study had identified eight dominant factors namely, disaster experience and vulnerability, resources, coordination, implementation strategies, ignorance, social capital, commitment and expectation of the community regulate to community participation in the disaster recovery program. In addition, leadership capacity, stakeholder power, political wishes and power structure influence are also predictor to community participation in the recovery program. The study findings argue that to promote bottom-up participation, collaboration and integration between GO and NGOs recovery program needed to improve for updating the existing policy or adopting a new policy. The proposition of the study had developed from the expert level consultation that in the developing country context the “time paradox” in the disaster management administration has created the new challenge for adopting new policy and planning in the sustainable disaster recovery.



This paper is based on the author's Ph.D. work's studying at the Department of Social Administration and Justice, Faculty of Arts and Social Sciences, University of Malaya, 50603 Kuala Lumpur, Malaysia

## Self Determination - Foundation for Disaster Management in Indigenous Populations

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### **Abstract:**

In this time of climate change, we have seen an increase in natural and human-produced disasters. Increasingly, disasters are affecting larger geographical areas that contain greater population diversity, with people experiencing the impacts and aftermaths of climate disasters in different ways. As disasters are becoming more frequent, there is a need for sustainable strategies that allow people to respond and adapt to different stages of disasters. It is imperative to note that Sustainable Development Goals (SDGs) will be derailed at the country level if disaster management policies are not well aligned with SDGs and Indigenous communities. Statistics show that the most vulnerable populations are disproportionately negatively affected, especially when a disaster plan is designed without inclusion and participation of communities. This paper will explore several vital dynamics centering on a holistic approach to self-determination as a locally comprehensible, meaningful and manageable basis for developing local-level disaster management planning that is responsive to the uncertainties of climate change. The SDGs aim to end poverty by 2030, in line with UNDRIP and the United Nations Human Rights Charter. Sustainable solutions require working with communities whose disaster management and response plans are built on self-determination. The paper will explore aspects of participation and planning; how self-determination has proven successful to better social and environmental conditions for communities, in addition to a reducing level of mortality. This paper will further review disaster management policies and case study of Kalinango community of the Commonwealth of Dominica in the West Indies in dealing with disaster management, demonstrating wise practices of disaster management that are rooted in self-determination. This study will be based on a mixed methods study design and examines disaster planning and management literature. The discussion will contribute to an understanding of how local communities are finding coherent ways to interface with institutions, and governments to improve disaster response planning. It will offer a unique empirical case example to a growing literature on the urgency of engagement of self – determination in disaster management and planning. In addition, the study will foreground findings in relation to what self – determined disaster management may look like in practice. The discussion will look at different roles' government, communities and institutions can play to

improve disaster management, with the inclusion of Indigenous knowledge from Kalinango Community in Dominica and Manitoba province in Canada in addition to scientific knowledge to support Indigenous peoples in dealing with disaster.

## Economic Impact Of Natural Disasters In High And Low - Income Countries

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### **Abstract:**

While some disasters, such as storms and earthquakes, tend to be short-live event lasting from several seconds to a few hours or days they can cause substantial damages in a concentrated area.

Other disasters such as drought can be of longer duration, lasting for weeks, months and years.

However, regardless of the type of the event any disaster can leave economic consequences that may linger for year.

Disaster losses manifest themselves in numerous ways, unfortunately, it is nearly impossible to estimate them with great accuracy

In general the economic impact can be assessed based on the losses as a result of the disaster, which can be direct or indirect.

Losses refer to the REDUCTION in wealth caused by DAMAGE TO STRUCTURE or other PHYSICAL ASSETS (e.g. housing, crops, roads).

Directs Losses are those resulting from BUILDING, LIFELINE and INFRASTRUCTURE DAMAGES while indirect losses are those losses as be result of the PHYSICAL DAMAGES, such as reduced tourism, disrupted service provision and decreased productivity.

In contrast, costs refer to the RESOURCES required to UNDERTAKE REPLACEMENT and REINFORCEMENT of the tangible assets that are destroyed.

The recent trend of economic impact from disasters shows the quadrupling value of disaster's losses from 1950 to 2005 globally. The increase in insured losses means that those particular affected local economies are less dependent on the private sector and the government in providing money for recovery.

Evidence suggests that disasters can affect the economy at the NATIONAL LEVEL by hampering

the GROSS DOMESTIC PRODUCT (GDP) for a short period.

The vulnerability of a country's economy to natural hazards is dependent on many factors, including:

1. TYPE OF NATURAL HAZARDS. E.g. hydro-meteorological hazards can affect the agricultural performance more, particularly countries which heavily.

2. THE ECONOMIC STRUCTURE. This refers to THE OVERALL SYSTEM'S PRODUCTIVITY, THE DIVERSITY and COMPETITION between SECTORS and the NATURE OF PRODUCTIVE Capital.

For instant, in the Dominical Republic, the banana plantation industry is one of mains economic driving forces that suffers enormous setbacks due to increased frequency and intensity of disasters, but, because the country has a diversified economic setup with industries that are less dependent on the climate, the country has a strong capacity to recover.

3. THE GEOGRAPHIC SIZE OF A COUNTRY. For very small countries, the hazards may be countrywide, whereas for larger countries, the hazards may only affect certain parts of the country.

4. THE COUNTRY INCOME LEVEL AND STAGE OF DEVELOPMENT.

Developing countries are typically perceived as the most vulnerable countries affected by disasters. The absolute economic loss in developing countries may be small relative to developed countries but in can disrupt the whole economy of the country.

5. THE PREVAILLING SOCIOECONOMIC CONDITIONS. The economic policy, price fluctuation and market regulation may lessen or exacerbate the impact of the disaster.

## Has Foreign Aid Improved Governance and Human Development in West Africa?

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**Abstract:**

This study is an empirical investigation of the effect of foreign aid on the quality of governance and human development in West Africa, adopting the Random-Effects Model (REM) of the Panel Data Analysis and the Estimated Generalized Least Square (EGLS) estimation technique for 15 West African countries from 1990-2015. In order to reveal the effect of foreign aid on all aspects of governance as an aggregate, the researchers constructed a Governance Composite Index using a combination of the Goal Post and Geometric Mean approach on six indicators of governance. They found that most foreign aid improves human development (income, and/or life expectancy, and/or education) but some foreign aid deteriorates the quality of governance. The researchers recommended that the government should have little or no role in the injection of foreign aid into the economy, rather, foreign aid should be channeled through tax effort and private investment. Also, an independent body which would ensure mutual accountability between recipients and donors on a routine basis should be set up as this could be helpful to ensure that foreign aid improves human development without deteriorating the quality of governance in West Africa.

## Normalized economic and crop flood losses in Indian states for 1983-2011: Lessons for Resilience Building

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### **Abstract:**

Floods and associated economic damages is a recurrent phenomenon in India every year. Along with economic damages, floods also bring large damages to crops in the agrarian sector in India. Assessing and quantifying the related economic damages from such disasters has become an important area of research inquiry, especially in the context of climate change. Many researchers have focused on normalized economic damages data as an important tool for analyzing the increasing or decreasing trend of disaster damages. This article analyzes whether there is a significant upward trend in damages due to floods after it has been normalized. It analyzes trends of economic and agricultural loss from floods in 21 Indian states from 1983-2011. It examines the trends in the total damage, normalized damage, total area, crop area affected, and population affected due to floods at the national, regional and state level. The analysis indicates a significant declining trend in normalized economic and crop flood loss data at all India level. The paper analyses the resilience building measures in Indian states and its link to disaster impacts drawn from the study.

## Benefit Sharing between Government and Local Community from the Exploitation of Natural Resources



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**Abstract:**

The research was conducted in the community of Nacoja, northern Mozambique, through a case study aiming to analyse economic benefit sharing from natural resources exploitation between the Government of Mozambique and the local community in promoting community development. The studied community livelihood is based on agriculture and services provided by both the flora and fauna. Mozambique is one of the poorest countries in the world, it was rated with the third lowest Human Development Index in 2013 by the United Nations. Although the policy of benefit sharing was implemented in 2005 through the Ministerial Decree 93/2005 of 4 May, little is known about its effect on rural development. This work is an attempt to fill in this gap. The research was based on fieldwork and semi-structured interviews were applied to nine respondents. The community of Nacoja earned a total amount of about \$ 3,115.00 in the years of 2009 and 2010. The money was used to purchase, set up, run and cover maintenance expenses of the first milling machine in the community that benefited about 800 inhabitants. The policy of benefit sharing proved to be a great opportunity to promote community development. But it needs to be complemented with other actions, such as the training of the Community Management Committees on matters of management of the community fund and its alignment with rural development strategies.

**Bouncing Back: Small business resiliency to and entrepreneurial ecosystems recovery from disaster events**

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**Abstract:**

A significant and growing number of United States-based small entrepreneurial enterprises (or alternately known as small businesses) suffer major losses due to the direct consequences of natural and man-made disasters. Small entrepreneurial enterprises are major employers in most communities, and the losses caused by disasters often result in these businesses permanently closing.

Small business failures are substantial losses for communities of all sizes and each failure weakens the entrepreneurial ecosystem. The losses individual entrepreneurs suffer are usually

understated because the standard metrics for measuring loss are estimates of insured losses made by insurance firms and estimates by government of damage. Generally, estimates exclude losses related to uninsured business interruption losses, income lost during post-event recovery, and losses to owners' capital assets when businesses fail as a direct result of the event.

Correspondingly, there is increasing concern regarding individual enterprises' resiliencies against a given disaster event and the ecosystem's varying recovery results post the given disaster event. Resilient small businesses exhibit strong flexibility in coping with disruption of the typical, everyday social, organizational, economic, and political structures. Recovery results correspond with a given ecosystems' ability to engage in collective efforts of entrepreneurial and social bricolage.

Continuity of individual existing enterprises mitigates disruption and maximizes recovery of the entrepreneurial ecosystem post-disaster. Stabilizing the entrepreneurial ecosystem allows individual enterprises to reduce losses, and begin a revenue and profitability rebound. Existing literature states, business continuity allows the ecosystem to sustain a critical flow of goods and services, and level of employment despite the disaster event. Continuity of individual enterprises and stabilization of the ecosystem form an interdependent feedback loop.

Thusly, resiliency is a considerably salient factor in business continuity and as such needs to be examined to offer small entrepreneurial enterprises a roadmap for recovery. Further, to better understand the characteristics needed for an ecosystem to successfully recover from a disaster event, the "what" and "how" of survival and recovery should be defined. Utilizing the social capital theory to serve as the theoretical framework and through a review of current literature, the study will explore the impact of social and entrepreneurial bricolage on the individual enterprises' resiliency to and the entrepreneurial ecosystems recovery from a disaster event.

## **FBDRC Business Continuity Plan Toolkit**

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### **Abstract:**

Fiji Commerce and Employers Federation, through the Fiji Business Disaster Resilience Council (FBDRC) continue to strengthen its roles with the involvement of FCEF members and other private sector organization in disaster risk reduction, emergency preparedness, response and recovery. To build the resilience of our members and other private sector organization in Fiji, the participation of FCEF & FBDRC at the national, regional and global level is very critical. Importantly, is to gauge the support of government and our development partners.

In 2018, we coordinated trainings for the business communities at the national and local levels for the implementation of the FBDRC Business Continuity Plan Toolkit. Through the funding

from USAID Pacific Climate Ready we held trainings at four major centers in Fiji (Nadi Town, Suva City, Savusavu Town and Labasa Town. We have trained around 150 businesses across all sectors. The training helps to keep business to reduce their risks during a disaster, business will open again after disaster strikes while making sure their staff and families are safe.

## Women's Right to Land Entitlement for Gender Equality

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**Additional Authors:**

Dr Joseph Asan

### **Abstract:**

This study deals with the women's right to land for gender equality. Economic Transformation Initiative, Gilgit-Baltistan (ETI-GB), an ambitious program supported by International Fund for Agricultural Development United Nation (IFAD, UN), aims to strengthen land reforms process in disputed area of Gilgit-Baltistan (GB) Pakistan that is taking place first time in the history. Since, this project is a brick to build the foundation of land reform in GB, especially land policies for women's right to have and to own land is kind of unconventional step in a very traditional society. It would be interesting to have discussion and document the people's response regarding this project.

Since, this is a kind of new project and is introducing a platform for the people to generate their consciousness about the women's rights especially land rights, the study has used mixed method for data collection. For qualitative data, content analysis is used to have a thorough understanding of different types of land reforms across the globe particularly in South Asia. Theoretical understanding of the literature is essential which provides the basis why land reforms are important and how far it plays an important role when it comes to eliminating inequality. Focused group discussions were carried out for verification and triangulation of data. For quantitative, survey was conducted to take response form the people of the region and analyzed. The program is implemented in Ghizer district of GB. 2340 households were identified as beneficiaries of newly developed land. Among them 2285 were men households and 55 were women households. There is a significant difference between men and women households. In spite of great difference it is a great achievement of the donor that in history of GB, first time women are going to be entitled with land ownership. GB is a patriarchal society, many social factors like cultural, religious play role for gender inequality.

In developing countries, such as Pakistan, the awareness of land property rights has not been given proper attention into gender equality development frame works. It is argued that land property rights of women have not been taken into mainstream policy making in the development of nation building process. Consequently, this has generated deprivation of women's property rights, low income level, lack of education and poor health. This paper

emphasis that there should have proper land property right of women in Gilgit-Baltistan Pakistan, provided that the gender empowerment could be increased in terms of women's property rights.

Keywords—Gender equality, women right to land ownership, property rights, women empowerment.

## Drought, Food Insecurity, And Coping Strategy; A Study of Rural Households in Turkana County, Kenya

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### **Abstract:**

Achieving Sustainable Development Goals 1 and 2 – No poverty and Zero hunger – faces a major threat due to repeated experiences of many rural households in Turkana County, Kenya. The second largest (land area) with a population of over 1 million people who are largely pastoralists, face uncertainty regarding the future as a result of drought which leads to the loss of their animals. The inability of many rural households to cope with this shock traps them in poverty and hinders their potential to feed themselves. This study hopes to identify the level of preparedness of rural households in Turkana County, examine the coping strategies they employed, and the impact of Development Partners/ Government interventions.

This study hopes to use a blend of quantitative and qualitative research methods. Focus group discussions and Key Informant Interview will be richly utilized, and questionnaire will also be administered. Purposive sampling technique will be used to identify heads of households, and other samples.

The findings of this research will add to the body of knowledge in the field of Environment and Development. It will also aid in policy formulation and generally scaled up to prevent future occurrences in other African countries.

Key words: Rural Households, Drought, Coping Strategies

## The Political Ecology of Disaster Risk Reduction: What does it mean to be "vulnerable" in Nepal?

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### **Abstract:**



Climate change and natural disaster policy is driven by vulnerability assessments. Vulnerability assessments dictate how the impacts of disaster are evaluated, which factors constitute resilience, and who and what should be prioritized in resource distribution. There is a plethora of literature establishing a typology on the varying and ever-evolving lenses through which vulnerability is defined and assessed. However, while discussing theoretical divergences in the conceptual frameworks of vulnerability, rarely do scholars discuss the on-the-ground impacts of assessors' freedom to decide how they will define vulnerability in any given context.

Promoting economic resilience, for example, through diversifying income away from reliance on agriculture, does not acknowledge potential losses in the intangibles, including tradition, professional dignity, and inter-generational knowledge transfer. Likewise, limiting 'exposure' to include only those whose lives and property are placed directly in a flood zone, ignores the vulnerability of landless laborers whose livelihoods depend on affected land. And using socio-economic indicators at the household level, for instance, will be blind to the diversity of intra-household experiences in disaster. This paper does not suggest that these, or any other particular dimensions of vulnerability, are necessary in redefining the demography of disaster. Rather, it questions potential biases in who exactly vulnerability assessments are serving and questions how well assessments reflect community priorities.

The AndhiKhola Ethnographic Vulnerability Assessment was a 3 month fieldwork project which produced a place-specific vulnerability assessment in Syangja, Nepal. Using ethnographic research methods, the study aimed to distill community perceptions of which people, places, and systems are most vulnerable, and to which hazards. Though initially centered around vulnerability to the AndhiKhola river flooding, the study found that the community places other "hazards", including landslides, government corruption, and the expanding remittance economy, on equal ground with increasingly unpredictable monsoon floods. The assessment was able to articulate the complexities of the human 'ecosystem' and allowed the community to lead the assessment in ways that a more rigid vulnerability assessment would forbid. The novelty of the study highlights the fact that many vulnerability assessments may not be reflective or even responsive to local priorities.

This paper investigates which definitions of vulnerability are most often applied in assessments conducted in Nepal, specifically with regards to natural disaster and climate change. On the basis of both the outputs of the AndhiKhola ethnographic study and literature review, the paper considers the implications of these most commonly used approaches on the political ecology of disaster risk reduction and climate change policy. This paper claims that the demography of disaster, specifically the ways in which we designate who is affected by disaster, and to what degree, has not been sufficiently interrogated. As a result of projecting foreign ideas of 'risks' and 'vulnerabilities', an assessment may produce foreign fixes to establish 'resilience' and 'adaptation' strategies unfit for the community it means to serve. The implications for this process are critical in developing sound climate change policy and resiliency strategy. Thus it is crucial that the many sectors who now find themselves contributing to disaster risk reduction globally, appreciate the significance in selecting the dimensions by which we measure vulnerability.

## Engaging Across the Generations: Children and the SDGs

### Food Waste in the Global North and Famine in the Global South: Engaging Children in Nutrition Habits and Food Waste Audits

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**Additional Authors:**

Safiya Hanan Ahmed

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**Abstract:**

In 2015, the U.S. government announced the first-ever national food loss and waste goal of a 50-percent reduction by 2030. The U.S. Environmental Protection Agency and Department of Agriculture have planned to partner with charitable organizations, faith organizations, the private sector, and local, state and tribal governments to reduce food loss and waste to improve overall food security and conserve natural resources. In the United States, food waste is between 30-40 percent of the food supply. The United Nations is working to prevent four famines in Africa and western Asia and needs to raise \$5.6 billion, fast. All four hardest hit countries, South Sudan, Somalia, Nigeria and Yemen, are affected by conflict, which makes it harder to deliver aid to starving populations. This poster will show the amounts of food waste in industrialized countries, the amount of development aid to Global South countries impacted by famine, the amount of food produced in Global South countries exported to Global North countries, and how students in Global North countries can conduct food waste audits.

### Assessment of children's storybooks for the enhancement of global citizenship and sustainable development

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**Additional Authors:**

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**Abstract:**

The global society is fast-changing, interconnected and interdependent with technology advancement. However, there are attendant challenges in every part of the world such as climate change, terrorism, poverty and others. The situation then calls for global citizenship and sustainable development education with a view to developing individuals who would be more

positively engaging in their world, acting with moral and ethical integrity as well as working for the common good of individuals and the society at large. In the light of this, children are expected to be exposed to curricula that will equip them with appropriate knowledge, skills and values needed to navigate through the fast-changing globalized world. Researchers have advocated building teachers' capacity to become global educators, so that they would be well-equipped to make success of the goal. However, a vital tool that should not be left out of the scenario is children's storybooks, considering the importance of storybooks to children. The study will adopt survey research design. All children storybooks will form the population for the study, out of which 50 will be randomly selected. Oxafam Global Citizenship and Sustainable Development Scale featuring global citizenship and sustainable development indices will be used to assess the contents of the storybooks

## Maternal and Perinatal Death Surveillance And Response as a Tool for Measuring Progress Towards Maternal and Child Component of the SDGs

**Submitter: Aladenola, Olajumoke**

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### **Abstract:**

#### INTRODUCTION

Maternal and perinatal deaths are still significant in developing countries where Maternal Mortality Ratio (MMR) is still far higher than the global average and Nigeria being second only to India in cases of annual maternal deaths. The Maternal and Perinatal Death Surveillance and Response (MPDSR) initiative is an in-country maternal and perinatal death audit which helps in documenting and determining the actual number of deaths, the causes of death, missed opportunities for averting death and practice and policy recommendation to forestall such deaths in other patients. The year-on-year dynamics of the national and sub-national MMR can be a reflection of the performance of the health system and a determinant for the progress towards achieving the first two targets of SDG 3. This study evaluated the outcomes of maternal and perinatal deaths audit for two years in Ondo State, Nigeria and its significant for status of the sub-national health system was highlighted.

#### METHODOLOGY

A maternal death audit was instituted in Ondo State in 2010 through the enactment of a Law known as the Confidential Enquiry into Maternal Death in Ondo State Law (CEMDOS). The initiative became Maternal and Perinatal Death Surveillance and Response in 2016 with the inclusion of perinatal death audit. The scheme mandated a compulsory and confidential reporting of maternal and perinatal death using a data tool in line with national protocol. This retrospective study utilised the reported Maternal and Perinatal deaths data for two years from 2017 to 2018 and the data collected was analysed using SPSS 22.

## RESULT

A total of 98 Maternal deaths were reported for 2017 and 2018. The Maternal Mortality Ratio still remains very high when compared to the SDG target but the year-on-year variation shows a non-significant downward trend in absolute maternal deaths but with no difference in the Maternal Mortality Ratio. Post-partum Haemorrhage accounted for over 40 % and 31% of reported deaths in 2017 and 2018 respectively. The trend for Perinatal deaths in both years revealed doubling of the perinatal deaths to 354 deaths from 2017 to 2018. Intrapartum Asphyxia and sepsis were the major causes of perinatal deaths.

## CONCLUSION

A proper verification of progress made by developing nations towards achieving the key targets in the SDG 3 can be achieved through programmes such as the Maternal and Perinatal Death Surveillance and Response programme. The initiative functions as a monitoring and evaluation mechanism and an effective model that can be useful in predicting the momentum towards the appropriate SDG. It can also be utilised by funders/donors to determine funding requirement and commitments for the support of Maternal and Child Health activities.

**Entire School Model: Model for Mobilizing children in Govt schools in spreading awareness about 17 SDGs framework in Manipur, North Eastern India**

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### **Abstract:**

Manipur is a state of India located in the corner most part of North east India. Literacy rate is 76.6 % as per 2011 census given the remoteness of the place it is an excellent statistics. So education plays a very important role .Inorder to bring awareness about SDGs, engaging school children will be one of the best option here .Awareness about 17 SDGs framework is almost negligible in any sector in Manipur except for handful of ngos who are trying to spread awareness. Hence the collective group of school students will be a powerful force in creating positive change in local communities and achieving the SDGs by 2030.We are all on a SDG learning journey, whatever our age or nationality, some of us will be finding out about them for the first time and that's exactly is the present scenario in Manipur - the SDGs paradigm that no one is left behind will remain a mirage until and unless we teach our children in this remote corner of India that even small lifestyle changes can make a difference and cumulatively build stronger communities and countries as well as a better future for all . Keeping this is mind we developed ESM ( Entire School Model ) starting from our school Khwai Junior High School , Uripok, Imphal. A number of schools have found that the SDGs provide a useful framework for bringing in more complex or local or national issues into the classroom. In our model - The 17 SDGs are introduced to the entire school (through school assemblies, Eco Club, SUPW time

and interaction time ). Year groups or classes then focus in on one or two goals like gender equality, life on land ( biodiversity conservation strategies, gardening etc.)which we can engage with minimum or zero budget. Students engage in group projects, activities and actions related to a particular goal and then report back to assigned teachers at the end of the project term. As we are engaging mostly govt schools to start with local poverty (topics often apt and most often students themselves brings up ) is also addressed through the SDGs in that they can support helpful, distancing pedagogic strategies and help build a more confident society. By presenting complicated but important concepts in simple, easy to understand ,creative and engaging ways in the ES Model we're teaching our children that wherever we belong its not only the duty of developed society to save our planet ,its is our responsibility as well . Such simplicity of message has allowed for a more accessible and all-inclusive approach to engagement with SDG topics with our ES Model.

## UAE SDGs School Awareness campaign; engaging generations to achieve Sustainable Development

### **Submitter: Coetzee, Christiaan**

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### **Abstract:**

Children and youth of today are the reapers of the Sustainable Development Goals (SDGs) as they are the ones for whom the goals were designed for as well as the ones implementing them. However, research shows that there is a lack of awareness among the public about the SDGs. In particular, it is important to share SDGs and involve children of ages 6 to 18, otherwise, it will lead to a misfired opportunity to raise a new generation of SDG change makers. Having this challenge in mind, the United Arab Emirates (UAE) Federal Competitiveness and Statistics Authority (FCSA) created the SDGs School Awareness Campaign to educate children about sustainable development.

UAE SDGs School Awareness Campaign has three elements: creating awareness about SDGs, engaging children, and building their capacity. The campaign aimed at public and private schools, with the target audience being teachers; children aged 6 to 18, and their parents, reached 85 schools, 1,700 children and 100 teachers. The goal now is to increase school participation and reach target of 200 teachers, 3,000 children and their parents in 2019 across the UAE to ensure that no child is left behind.

FCSA team has customized the campaign structure to its target audience – children and



teachers for whom the topic of sustainable development is new for the most part. Therefore, SDG stories were created, which are interactive and engaging storytelling sessions where children can connect a particular SDG to an example from their daily lives. Gamification of the SDGs for ages 14 to 18 included identifying global challenges, choosing one challenge to analyze and suggesting implementable solutions. Games with the younger children consisted of Pictionary and a game called 'Yes or No'. The game consisted of a 'Yes' and a 'No' card that was given to the children. A real life scenario was sketched and the cards were used to engage with the children – i.e. asking whether it is acceptable to bully their friends, and children raising the 'no' card. The 'Yes or No' cards were given to the children as gifts to show it to their parents. The cards targeted the parents through introducing and creating awareness of the SDGs and a call to action to engage through social media applications by sharing innovative ideas related to the SDGs. For example, SDG 6 – a picture of a tap being closed with a caption reading “closing the tap whilst brushing teeth saves water that can be used for cooking food”. This allowed facilitators to get children’s attention, receive feedback, as well as make SDGs learning experience actionable.

Findings include that some schools teach the SDGs in their curriculum. Still, the majority still lacks basic awareness and capacity building skills to successfully incorporate the SDGs into their educational practice. Through the campaign, the awareness levels increased and daily applications of the SDGs were simplified to ensure that it is applicable to the generation. In addition, the parents were made aware of the SDGs with a call to action.

In conclusion, raising awareness, engaging children, and building their capacity are critical factors to achieve, which are addressed through the UAE SDG School Awareness Campaign. The results so far prove that children are excited and ready to tackle the issues towards achieving the 2030 agenda for sustainable development.

## Young people in the transformation of the higher education system for the implementation of the SDGs

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### **Abstract:**

The 2030 Agenda and the Sustainable Development Goals are a strategy to promote effective development that can stand on its own, without compromising the ability of future generations to meet their needs.

Thus allowing, the integration of the generations of young people, who today seek to participate in this transformation. Youth itself represents at least 18% of the world population (UNIC, n.d.), which is significant for our development. Youth is dynamic, innovative and creative, in a world where socio-cultural schemes are evolving due to the continuous transnational mobilizations. (Jiménez, 2016, p.23) These transformations are an opportunity for this group to be encouraged to participate in a true change for their environment.

It must be considered that the main thing that should be implemented, within the institutional framework, is the empowerment of young people. Currently, youth seek and act in political and social processes from alternatives other than institutional ones, through a system of alliances, which call for knowledge of the 2030 agenda in young people. The emergence of organizations by upper level students, committed to supporting sustainable development goals is essential in the perspective of the transformation of higher education.

The University Alliance for Sustainable Development (AUDS), is a student collective that looks for socialize the 2030 Agenda and the Sustainable Development Goals in the university community as well as at the upper secondary level, and in society through the dissemination of the agenda 2030. The transmission of knowledge is very important in order to achieve the objectives, since this is how a pyramidal scheme can be achieved, where young people are the basis of a generational change, informing their peers and even younger generations of the Agenda, as a guide to solve problems in their environment. This second action takes into account the interest and characteristics of the public to whom this information is being given, as well as the opportunities offered by sustainable development to young people. This foregoing has the goal of getting the community to adopt and implement the 2030 Agenda and the Sustainable Development Goals.

As a result, this youth participation will allow education to stop being taken as a simple aspirational link, since it allows the appropriation of the Agenda and thus, the adaptation of this in the study plans, focusing on the realities of today's world.

On the other hand, something indispensable operationally in universities is to identify the way in which young people can participate in the creation of solutions for the implementation of the 2030 Agenda. As a consequence, this highlights the lack of integration of the SDGs in the courses of graduate and postgraduate; Implementation developed critical thinking and raise awareness about the importance of the SDGs.

**Human Capital: The key enabling factor in the effort of realizing SDGs in developing Countries.**

**Submitter: Ewnetu, Muluken Kere**

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**Abstract:**

Problems are everywhere, other factors kept constant; often mankind is the key cause and the victim for the effects for its own did. Many argue that the problems that are sickening Mother Nature now and again would have been relieved through its own resilient natural process unless the involvement of mankind was in the picture. As people are the key players in creating problems, the solution also lies within the vastness of the mind that mankind is endowed with. It has taken billions of years for the mind to evolve to a whole new form of consciousness from where it was in the past and it will keep transforming. Back then, human mind has created enormous blessings for the society and has not escaped from bringing up numerous challenges along with the blessings. The world has noticed how mysteries the mind is and it will stay unfolding miracles in the future. Therefore, having this in mind the paper holds an objective of investigating the ways how the precious capital, human capital, is invested and utilized well to realize several goals of creating sustainable future and would assess best practices from a developing nation perspective. The research will employ an in depth interview for key respondents sampled from development oriented organizations and desk study will be conducted to understand the issue from secondary data. As working in a key organization, National Technology and Innovation Institute, in the development endeavor of Ethiopia, where the case is specifically focused at, the researcher believes there will be a hope of getting a good result that would help the international community directs its resources to cultivate the wealth creating reservoir of the human mind. Understanding and being well aware of the fact that innovativeness lies in a well-informed generation, the paper will zoom in to organizations employing the emerging sector of a society and try to capture the facts supporting and negating the original hypothesis. Talent and skills development initiatives will be examined and their output will be traced for a potential impact in problem solving endeavor.

## Education and the Design of Social Protection Schemes.

**Submitter: Frinwie Mirabel, Abongwa**

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**Abstract:**

This study examines the education and the design of social protection schemes, with the CAR refugees in the Garoua Boulai camp as a case study. The objectives of the study are to establish links between basic and secondary education which most refugees receive in the camps; to capacity building sessions as sustainable measures to resettling refugees, break poverty chains and promote well being among families.

Refugee camp management has been one of the burning issues in recent times with many vulnerable families being victims. While emergency Aid and Humanitarian Aid have sought to resettle the refugees at the borders of the receiving country, there is a gap between sustainable

provisions for the basic needs of refugees to strengthen well being, mitigate poverty and integration into the host country. This is the motivation of the researcher to carry out this study. Thus, an investigation done to ascertain if there are measures that can break poverty chains and transform the undeveloped and abandoned borders of most developing countries where refugees eventually settle is necessary.

The researcher adopted the qualitative measures through in-depth questionnaires to government stakeholders, humanitarian personnel and some refugees. The Theory of Change was also adopted to investigate how the design of the scheme will consider each stage of the delivery of social assistance. An investigation on how refugees can be received, registered and above all, a design of a social protection scheme that links education to a skill independent refugee was also relevant as a sustainable measure to promote family and children well being. Therefore, the researcher envisages a transformation of refugee camps from settlement camps to an area which attracts citizens who come to do business, learn some basic skills and above all strengthen family well being through education and capacity building.

With these, some evidence is used from the research to advise governments on the need to promote social assistance schemes and invest in social protection schemes to other poverty stricken citizens with the hope of breaking inter generational poverty, strengthen family well being and for making social protection popular for other governments to emulate.

Keywords: Social Protection, education, capacity building, refugees, Theory of change.

## Engaging Children with the SDGs by Increasing their Network

**Submitter: Kigotho, Jamali**

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### **Abstract:**

For any developments to be truly sustainable it is paramount to engage the younger generations. Unfortunately, it's hard for many children to understand or empathise with sustainable development goals (SDGs) that they have no experience with. This problem could be mitigated by increasing the diversity of children's world views. While a child in Tanzania might have a strong first-hand understanding about SDGs 1, 2, 4 or 6; a child in Australia might have a strong understanding of SDGs 9, 12, 13 or 16. Bridging this gap of experiences would be a crucial first step in global understanding and engagement with all the SDGs amongst our future generations. Children, especially in the first world, are developing shorter and shorter attention spans. Merely talking to children about the SDGs is unlikely to produce the level of engagement required.

I believe creating an annual competition for teams of children from around the world to develop creative solutions to solve a different SDG each year. Teams would be made up of ten children aged 14-18, all from different countries. Participants would sign up as individuals and

be sorted into teams with diverse backgrounds, guided by two industrial or academic mentors. Social media services such as WhatsApp often have agreements with telecommunication companies in countries such as Kenya allowing the services to be used for the international communication required within these groups without forcing students to struggle with the cost. Since over two thirds of people have mobile phones, social media would be an ideal method for participants to communicate with each other and their mentors.

Teams will be assessed on the potential impact their idea could have on achieving the specified SDG, the feasibility of their project and the creativity of their solution. The top five teams would be awarded flights and accommodation for two weeks in a country they believe their solution would be best implemented in with a grant of US\$3000 provided to commence the project. Not only would this give many children the experience of a life time to see a completely different part of the world, but it would give them a greater understanding of the impact they can have on their own future. Additionally, they would have opportunities to learn and develop a variety of professional skills such as teamwork, communication and leadership.

This competition would provide teenagers from a vast array of backgrounds a platform to share and learn from alternative worldviews. It would also provide motivation for kids to engage with the SDGs at a crucial age where they are thinking of what they want to do with their own future, encouraging them to utilise sustainable practices with their own careers going forward. Competition is one of the truly great motivators across all backgrounds and this will provide participating children a new found understanding and appreciation of the SDGs and their importance.

## I'm a Girl, I'm Important

**Submitter: Leon, Maricelle**

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### **Abstract:**

Fundación Tropicalia (FT) drives sustainable, socioeconomic development in the town of Miches, Dominican Republic, by working in multisector partnerships alongside the local community, allowing for innovative, high-impact programs and the efficient use of resources. Its strategic priorities are education, environment, productivity and sociocultural advocacy. The foundation forms part of the sustainability strategy of the tourism development project, Tropicalia. As an active UNGC signatory, Tropicalia issues annual sustainability reports; we've reported against GRI Standards since 2017 to better align our communications with international standards and complement UNGC transparency efforts.

Fundación Tropicalia's 10-years of work in the community has brought to light the realities and struggles women and girls face in emerging tourism destinations and emerging economies. Girls living in conditions of risk and inequality, are more likely to experience violence and poverty increasing their chances of teenage pregnancy, early marriage, exploitation and

incomplete schooling. In Latin America & Caribbean, the Dominican Republic ranks 5th in teen pregnancy, 3rd in child marriage and 3rd in femicide; this is why our work with young girls is so important and has become a strategic priority.

Additionally, tourism accounts for more than 10% of the world's GDP, creating nearly 10% of world's employment. While the industry is a key driver of global economic growth, women are more susceptible to tourism exploitations like dangerous working conditions, sexual discrimination, sexual harassment, prostitution, slavery, and human trafficking.

This is why we created Soy niña, soy importante (SNSI, or "I'm a Girl, I'm Important") an annual summer day-camp for at-risk girls 9-12 years old that provides them with the tools they need to be self-reflective, critical thinkers and make timely life choices, ultimately diminishing the gender gap in terms of capacities, access to resources and opportunities. SNSI advances Sustainable Development Goals 3, 4, 5, and 17 relying on partnerships to develop and impart innovative curriculum: Education in values; Artistic expression; Development of interpersonal relationships, self-esteem and self-awareness; Sex-Education and STD prevention; Gender equality; Nutrition and sports.

At SNSI, girls learn about their rights and explore the importance of the role they play in their family and society. This program uncovers the potential of its participants, encourages them to dream big and make decisions appropriate for their age, like continuing their studies or avoiding unplanned pregnancy. 300 girls and 96 volunteers participate annually, with a return rate of >80% for both groups. Since inception, SNSI has reached a total of 1,463 participations, 404 volunteers, 111 sponsors, 86 workshops, and 18,242 volunteer hours donated. Indirectly, the camp has also impacted the families and school community, since it includes a series of talks and awareness-raising directed at parents, grandparents and teachers, in order to expand the camp's messaging. Many girls have even benefited by obtaining their national documents, as they convince their parents to procure them in order to sign up and participate in the camp.

Beyond numbers, SNSI changes lives: girls expand their worldly views; identify careers; make friends; improve hygiene; learn to protect themselves from potential abuse; and become inspired by both female and male role models.

## Engaging Children and Teenagers and the SDGs in China, Europe and the United States

### **Submitter: Levin, Robert**

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### **Additional Authors:**



Jud Ireland, Chairman, EDR Global

## **Abstract:**

### OVERVIEW

Building capacity for the SDGs requires attention both to how children and youth are affected by the SDGs and how they might be integrated into efforts to learn about and achieve the goals. This abstract will examine examples of good practice in intergenerational engagement and models of engaging children to achieve the SDGs.

### GOALS

To highlight cases where children and youth became prominent leaders of NGOs, civil society and political activists and explain why their voices matter and are uniquely influential calls to global action that must be taken seriously


How legislatures, NGOs, multinational organizations and third-track diplomacy can integrate the views of this important stakeholder community and give platforms to qualified children and young people to influence other stakeholder communities

### Case Studies

Greta Thunberg. The climate change solutions movement has prominent adult leaders and structure, but a 16-year-old Swede, Greta Thunberg, has drawn global attention and inspired tens of thousands of adults and youth protesters. Greta has called for school strikes to raise awareness of global warming, at the January 2019 gathering in Davos, Switzerland, and produced a highly regarded TED Talk.

Malala Yousafzai, as a young girl in Pakistan, defied the Taliban, demanding that girls be allowed to receive an education. She was shot in the head by a Taliban gunman in 2012, but survived and went on to receive the Nobel Peace Prize for her activism.

Vincent Loka of Indonesia, age 23, is one of the three founding partners of WaterROAM, a social enterprise developing water filtration solutions that bring rapid access to clean drinking water in disaster-hit locations. One such solution is Fieldtrade Lite, a product that fits easily into a backpack and can filter dirty river water within minutes.

Madan Poudel, a youth agriculture activist and student from Nepal, demonstrated how climate change was affecting his community, and how farmers were trying to adapt to an increasingly variable climate. 

MADAN IS SEEING HOW FARMERS ARE SWITCHING FROM RICE PLANTING TO LESS WATER DEMANDING CROPS, SUCH AS FINGER MILLETS. PHOTO: DOLL DAMNED

## Models of Engagement for Children and Youth Activists

Young Leaders for the SDGs - UN.org Over 60,000 students have been activated by this youth leadership organization <https://www.un.org/youthenvoy/youngleadersmeettheleaders/>

Earth Day Running (EDR) Global, China, Jud Ireland, Chairman; EDR Global. In China we engaged over 168 TV stations to promote environmental education led by children and young people to broadcast Earth Day Running events in 30 cities.

ECO BOYS AND GIRLS & SDGs Program: <https://www.childrensmuseums.org/images/Webinars-Calls/EBAGPresentationFinal.pdf>

ECO BOYS AND GIRLS & THE UNITED NATIONS SDG's Book & Program partnered with SDSN Youth & The Association of Children's Museums to bring the landmark Global Goals to children around the world

<https://www.childrensmuseums.org/images/Webinars-Calls/EBAGPresentationFinal.pdf>

The e-book, ECO BOYS AND GIRLS® & THE UNITED NATIONS SDGs, that introduces children to the UN Sustainable Development Goals

The Association of Children's Museums host storytimes or other programming using the ECO BOYS AND GIRLS® & THE UNITED NATIONS SDGs ebook

### Sources:

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<https://www.un.org/youthenvoy/youngleadersmeettheleaders/>

<https://www.childrensmuseums.org/un-sustainable-development-goals>

## Engaging Youth for Peace in the Democratic Republic of the Congo

**Submitter: Lopez Anselme, Marina**

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### **Additional Authors:**

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**Abstract:**

RET is an international NGO committed to protecting and meeting the needs of young people made vulnerable by displacement, violence and disasters around the world. In many of its projects, RET seeks to engage youth as agents of peace in their societies. In the Democratic Republic of the Congo (DRC), since 2012 RET is working with child and adolescent former soldiers, adopting a holistic approach focused on reintegrating ex-soldiers into civilian life after having been engaged with armed groups. This is a long and complex process that requires a balanced approach that targets not only ex-soldiers, but also local vulnerable youth, their parents/caregivers, the local communities into which the ex-soldiers reintegrate, and an engagement of armed groups to prevent further recruitment. RET's approach involves all these actors through educational approaches, income-generation support, small business training and comprehensive follow-up mechanisms.

Plagued by a long-standing and complex conflict in which numerous armed actors play a role, armed groups in DRC take advantage of the conditions of poverty, the lack of education/livelihoods opportunities and the lack of awareness amongst communities, parents, caregivers and youth. RET seeks to address these issues by its innovative and holistic DDR programme in North and South Kivu, which brings together all stakeholders to address the drivers of recruitment and identify sustainable solutions to the phenomenon of child and adolescent soldiers. The overall goal of RET's DDR programmes is to contribute to building and consolidating durable peace and stabilisation in the Kivu Provinces by using and strengthening education as a tool at different levels, in order to trigger processes of demobilisation, reintegration and prevention.

Ultimately, RET seeks to protect children and adolescents affected by conflict, at risk of recruitment and associated with armed groups, and enable them to become active agents of change in their communities, and hereby enable their societies to move towards peace. In addition to prevention and demobilisation, attempts are made to address poverty and the lack of livelihoods opportunities aimed to address one of the root causes of child/adolescent soldiering, and therefore one of the driving forces behind conflict in general.

At a more political level, RET raises awareness among authorities and armed groups commanders. Through the involvement of local partners with expertise in the field, RET ensures that information on the national and international legal frameworks is transferred to the commanders of armed groups, in order to facilitate the demobilisation of young recruits within their ranks and prevent further recruitment.

RET's holistic approach in DRC has proven successful: over 90% of ex-combatants reinserted into schools are still in school after one year. Over 85% of trained key stakeholders, including leaders of armed groups, have signed letters of commitment to refrain from, or to support the prevention of, the use of those below 18 in armed groups. Finally, about 1% of reintegrated former child/adolescent soldiers have re-joined armed groups.

## Give them voice; share ideas, inspire actions.

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### **Abstract:**

In the twenty first century, is increasingly common to see children and teenagers engaging and spending time on the virtual world. Whether watching videos online or posting their own videos, what attracts them is the visibility they get in platforms such as YouTube, making them feel important and empowered by the voice that's given to them and also the connection to a whole new world of information, not even having to leave their rooms. The problem is that the content that's offered, that those kids and teenagers consume daily, aren't always relevant and sometimes even healthy. But what IF we use their thirst for technology as a way to canalize and spread subjects that matter? What IF we give them voice, in a safe virtual environment, to speak about global issues, and give solutions to this problems? What IF they can learn via an app about the SDG's at the same time they start campaigns in pro of a cause, inspiring others to make moves, take actions? We can use social media and technologies as a way to bring the SDG's closer to their reality.

In that point of view, came the idea of developing an app where kids and teenagers can share ideas, actions they took and thoughts that impact people's life and their communities, by videos and articles, being directly related to the sustainable development goals. This way I believe we'll be able to bring the SDG's closer to their realities, in an accessible way, helping them to develop soft skills such as public speaking, leadership, conflict management, decision making and communication skills, developing in them the idea of a global community, a network of kids and teenagers being protagonists, impacting in their society and inspiring one another by sharing. To leverage the app reach, a partnership with schools and ONG's are considered and longing.

## Empowering young people through educational models

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### **Abstract:**

At the present moment, prospects for meaningful sustainable development are threatened globally. This is of particular concern in Australia, with an economy so reliant on fossil fuel production that it places as one of the highest producers of CO2 emissions per capita internationally. With global figures anticipating a rise of over double the Paris Agreement's

1.5°C goal, climate change is highly likely to jeopardise the prosperity of future generations unless climate change is politically securitised as a national emergency. Thus, it has become increasingly apparent that young demographics must be integrated into the process required to achieve SDG's owing to their disproportionately threatened futures over that of adult demographics. A major barrier to children attaining awareness of and being involved with SDG progress is evident in Australian education structures which fail to provide adequate opportunities and support for young people. Moreover, lack of individual autonomy in young people is exacerbated by such inadequate education systems, leading to feelings of disempowerment. It is vital that opportunities for empowerment through education and intergenerational support are implemented throughout Australian educational institutions to allow children to be integrated into the work of SDG's. Although various independent organisations exist which promote tools for youth empowerment in Australia, lack of a wider systematic support and governmental failure to securitise climate change results in insufficient accessibility. This study evaluates interviews with young people conducted by various Australian NGO's, research into successful international frameworks for youth programs, and recent political reactions to youth activism in Australia. Based on the provided evidence, it is suggested that opportunities for children to learn about and effectively engage with SDG's be increased nationally throughout educational institutions to empower youth demographics. Avenues for implementation would be plausible and effective through extracurricular activities in addition to classroom education programs. This is deemed plausible based on successful examples of international frameworks. Moreover, successful frameworks indicate an ability to strengthen community ties and thus, social sustainability is additionally promoted through localised action efforts. Adopting a bottom-up approach through schools and increased community participation is vital for children to learn about the significance of SDG's and become empowered to contribute towards shifting business-as-usual norms. Children possess the capacity to play a role in politically securitising climate change, but supportive systems are required to initiate progress. Considering the multifaceted nature of the SDG's, increased educational opportunities has the potential to indirectly effect all SDG's. However, SDG's 4 (Quality Education) and 13 (Climate Action) would experience direct ramifications from a change in educational experiences for young people.

## Language as a tool for promoting good health among Nigerian Children in minority groups

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### **Abstract:**

Nigeria, like many African nations, is a multilingual and multicultural nation. This means that there are many languages in contact. In Nigeria, it is estimated that there are five hundred and twenty languages. Out of these five hundred and twenty languages in existence, only three- Yoruba, Igbo and Hausa are considered to be national languages. These three languages are classified as major languages while five hundred and seventeen are labeled minor. Even though

English language plays the major role, some roles are assigned to these national languages. They are used in the educational, legal, religious and entertainment domains. No roles are assigned to the minority languages. This means that they are not used in education. This inequality has very serious negative impact on the children that speak minority languages as they do not have basic access to information. Children that speak major languages have access to information since the major languages are the ones used in the mass media and also for education. In Nigeria, medical research is made in English and efforts are usually made to translate these into the three major languages while the other minority languages are neglected. This means that the children from minority groups are ostracized. This is counterproductive to the aim of the Sustainable Development goal number 3 which is aimed at promoting healthy lives and good well-being for all ages. This paper argues that for this goal to be achieved there must be a deliberate decision to translate medical research into all the languages in the country. This will enable children from minority groups to be aware of and be included in the SDG plan. The paper also argues that the government must pay attention to the linguistic resources available in Nigeria so that no one will be robbed of valuable information about global health practices because of the language they speak.

## **Advancing Oral health policy for mandatory dental screening before admission into public primary and secondary schools in Lagos, Nigeria.**

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**Abstract:**

Background:

1. The oral health of children is a significant public health issue that considerably affects nutritional intake, growth and development, daily learning activities, sleep pattern, self-esteem and quality of life. In Nigeria, limited progress has been made in reducing the prevalence and burden of oral health problems such as dental caries, Noma and oral cancer due to absence of national data, inadequate budgetary allocation, dearth of personnel, poor policy framework/implementation, and challenges of care access.

2. Lagos state has a large, diverse population, hampered by illiteracy and poverty and school based dental screening is a strategy that can potentially reduce the prevalence of oral diseases among a vulnerable population in resource poor settings. This document proposes secondary



prevention through screening for a significant proportion of children in Lagos State and will be a veritable source of Data for oral Health planning.

#### Proposed Interventions:

3. A draft policy document is proposed for the Ministry of health for legislation mandating a low-cost comprehensive oral health examination to screen every child admitted into Primary or Secondary School in any of the State Government owned Schools in Lagos State. Each child will receive an oral health education leaflet and a duplicated annual dental screening form in addition to all the other requirements he will provide before being cleared for resumption when the academic year commences.

4. The parents of the child will then be expected to present the form at any of the Lagos State owned General hospitals for dental screening. The children will receive expedited attention and will not be kept waiting unnecessarily before being attended to. Students that have any form of dental disease will however be required to open a dental card at the clinic and have their treatments done as soon as possible. Except the dental treatment is found to be very expensive, the parents would be firmly encouraged to have the treatment done before the academic year commences and the form can be filled and signed. The school authorities would be notified if the parents cannot bear the cost and the ministry of health would be duly informed. Once the child is examined and found to be free of dental disease, the form can be filled and signed by the attending dental practitioner and duly stamped. A duplicate would be retained in a dedicated file in the dental clinic while the main form will be returned to the school. The schools will keep the forms in a dedicated file and at the end of each admission cycle, a report on the oral health status of the children for each school must be submitted to the Ministries of Education and Health. The preferred format for submission should be an excel spreadsheet containing the biodata and the summary of dental findings and treatment provided as applicable for each child.

#### EVALUATION

5. Short and long term evaluation will be done to assess coverage rate, the number of dental diseases identified, number of treatments done, the satisfaction of parents and children with the services while the cost- benefit analysis of the services will be determined using a combination of qualitative and quantitative methods. The results of these analysis will be utilized to justify further government commitment of resources to this program.

#### CONCLUSION:

6. Strategies to reduce the burden of disease in developing countries must focus on policy design/implementation and preventive interventions. This proposed policy can help to decrease or eliminate barriers to access. It can also increase the number of children who will receive both

preventive and curative oral care and also improve their knowledge of oral health.

Keywords: Oral Health Policy, Screening, School health program, Access to care.

## Engaging youth to Sustainable Development in Brazil

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### **Abstract:**

How the Sustainable Development would be imagined in a small rural city in a developing country? In Brazil, a peculiar experience committed with Sustainable Development Goals is the Nucleus of Research in Engineering, Science and Sustainability – NUPECS: an experience operated in the countryside of Rio Grande do Norte State, Caiçara do Rio do Vento. In NUPECS can be seen 4 different experiments of sustainable constructions: house of long necks, house of PET bottles, house of tires and the green castle done with Heineken bottles. This area had become very popular as an unique place where can be seen different possibilities of use of waste materials. The NUPECS goal is be a place of sustainable education.

NUPECS had received organized groups from public and private schools and researchers from universities. In April 2019, was applied a survey to evaluate how the visitors evaluates how the initiative can be perceived as a place of Sustainable Development Goals practices applied to children and youth.

This study aims to measure the impact of NUPECS actions in the development of empowerment for the 17 SDG.

Was applied a questionnaire containing 12 questions to 24 students of the public school system, in the age group of 14 to 18 years.

As result was possible identify: based on the application of the questionnaires it was observed that among the interviewees, 65% are women and 35% are men, a good indicator of participation of women in education activities, but also a worry about why the boys are not participating in school activities.

Some important results related to Sustainable Development Goals (SDG):

1 - One of the actions developed in NUPECS is the social innovation agriculture techniques to produce food. 96% considered that NUPECS provided opportunities in rural areas to prevent poverty (Goal 1 – No Poverty).

2 - Everyone has learned that organic farming is important for producing healthy food and improving the health of the population (Goals 3 - Good Health and 12 – Responsible production). In NUPECS had been built aquaponic system to produce food and be a space of education. Community empowerment has been conducted on the technology of the aquaponics system: Duda is the native person who will perform system management. The way the aquaponics system is implemented and the explanation of this process for people in the community is a way of transferring knowledge and promotes Goal 4 – Quality Education.

3 - Considering the needs for discuss sustainability with the children and youth, NUPECS had promoted lectures promoting awareness about sustainable development and its goals. All the students interviewed perceived that NUPECS is a space that contributes to quality education (Goal 4).

4 - 96% realized that girls should be stimulated to scientific careers (Goal 5 – Gender equality). Lectures of professor Julio Rezende emphasize very currently this aspect.

5 - Everyone learned about water storage and use (Goal 6 – Clean Water and Sanitation). It is very important harvest water for dry seasons.

6 - 87% have learned that it is important to prepare for climate change, eg drought (Goal 13 – Climate Action). Was Perceived ignorance by the audience about what to do during the droughts.

7 - For 96.0% of the interviewees, NUPECS sensitized the importance of correct waste disposal and avoiding the impact on the environment (Goal 15 – Life on Land).

8 - 91% considered that the NUPECS partnership with the school is positive (Goal 17 – Partnerships for the Goals). The School Doutor Geraldo published a collection of photos in Facebook page registering the participation of students during the technical visit. There is a proposal to happen one visit by month of schools in NUPECS.

9 - Everyone has learned in NUPECS one or more sustainable habits to be applied in daily life (home, school, work).

Based on the work being developed by NUPECS, it was observed that children and youth are aware of sustainable development and that they are expanding their knowledge about sustainability and developing a critical sense about it, a fact that begins to fill the knowledge

gaps surrounding SDG. The future of these agents of change would be brilliant contributing to the sustainable development and a better world.

## Assessment of how Youths Promote Tourism at the University of Ibadan Zoological Garden for Sustainable Planning and Management

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### **Abstract:**

The study aimed at assessing how youths promote tourism activities at the University of Ibadan Zoological Garden. The age categories of people patronising the garden, factors attracting these people, how their patronage is sustained and how the wildlife within the garden is sustained were assessed.

The study adopted the descriptive approach with the primary focus to describe how youths are promoting tourism activities in the zoological garden. Key Informant Interview, Structured and Unstructured Interviews, Focus Group Discussion, Participant Observation and Questionnaire methods were adopted to collect data. A total of 390 people participated in both the interview and questionnaires sent out for inquiry.

52.1% of the questionnaire respondents were males and 47.9% were females. We found that more university students (48.2%) participated in the questionnaires sent out for inquiry, while 32.6% were secondary school pupils, 13% were polytechnic students and 2.9% were primary school children. Out of those that completed the questionnaires, 82.6% were singles and 68.2% were Christians while 31.8% were Muslims. They were almost all Nigerians (97.1%) and are mostly from Oyo state (58.1%), Osun state (14.6%) and Lagos state (12%). Majority of them (90.6%) were within the ages of 10-38years, 7.3% within the ages of 39 and above years and 2.1% are within the ages of 9 and below years. Young people are attracted to the garden for activities such as education, entertainment, research, recreation, leisure, to see animals and to enjoy the safe and quiet environment. Children are attracted to the children play ground while some visit the site for spiritual purposes. Patronage of the garden is sustained by awareness creation through word of mouth, Facebook, website and invitation of schools through formal writing. The improvement of the zoo environment and facilities as well as staff service condition also serve as means of sustaining patronage. The wildlife and the garden as a whole are sustained through the proper maintenance of facilities such as enclosures, water, electricity and the provision of animal feeds as well as medical facility for animals' well being.

The garden is a youth tourism promotion centre and majority of its visitors are students from

nursery, primary and secondary schools, universities and polytechnics whose activities in the garden are majorly for education and entertainment purposes.

In order to sustain the garden, it is recommended that more emphasis be laid on the welfare of animals in terms of feeding, hygiene, comfort, freedom from fear, and distress, and freedom to express natural behaviour. It is also stated that management should make sufficient funds available and promptly for the maintenance, upgrading and smooth running of the zoological garden. Tour guides should be trained and more use of social media is recommended to management for marketing the zoological garden.

## Youth Empowerment through Community Initiatives: A Case Study of Bangladesh

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### **Abstract:**

In today's world the youth is facing the most of hardships and lack of belongingness within the society. The young population across the globe has reached a remarkable 1.8 billion out of 7.3 billion, and most of them live in developing countries like Bangladesh. Some 47.6 million or 30 percent of the total 158.5 million people in Bangladesh are young (10-24 years), and it will be between 10 and 19 percent by 2050, according to it (UNFPA: 2014). Youth in Bangladesh constitute a big chunk of the population, yet it remains the most subjugated and marginalized. The youths of Bangladesh are stricken with multifarious problems that are rooted in social structure and economic condition of the society in which they live. Youths are the main victim of poverty that constrains their proper education, training, and development. They do not get satisfied job due to lack of efficiency and skill. At the same time, due to shortage of job opportunities in formal sector many youths are remained unemployed. On the other hand, because of overpopulation many youths are underemployed in agriculture sector also. However, frustration is another complicated problem of youth of Bangladesh. In addition, there are other forms of problems faced by youths, particularly young women in Bangladesh such as early marriage, dowry, women trafficking and so forth. The problems of youth stated above are barriers to overall development of Bangladesh. Therefore, problems of youths should be addressed with utmost sincerity through proper plans and programs in order to transform young people to skilled and productive workforce so that they could involve in income-earning activities, lead a satisfactory life, and contribute in national development. Youth empowerment is the encouragement of youth involvement and youth participation in different areas of society. Involvement is a first step towards participation. Nevertheless, being involved does not mean youths have a voice (Cornwall 2008, 278). When there is space for young people to speak freely and obtain influence that is when genuine participation starts. Hence, involvement and

participation stimulate youth development and responsibility towards their community. By providing a youth empowerment platform, youths will first go through a personal development, before they develop responsibility towards others and finally they will obtain leadership skills. Participation is one of the leading principles of the Universal Declaration of Human Rights. The right of young people to participate in institutions and decision-making processes that affect their lives are stated in diverse UN agreements (United Nations Youth 2012, 2). Youth Civic Engagement is one of the most enabling tool for identifying the deep-rooted causes of the problems, participatory plan of action and overcome procedures. Governments of Bangladesh have already initiated New Youth policy and many youth-led programs have been going on through government & NGOs. Through this paper, try to understand the existing youth situation and some selected youth development programs of Bangladesh, identify the major constraint and given the recommendations for moving towards on sustainable way.

**Key Words:** Youth Empowerment, Community Initiatives, Participation

## Expected Distance to Achieve SDG 4: A Dis-aggregated Analysis of Pakistan to Ensure Data-Driven Strategies

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### **Abstract:**

Achieving the Sustainable Development Goals (SDGs) is a massive task but not an impossible one. Can we achieve these goals during the next 11 years? To answer this question, we need to benchmark where we stand today and to figure out how far we have to travel? Subnational achievement of SDGs is imperative for the development of Pakistan. Data is the gateway to strengthen accountability for the SDGs and conducting a needs assessment, to align local policies, build capacities for shared priorities and to promote ownership. Data is crucial to create the baseline, benchmark progress for national monitoring, identify the priorities, to improve decisions based on evidence for policy makers and to implement a systematic approach. For policy implications in education, it is important to assess acceleration of a country's progress on SDGs.

We find out the expected distance to achieve the universal literacy goal under SDG 4 in



particular for Pakistan at subnational level by using the data of last two decades from the national representative survey. Disaggregated data at sub-national level indicates women literacy rate is even less than half of that of national level in some provinces. Gender disparities is a great challenge in Pakistan while rural areas require more assistance. Our results show that it is not possible to achieve SDGs through business as usual. Pakistan will hardly be able to achieve 100% literacy even after 100 years of its birth. There is a lot of heterogeneity among provinces, urban and rural population, and between male and female. Some districts have literacy rate around 85% while there are other districts who have female literacy rate even below 20%. This analysis can draw attention to the SDGs and their role as a tool for guiding national and subnational policies, and, long-term strategies for inclusive development.

Bridging the gaps among provincial developments in terms of education is desirable, even 100% literacy rate can only be achieved once its weakest unit achieves the target. Women literacy rate is very low. Denying gender equality is to deny half of the country's potential. The policy for everyone means; for every child and women, in fact for every least developed area. To address these challenges such that “No One is Left Behind” is a gigantic task. However, we believe that learning lessons from districts with a significant improvement in literacy over past two decades; by a strong commitment, academia and technical assistance and making governments accountable at levels, these goals are achievable.

## **Good Practices at the Nexus of Water, Energy, and Agriculture**

### **The Kingdom of Jordan ‘s development towards attaining a green economy: a case of policies and practices**

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#### **Abstract:**

Jordan is a country in the Middle East and North Africa region experiencing challenges with its economy, as it imports a significant share of its food and energy. The import of food is closely linked to an insufficient supply of water and arable land for cultivation. Its wells are over-exploited and about half of its scarce fresh and groundwater resources are used for irrigation in producing vegetables; some of which are exported outside the country. Although arguments have arisen that the subsidies on water only benefit a selected few; the producers, instead of the general population. Furthermore, the water sector builds its foundation on energy which is used in water facilities for pumping water at an average of 4.31kWh per m<sup>3</sup> of pumped water, even though about half of the water available for domestic use is lost as non-revenue water

due to inefficiencies. In addition to the highly volatile energy sector which is dependent on the ever-fluctuating fossil fuels prices. Despite all the challenges in Jordan, the government has developed policies and international collaborations programs to provide basic amenities to meet its inhabitants' demands towards building a green economy through its policies. The United Nations defines a green economy as one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities which infers that such an economy incorporates the three pillars of sustainable development: people, planet and profit. This paper outlines the current scenario of the water agriculture, and energy sectors establishing Jordan's water-food-energy dependencies and its effect on human activities and the environment. It analyses resource management policies and future targets by the government highlighting externalities such as the value placed on water and failed attempts of subsidy removals in the energy sector over the years. Also exploring pilot projects and practices oriented to the welfare of its people such as the water wise women initiative. The aquaponics technology is introduced as a system which could potentially increase the efficient use of water for enhanced food security and lead to a reduction in the energy required. Finally, this paper presents overlapping and contradicting policies which should be addressed and recommendations to maintain and improve the progress in Jordan so far.

## Public-Private Partnership in Energy Efficiency Projects; A Case Study of the Municipality of Milan

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### **Abstract:**

Tackling poverty and climate change has become a struggle for international community. Undeniably, the root of these problems should be found in the energy sector. Energy, along with its sources, are necessary elements to provide human beings with a prosperous and dignified life. energy management through energy efficiency at demand/supply chain will reduce energy consumption, GHG emissions, costs as well as it allows economic development through the improvement of profitability, lowering States' dependency, and enhancement of energy accessibility.

Under the pressure of international, regional and local regulations, energy efficiency has become the integral part of States' policies. In many Countries, the adoption of energy efficiency policies has resulted in the accomplishment of low-cost-consumption reductions without the sacrifice of equity and social equality values. In order to be effective, energy efficiency must be contained in specific sectors of intervention, such as construction, services, education. However, public administrations cannot be the sole protagonist of the needed regulatory and behavioral change.

Private parties are more relevant in the pursuit of social goals, as the spreading of public private partnerships (PPP) worldwide demonstrates. As a matter of fact, PPPs can be extremely beneficial for energy efficiency policies, since it better allocates risks, stimulates innovation and brings about fair economic rewards, higher accountability and the enhancement of social and environmental standards.

One of the most common instruments of cooperation for the reduction of energy use and energy efficiency is the engagement of Energy Performance Contracts (EPC) by Energy Service Companies (ESCOs). Yet, recently some scholars and administrators have doubted about the efficacy of the instrument in reaching, in short terms, energy efficiency goals, trying to develop new forms of collaboration between public administrations and private parties. In this sense, some interesting examples of progressive PPP have been adopted in Italy by the Municipality of Milan.

On this premises, this paper briefly explains the 2030 Agenda, and Goal 7 and 17. It shed light on these two goals, states obligation by 2030 and their importance. After a clarification of the concepts of EE and PPP, it will discuss the relevant international, European and Italian legal framework. Subsequently, Energy Service Companies will be assessed to reveal whether they could positively be involved in energy efficiency or their drawbacks impede them from being considered a solution to play a role in EE game. Lastly, the elements of Municipality of Milan's project will be examined to provide the best practice of PPP projects in the energy sector.

## Empowering electricity deprived countries with the technology, knowhow and wherewithal to manufacture renewable energy solutions

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### **Abstract:**

A PRACTICAL BREAK-THE-MOLD PARADIGM SHIFT

The practical strategy proposed herein is tailored to stop the endless cycle of providing underdeveloped countries with imported distributed energy solutions which tend to only function until the first maintenance issue arises at which time they are often discarded. This

strategy establishes a domestically controlled 100% renewable energy industry that delivers energy to those who would otherwise be denied electrical access for decades.

#### CHALLENGES NON-CONVENTIONAL SOLUTION

- 1) Power to the people Providing electricity to where the people are located
- 2) Reduce hunger Electricity for irrigation, food processing and preservation
- 3) Improve health Electricity for medical care services
- 4) Gender equality Eliminate the gathering of domestic use dung/wood/biomass
- 5) Clean water & sanitation Electricity to bore wells, pump, treat and or store water
- 6) Affordable clean energy Solar, wind, storage & distribution in a self-contained system
- 7) Work & economic growth Create new high value jobs for men and women
- 8) Industry innovation Transfer technology, training & management
- 9) Sustainable cities Provide core electricity for villages, farmland and enterprise
- 10) Climate action 100% domestically made completely renewable energy

A key indicative historical precedent that depicts the highly valuable quality of life aspect of electrical proliferation can be easily summarized by the industrial development of the USA during the early 20th century. For example, in 1910 only 10% of US households had electricity, in sharp contrast by 1918 33% of US households were serviced by electricity and by 1931 85% of US households enjoyed the benefits of electricity. During that time span the US went from utilizing ice boxes to refrigerators and industrial growth was able to expand from riverside mills to inland factories that were serviced by electricity that powered the manufacturing machines.

The unique and self-fulfilling aspect of this transformative strategy is to empower those countries who have the greatest need for electricity with the technology, knowhow, resources and guidance to resolve their immediate need for electricity by establishing a domestic manufacturing, deployment, maintenance and administration industrial infrastructure that creates a large number of high value jobs for men and women on a nationwide basis.

The ecological benefits are garnered through the clean energy aspects of home-made 100% pollution free renewable energy solar and wind systems. The social benefits are the capacity for improved education, nutrition, health care, social wellbeing, agricultural development and

sanitation. Furthermore, the remote site deployment of solar, wind, storage and distribution systems deliver the ability to transform large expanses of underutilized land into productive farmland by providing the electricity that can be used to bore wells and to pump water for agricultural irrigation, livestock and for the storage and treatment of household water and for sanitation needs.

The economic benefits of this strategy encompass a wide swath of the population beginning with the creation of highly valuable manufacturing, deployment, operation, maintenance and administrative jobs for both men and women that are created by the underlying domestic renewable energy industrial development. Locally, the short-term economic benefits manifest themselves as increased agricultural production, processing and preservation of food stocks that can be stored for future sale.

Moreover, the greater and longer-term economic benefits are garnered from education of the young that can transform and improve their lives and those of their families as a result of an enhanced level of education and the related social development and mobility that results from same education.

## Intrinsic and Extrinsic factors affecting milk yield and composition of Camel milk in Northern Eritrea

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### **Abstract:**

Although camel milk contribute rich dietary to the people living in Eritrea lowlands, studies in factors affecting its yield and composition have not yet been studied. Hence, the objectives of our study was to investigate effects of Extrinsic factors ( season) and Intrinsic factors ( stage of lactation and parity) on the its yield and composition, of camels kept under traditional management systems in northern semi arid of Eritrea. We have collected 300 random milk samples from January to October, 30 samples each month, in 2017. The analysis of milk composition was done using Mid Infrared Transmission Spectroscopy (MIRIS), an automated Milk Analyzer system, and the obtained data was analyzed using general linear model SPSS 18. The average daily yield of and composition of fat, protein, and lactose were 3.78 liters, 2.43%, 2.71%, 4.8% respectively. Stage of lactation, parity and season of the year had significant ( $P < 0.05$ ) effects on daily milk yield, composition of fat, protein. The percentage composition of lactose remained unaffected by all variables considered. The percentage composition of

lactose remained unaffected by all variables considered. The highest average daily milk yield was recorded at 2nd month of lactation ( $4.04 \pm 0.10$  liters), whereas the least was after 8 months of lactation. The daily milk was significantly higher at 3rd month period. The percentage compositions of fat and protein were also the highest during the first 3 months of lactation

period ( $3.21 \pm 0.14$  and  $2.76 \pm 0.11$ , respectively). Similarly, the highest average daily milk yield and percentage composition of protein, fat and dry matter were recorded from camels of 3rd parity ( $4.43 \pm 0.2$  liters,  $5.11 \pm 0.51$ , and  $3.19 \pm 0.22$ , respectively). This study revealed that camels are reliable sources of milk with persistent yield and composition throughout most periods of lactation. Effective herd management of selection and culling and supplemental feeds during the dry seasons may contribute to high quality camel milk in the region.

## The WABA project: Wastewater Bioremediation using Algae-Bacteria consortia for rural Areas

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### **Abstract:**

Wastewater treatment in rural areas is often performed by constructed wetlands or reed bed systems. These processes are not as effective as the activated sludge systems. In a review including data from 7 countries, these systems have country-average COD removal efficiency between 64.33% and 93.3% as well as country-average total phosphorus removal efficiency between 26.73% and 88.2% (Babatunde and Zhao, 2007). These figures need to be improved,

especially in the Mediterranean region that hosts over 50% of the world's water poor populations, around 180 million people (IPEMED, 2018). Countries in the Middle-East and North Africa (MENA) region like Algeria, Egypt, Jordan, Lebanon, Morocco and Tunisia have a total renewable water resource below 1000 m<sup>3</sup>/inhab/y which corresponds to water scarcity (in comparison to 35,000 m<sup>3</sup>/inhab/y for Australia and New Zealand for example (IPEMED, 2018). Moreover, these figures are expected to decrease over the years due to climate change and may rapidly evolve below the absolute scarcity level of 460 m<sup>3</sup>/inhab/y (Al Baz et al., 2016).

The potential of microalgae for bioremediation has recently received considerable interest (Gabriel Acien et al., 2016). Indeed, microalgae can effectively remediate the mineral pollutants and part of the organic pollutants of a broad range of wastewaters from the domestic, industrial and agricultural sectors (Delrue et al., 2016). Moreover, polysaccharides from microalgae biomass can result in a promising resource of plant biostimulants (Farid et al., 2018).

Considering all these applications, the implementation of wastewater bioremediation process in the rural Mediterranean region has been identified as an opportunity to meet the United Nations Sustainable Development Goals (SDGs) and reduce the territorial asymmetries (Rastoin, 2016). Indeed, in a context of transition from an economy based on fossil resources towards a “circular and territorialised bioeconomy”, it may provide adapted and innovative solutions to major social, economic and environmental issues (Rastoin, 2016), by taking advantage of the assets of the region (exceptional insolation, significant sea and lagoon surfaces, etc.). But the existing literature did not establish the socio-economic feasibility of the wastewater bioremediation process yet (Rastoin, 2016).

Therefore, the WABA project principal goal is to develop an alternative eco-friendly and sustainable wastewater treatment process dedicated to rural areas in the Mediterranean region. The process is based on a microalgae-bacteria consortium cultivated in a low-cost raceway system and harvested by coagulation-flocculation. The biomass produced during the process is being used as a plant biostimulant. Finally, the social, economic and ecological impacts of the WABA project is being studied through two case studies (France and Morocco) and a survey conducted among wastewater treatment in specific rural areas.

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## Ground Water Quality Study in Coastal Area Of Visakhapatnam, Andhra Pradesh Using Ionic Ratios And Water Quality Index

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### **Abstract:**

The quality of groundwater depends upon a number of factors such as general geology, the degree of chemical weathering of various types of rock, water quality replenishment and inputs from various sources of water-rock interaction. Water quality assessment in the coastal area of Visakhapatnam, Andhra Pradesh, India was conducted in November 2014 and April 2015. In this study, the physicochemical characteristics determine groundwater for drinking and domestic use. Conventional hydrochemical techniques, ion ratios, water quality rate and statistical analysis have been applied to examine ion chemistry and major groundwater hydrochemical processes. Basic physicochemical characteristics analyzed for twenty groundwater samples collected in two seasons. The predominance of anions and cations were in the order of Cl<sup>-</sup>→

HCO<sub>3</sub><sup>-</sup> > SO<sub>4</sub><sup>2-</sup> > NO<sub>3</sub><sup>-</sup> and Na<sup>+</sup> > Ca<sup>2+</sup> > Mg<sup>2+</sup> > K<sup>+</sup>. Groundwater contaminated by salinity showed high levels of TDS, Na<sup>+</sup>, Ca<sup>2+</sup>, Cl<sup>-</sup>, which are the simplest common indicators for the intrusion of seawater. The major chemical ionic ratio (Ca<sup>2+</sup>/Mg<sup>2+</sup>, Na<sup>+</sup>/Cl<sup>-</sup>, Ca<sup>2+</sup>/SO<sub>4</sub><sup>2-</sup>+HCO<sub>3</sub><sup>-</sup>, Cl<sup>-</sup>/HCO<sub>3</sub><sup>-</sup>) was used to delineate saline water intrusion. The values of WQI have been affected mainly by the Concentration of dissolved ions in groundwater and the observed WQI value samples were found in the range of 35-87% in pre-monsoon while it was 24-64% in the post-monsoon season. These detailed parameters of groundwater analysis indicated a possible threat of saltwater intrusion into groundwater near the coastline. It revealed that precautionary measures must be taken to protect the quality of water.

## Social cost comparative analysis to derive an optimal energy mix plan in India; Current Hurdles and Future Planning

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### Abstract:

Currently, in India the contribution of fossil fuels in the energy mix is 81.9% (2018). India's trade deficit has been -108.5 billion USD (2017) while its import of oil and coal itself was worth 108.1 billion USD (2017). Such heavy reliance on imported fossil fuels for electricity generation, transportation fuel and process heat is clearly worsening India's trade deficit and is apparently the main cause behind the depreciating rupee. Additionally, India emits 2055 million tonnes of carbon dioxide (2017) yearly which is quite an alarming fact given India's carbon emission goals. On the other hand, India's Nuclear Power Program is ready to fully meet the energy demand of transportation fuel, drinking water (through desalination), base-load electricity and process heat for industries with the least carbon footprint, for centuries. Moreover, the river-interlinking project of India with canal-top solar power plants, backed-up with pumped-storage hydroelectricity stations, can fully meet the irrigation and electricity demand in the agriculture sector. It is a well-known fact that Human Development Index (HDI) is statistically correlated with the per-capita electricity consumption. HDI (2018) for India is 0.639 and the per-capita electricity consumption is 1149 kWh which is well-below the world average of 3000 kWh. India has had an ambitious plan to generate 5000 kWh per-capita. To achieve this in a sustainable manner, in this report, we have derived and compared the actual social cost of generating electricity from different sources of electricity generation in India taking into account factors like green house gas emissions, levelized cost of electricity (LCOE), fatalities and land

requirement. Through our study, Nuclear, Solar and Biogas comes out to be the best 3 sources having the least social cost (in increasing order). Additionally, we have proposed a town level planning for the installation of these 3 sources for the state of Rajasthan. India with its indigenous Nuclear Energy program itself can generate 3000 kWh per capita for the next 900 years.

We will also explore the 2 scenarios in Japan & Germany respectively and discover that the Government only with a strong - reliable & sustainable growth target having an unbiased approach to Energy policy and backed up with the required support from the aware citizens tries to achieve the desired targets of the economy.

We hope, our analysis will help India (a multi-party democratic country) derive a socially viable energy plan. We will also show how the currently dead Nuclear Power Plant sites like 6600 MW Mithivirdi (Gujarat), 9900 MW Haripur (West Bengal), 8000 MW Kudankulam (Tamil Nadu), 6600 MW Kovvada (Andhra Pradesh), 6000 MW Markandi (Orissa) and other Pressurized Heavy Water Reactors, Fast Breeder Reactors & Advanced Heavy Water Reactors can be immediately brought back to commercial operation or construction with pre-project awareness activities (through an unbiased extension network) in the regional public and right evaluation of compensation money in time.

## Environmental effects of inorganic fertilizers use on agricultural lands in Nigeria

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### **Abstract:**

Declining soil fertility has been identified as one of the important factors responsible for the slow growth rate in food production in Nigeria. Inorganic fertilizers use is recognized as an important external input that can improve crop yields and salvage this ugly situation in Nigeria and other developing countries of the world. Inorganic fertilizers have been the pivot of several green revolution programmes in different parts of the world. They have been recognized for their effectiveness in making needed minerals available to cultivated crops. In spite of the beneficial effects of inorganic fertilizers, they also come with adverse consequences such as economic waste due to leaching, pollution of underground water, burning of plant roots among others. The study will cover Nigeria, West Africa which has a tropical climate and a huge agricultural population. This study seeks to investigate the beneficial and harmful environmental effects of fertilizer use in Nigeria, with a view to striking a good balance. The study will rely on secondary data sources from the Federal Ministry of Agriculture, National Bureau of Statistics, Nigeria, FAOSTAT to obtain information on inorganic fertilizer use, in terms of type, quantity, quality, and harmful environmental consequences. Descriptive analysis will be

employed to describe the data while a critical review of literature will be undertaken to have a deep understanding of the environmental consequences of fertilizer use. The expected results will provide deep insight into the use of inorganic fertilizers and help in the design of policies and programmes that will inform responsible and sustainable use of inorganic fertilizer so as to maintain the integrity of the ecosystem. It will also lead to better use of inorganic fertilizers to improve agricultural productivity, income from agricultural production and improvement in the welfare of farmers in Nigeria.

## Water as agent: ecological and cultural interdependencies in Bamyan, Afghanistan

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### **Abstract:**

In the aftermath of conflict, water is vital not only to sustain human life, but plays a critical role in restoring economic livelihoods and alleviating poverty over the long term. Particularly in countries lacking stability such as Afghanistan – where water has both ecological and cultural implications – security in the water-resource base can support overall ecosystem health and promote self-sufficiency of local communities.

Bamyan is a small, rapidly-urbanizing valley in the Central Highlands of Afghanistan, known best for its historic archaeological sites which have been the major drivers for international peacebuilding action there. Despite the resulting volume of development initiatives, inadequate and inappropriate development of water infrastructure, especially as Bamyan transitions to an important urban centre in the province, threatens the valley's limited water resources, provoking traditional rural lifestyles, and questioning water allocations for food, economy, and people. When water management in Bamyan has historically been reliant upon the strength of and within local communities, engineered infrastructural solutions from aid agencies break intrinsic ecological and cultural relationships between land, water, and people.

Water scarcity in Bamyan is largely an issue of inefficiency and poor management. Development solutions in the water sector aggravate this issue by focusing on immediate needs of supply management such as water access or flood prevention without considering the larger water network, traditional systems of management, or, most importantly, resulting ecological, social, and cultural implications. For example, uncontrolled application of water access through simple bore-hole wells without appropriate consideration of well placement provides access to water in the short-term, but dries out traditional wells and depletes long-term ground-water supply. Further, the disappearance of private spaces for water collection reduces existing social networks, especially for women. In turn, this limits opportunities for informal community gathering, dialogue, and decision-making, with significant consequence for sustainable, community-based peace processes.

Through a spatial analysis of current development interventions and their shortcomings, this

paper explores the potential of water to cultivate relationships of solidarity, between and among communities, acknowledging cultural and ecological interdependencies. Specifically, by connecting water and women as mechanisms for 'positive' peace, the paper posits a framework for sustainable development that is grounded in local conditions and livelihoods. The paper suggests that sustainable, community-based management of water resources, within the framework of a watershed ecosystem, can be a mechanism for conflict prevention and peacebuilding, a means of rebuilding both environmental and social resilience in Bamyan. By drawing on existing ecological conditions and essential social mechanisms, this paper ultimately points toward a methodology for appropriately addressing root causes of insecurity in unstable environments.

## Colorimetric Urea-Based Sensors for Anionic Contaminants in Water

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### **Abstract:**

Sustainable identification of chemical contaminants in water is a need many are facing around the world today. While purification systems for impurities are common in the marketplace, the resources used for detecting chemical contaminants often produce waste and are unsustainable for many in the developing world. This research aims to create a visible sensor for chemical contaminants in water based on the hydrogen bonding interactions with the compound urea. This is important because it allows for efficient testing of water to check for these contaminations in a cheap, efficient way. The implications of this research extend into many different arenas of sustainable development including health, agriculture, and water development. Many of the common chemical contaminants in water supply are linked to agricultural run-off. This research used computational chemistry methods to analyze colorimetric anionic receptors that may aid in the identification of common contaminants in water that come from agricultural runoff. Using the computational chemistry software program Gaussian 16, the goal of this research is the nature of interactions between color changing urea-based molecules and negatively charge chemical contaminates in water. Computational methods allow for the study of these interactions, which are difficult to research without the use of simulation due to the reactivity of the anions and cost of synthesis materials. These interactions are selective for specific types of chemical contaminants. A series of five of urea-based molecules with colorimetric fragments were studied in order to more carefully understand their interactions with common halides found in water—fluoride, chloride, and bromide. The fragments studied not only have colorimetric properties but also increase the interaction energy between urea and anionic contaminants, causing the anion to interact with urea instead of water. Using time-dependent density functional theory methods (TD-DFT) in Gaussian 16, this research is focused on doing the foundational calculations that test the interaction strength of urea with the colorimetric sensor in order to have an optimized structure to compare with current models in order to improve synthesis in the future. TD-DFT methods were used to calculate the change in visible light absorbance when these fragments

are interacting with anionic contaminants. These calculations support predictions of color change in these models and aim to help with synthesis of better sensors for chemical contaminants in the future. The ability to tell if water is contaminated through color change helps to reduce the amount of testing and gives immediate results when chemical contaminants are present in water.

## Sewage Treatment Plants in universities as a tool of education, research and sustainable development

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### **Abstract:**

In Natal, Rio Grande do Norte, Brazil, the Federal University of Rio Grande do Norte - UFRN presents a commitment to the Sustainable Development Goals (SDGs). This theme was explored by Rezende (2018) during ICSD 2018. This present research studied Federal University of Rio Grande do Norte - UFRN Sewage Treatment Plant (Estação de Tratamento de Esgoto - ETE). This initiative it is presented as a sustainable practice linking Water, Energy, and Agriculture and deeply connected to Goal 6 – Clean Water and Sanitation.

This research evaluated the technical process of operation of Sewage Treatment Plant, also observing the strategic implications linked to Sustainable Development Goals.

Observing the operation of Sewage Treatment Plant, all the waste water produced on the campus is transported through pipelines to a treatment plant and when arriving at this station it passes initially through the preliminary treatment, where heavy particles such as plastics and sand are collected, followed by a secondary process, where the organic materials are removed and solids in a pool where water is exposed to aerobic bacteria.

Following, the waste water moves towards the decanter, where the disposable solids are suspended due to the force of gravity, while is concentrated below. Next, operates the biological filter, serving as a sieve, preventing small particles to go to the next step, which is chlorination, where chlorine is added.

After all these processes the water is destined for the irrigation of the soccer field, located in

the own campus, generating savings to the University and preserving the environment, since the discarded water was treated in the station, not having environmental consequences. Water is also used for gardening.

UFRN Sewage Treatment Plant is a space for sustainable education, promoting the awareness about the reuse of sewage, receiving groups of professors and students from different areas and institutions. UFRN Sewage Treatment Plant is also visited by other universities from other states interested in develop their own systems of sewage treatment.

Federal University of Rio Grande do Norte - UFRN is an institution of 43,000 students, 5,500 professors and more than 200 bachelor courses. Looks very important promotes the Sewage Treatment Plant as an example of sustainable practice.

## The vulnerability of rural communities in Uzbekistan to the adverse effects of climate change on agriculture

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**Abstract:**

The availability of 90% water resources in Uzbekistan depends on over the border water allocation by two main river basins Amudarya and Syrdarya headwatering from triangle of Tien Shan, Pamir and Hindu Kush mountains. Uzbekistan is fast growing country with annual 1.7% population growth and 17% share of agriculture in Gross Domestic Product. The possible water stress impact of climate change to the agricultural production in country is well stated in academia. The aim of this study was to quantify several uncertain local social data and release for discussion the possible mitigation practices. Therefore, this study was conducted to map interconnected realities: the vulnerability of farmers and their families to the agriculture as means of living and possible policy solutions. This study was conducted in one of the most agricultural productive regions in Tashkent province, the upstream water consumer of Chirchik river. The socio-economic data from sampled fifty households were surveyed including their household members of total 290 people. It was found out that 78% of head of families and 44% of their family members are occupied in agriculture. Other main clusters were government occupations (12%), retirees (12%) and housewives (18%). 17.03% of them have university degree and 3% are undergraduate students. From main findings it can be stated that the communities in the study areas of Tashkent province, mainly dependent to the agriculture with limited option to alternate their occupation due to their academic background. The study is giving analytical evidences on adverse effects of water shortage to the agriculture dependent population, livelihoods of whom rely only to agricultural production. Further it was discussed



the possible mitigation policy options and worldwide practices. The outcome of this research will be interesting to the policy makers, the researchers interested in the social aspects of climate policy, and to the farmers for forward-thinking.

## Regulatory and Policy Options to Promote Energy Efficiency in Brazil

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### **Abstract:**

The current agenda in the field of environmental preservation policies emphasizes the rational use of energy and the adoption of a conservation mechanism assembled in guidelines of energy efficiency and sustainable development. The Brazilian Energy Efficiency Plan rises on that scenario inspired by national energy conservation programs and putting into practice measures of the National Energy Plan 2030, which demonstrates the potential of applying efficiency measures in Brazil in several sectors, such as in industry, transportation, buildings, lighting and agriculture, in a long-term planning, and from an integrated perspective of available resources. This paper aims to analyze the compliance of legal and political mechanisms to promoting energy efficiency in Brazil, starting from the premise that the State has the duty to developing instruments that guarantee the efficient allocation of energy resources and environmental preservation. In a context of a serious water crisis and a feasible energy crisis, there is a need to exploring renewable energy sources, taking into account the dependence on hydroelectric generation in Brazil, and the high cost of producing thermoelectric energy as a possible source for crisis. It is necessary to give a new meaning to the right to energy efficiency in Brazil, both through legislative updating (the main legal framework on the theme dates back to 2001 – Law 10.295/2001), as well as through the practical manifestation of effective public policies that directly involve the society in its implementation, on a perspective of public governance.

## Good Practices in Climate Change Mitigation, Adaptation, and Resilience

Driving positive SDG impact: Developing credible ways to measure a company's positive impact on the SDGs - the case of the ROCKWOOL Group

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**Abstract:**

In order for companies to be able to track and communicate progress on the SDGs, it is important that there are credible ways by which they can measure this progress both in terms of minimizing negative operational impacts and maximizing positive impacts through their products. Developing credible methodologies for measuring the positive impacts of products can be challenging due to the lack of accepted standardized approaches.

ROCKWOOL has made a commitment to drive an increased positive contribution to 10 UN Sustainable Development Goals (SDGs). In ROCKWOOL the SDG performance is evaluated in two different ways: based on the effects of our products as well as the operational impacts. The performance is tracked through a combination of sustainability goals and product impact metrics where possible.

The purpose of this paper is to introduce in detail the methodology and the approaches followed for the quantification of the SDGs for both the operational impacts and the effects of the products and serve as inspiration for other companies and organisations committed towards SDGs.

For the part of operational impacts, ROCKWOOL has set 6 ambitious sustainability goals for 2030. One of them relates to a commitment to decarbonize its production by applying an LCA approach and finding the relevant hotspots through the whole manufacturing chain. On example of an initiative was the conversion of the coke fired furnace facility in Norway to a pilot electrical melter powered by energy from renewable sources. This will reduce CO<sub>2</sub> emissions from the factory by 80%, creating a more climate and environment-friendly production. Two other goals related to strengthening the company's circular business model. An example here, is ROCKWOOL's commitment to increase the amount of used products being recycled by offering dedicated recycling schemes in 30 countries by 2030.

In relation to the positive impacts of its products, ROCKWOOL has worked with a number of different external partners to develop specific methodologies to measure the impact on the SDGs. More specifically, ROCKWOOL together with Navigant Aps created a dynamic tool for the quantification of the avoided emissions due to proper insulation of buildings and used this as a basis to communicate and measure the company commitment to SDG 13 about climate change. In addition, Wageningen University in The Netherlands assisted in quantifying land use reduction, yield gain, fertilizer and water saved by our hydroponic horticulture solution, GRODAN, compared to common soil based cultivation contributing to SDGs 2 and 6. Finally, together with Rambøll Denmark, a methodology to assess the impact from installed Rockfon acoustical ceilings on students' learning and performance was developed contributing to SDG 3- Good Health and Well-being.

On top of this, innovative solutions which have a significant contribution towards sustainability have also been launched. With Rockzero, a new innovative wall system, a reduction of 20% of the embodied carbon is achieved, while Rockflow, an innovative water management system, is able to absorb 95% of its volume in water, which can help in reducing the effects of heavy rain and flooding in urban areas.

## **Towards a More Comprehensive Conceptual Foundation for Institutional Capacity Assessment within Climate Change Governance Research — A Literature Review**

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### **Abstract:**

The ever-changing climate suggests the need for transformative approaches to governing sustainability. However, significant gaps still exist in the identification, evaluation, and communication of transformational indicators, and in linking such indicators to current forest governance initiatives. To address the lacunae in the current scholarship of institutional analysis, we rely on an inductive logic approach to integrate three strands of theories: policy coherence, institutional capacity, and transformational change. Following, we propose a novel conceptual framework: institutional capacity for transformative governance, reflecting changing approaches in institutional analysis. Our proposed framework consists of two primary components: policy coherence and institutional capacity. We argue that transformative governance rest upon well-established institutions and innovative ideas, however, the emphasis has widely been placed on policy capacities, to develop and implement coherent policies that affect the larger goal of sustainable forestry. Our integrated framework that may aid empirical research in two ways. First, it highlights a useful analytical guide to practically engage the multitude of actors with competing claims and objectively applies their viewpoints to address forest governance challenges. Second, it underlines the need for policymakers to consider levers of transformational change along with capacity development. Since one lever of the transformative model cannot determine the effectiveness of institutions but may have an effect on actors' systemic capabilities, policymakers need to develop capacity strategies that consider all the variables. Such systematic capacities regarding transformative forest governance should be developed through policy learning and research by operationalizing and communicating how specific transformational outcomes result from identified best practices.

## Multi-Dimensional Approaches in Sri Lanka: National Policy on Disaster Management in Action

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### **Abstract:**

On account of climate change, global warming and rapid and growing urbanization human civilizations are mostly experiencing the disasters. Currently, the biggest threat to the poor, developing and middle-income economies is the disaster because latterly we have seen that the impact of any particular disaster spread over a particular country, not being present in different countries at the same time. And that's why regional cooperation is still not fully operational. Of late, one of the important South Asian countries- Sri Lanka has experienced several natural disasters i.e. floods, cyclones, droughts, landslides, lightning, coastal erosion, earthquake, and Tsunami which is considering as the biggest impediment for the country's economic development and growth path. Sri Lanka's overall development is imitative and exemplary for the regional countries in terms of human development index, education, and healthcare but unfortunately, these achievements are fading due to the disasters. The poor, developing and middle-income countries want to get the long-term resilience with investing a minimum to counter the disaster, which is also permeable by their own economy. But the 2004 Tsunami has taught everyone related to disaster management. But the catastrophic Tsunami of 2004 obligate the concerning authorities of Sri Lanka rethink about the disaster management and disaster resilience. As an effective measure and operational instrument soon after Tsunami, in 2005 Sri Lankan government has adopted Disaster Management Act and later on in 2010 formulated National Policy of Disaster Management to integrate all government, non-government, private, civil society and international communities.

This current study had focused on how the multi-dimensional national disaster management policy is implementing disaster risk reduction operations in Sri Lanka before and after any event of disasters.

Key Words: Disaster Resilience, National Policy, Multi-Dimensions, Policy Actions, Multi-Stakeholders, Multi-Sectors, Multi-Phases.

## Legal Stipulations as Panacea for Climate Change Success

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**Abstract:**

The reluctance of some African states to take urgent actions to combat climate change effects and impacts\* in the face of depleting ozone layer is depicted by a serving Nigerian senator. He sponsored a bill informing the senate that combustion cars were causing pollution which contributes to the effects of global warming. Hence, there is a need to gradually eliminate the use of combustion cars in Nigeria and the rest of the world. The bill that sought to phase out the use of petrol cars and replace them with electric cars in Nigeria by the year 2035 was rejected by the Senate on Wednesday 17th April 2019. A usable weather parameter for determining climate change is the excessive rainfall experiences in Nigeria which forecasts an impossible end to hunger and achievement of food security; since the social and economic development of West Africa countries is strongly linked to agricultural and water resources. In the last few years, alteration of periods with extreme rainfall or dry spells has led to a succession of flood and drought years. These extreme events constitute the primary impact of climate change on society since their occurrence have more impact on the livelihood of mankind. The research opined that climate change should now go beyond an abstract academic study; it has to be a daily concern with stipulated actions for offenders. With the reality of the gross effects of climate change, the research focused on the necessity for instituting legal stipulations, policies and enforcement which would serve as panacea to climate change success, guiding nations in achieving desired climate change resilience.

The study used descriptive survey research design; purposive sampling technique was used to draw respondents that participated in the study. The study relied extensively on both primary and secondary sources of data. The former included: five In-depth Interviews that were conducted in both Oyo State House of Assembly and the National Assembly. One hundred copies of questionnaire were used to collect data across Climate change enthusiast. The secondary data were: books, journals, online materials and newspaper articles on the research discourse.

The study discovered that Climate Change cuts across all sectors. As drought persists, intense rains are claiming lives, destroying properties and crops in many parts of Nigeria. It also discovered that strict integration of climate change legal stipulations and policies into the exercise of power and functions of all levels of governance, and enhancing cooperative climate change governance would ensure compliance. It also points out that promoting low carbon technologies would improve efficiency, reduce emissions intensity and improve climate condition.

The research recommended that anyone found guilty of committing an offense — such as failing to comply with targets — could be fined, because climate change is now a serious part of our lives.

## Importance of Climate Justice in Developing Countries.

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### **Abstract:**

According to IPCC's Fifth Assessment Report, climate change will increase existing risks as well as creating new risks for natural and human systems; furthermore, these risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development. In that context, climate justice concept and its mechanism practice may contribute to reducing the existing risks. Because it examines the unequal impacts of climate change on the poorest and those least capable and seeks to combine the climate change discussion with human rights in a way that is equitable for the most climate-vulnerable groups. Climate justice is so important in developing countries. Developing countries, particularly those most vulnerable to climate change effects, suffer from a lack of resources to implement the necessary adaptation measures. They have low resilience when faced with natural disasters such as flooding, cyclone, storm surge, etc.; at the same time, they have the least funds to invest. The UNFCCC agreed that industrialized countries will provide financial support and transfer technology to developing countries to support climate change mitigation, and the Kyoto Protocol further develops this concept by creating a mitigation instrument known as clean development CDM). Mitigation has enjoyed more attention than adaptation, but the cost of adaptation will be higher for low-income countries. Adaptation must be taken as seriously as mitigation by policy-makers. While adaptation measures are in high demand in some developing countries; Bangladesh is one such country. The technical aspects of adaptation need to be more flexible and incorporate a development-based approach. There needs to be an emphasis on capacity building and institutional strengthening, and a focus on low-carbon technologies. There should also be an emphasis on long-term adaptation action planning to avoid the worst climate impacts, such as those from rising temperatures and rising sea levels. In order to promote climate justice, need to formulate a high-level national climate change policy that prioritizes adaptation measures with long-term objectives as a first step to introducing climate change-specific legislation in climate vulnerable developing countries.

## Walking the Talk: Nigeria's Green Bond Towards Sustainable Development Pledge

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**Abstract:**

With almost four years into the ultimatum set for the attainment of the fifteen-year bound Sustainable Development Goals (SDGs), the place of sustainable financing cannot be overemphasized, considering its potentials in achieving progressive, sustainable, multi-sectoral and multi-faceted societal growth. However, efforts by nations to set aside dedicated funds for this purpose are still evolving, thereby; suggesting that much is still required if the key deliverables enumerated in the global goals are to be actualized by the year 2030. Meanwhile, Green Bond has been identified as one of the viable options with the prospects of low risk, fixed regular income, tradability, tax savings and capital appreciation on green investments.

With the Global Green Bond (GGB) up to the tune of \$167.3 Billion in 2018, 47% of which are held by the United States, China and France, Africa as a whole, has been less visible in this movement. Meanwhile, as a right step in the right direction, Nigeria joined the league of nations with Green Bond, making her the first nation in Africa to have Green Bond. In December 2018, the Nigerian government raised \$10.97 Billion Green Bond for the purpose of financing her solar energy drive. Only recently, another \$15 Billion Green Bond was launched to finance the agriculture, power, health and water resources. The private sector led by Access Bank also successfully raised over \$41,000.000 Green Bond with the objectives of granting new loans and refinancing existing loans in accordance with the bank's Green Bond Framework while also supporting projects directed at flood defense, solar generation facilities, and agriculture.

The study employed doctrinal research approach. It reviewed existing literature, appraised the policy of the government and analyzed the Green Bond initiatives of the government and organized private sector in line with global best practices.

While this study posits that Nigeria's leading role is exemplary of government proactive step as well as private sector involvement. The study however raises concerns as to the manner that the funds realized from the investment is to be managed considering the failure of the past administrations in ensuring transparent and prudent utilization of public funds to the common good of the people. The private sector is not left behind in this web of corruption, as some former bank's CEO still have corruption charges hanging on their necks. Similarly, there are other issues regarding the unfriendly investment climate and the future of these investments, the lending rate and other militating factors. This research concludes with recommendations on how to ensure transparent and profitable management of the investments.

## **Harnessing Flare Gas For Cleaner Energy Solutions In Nigeria.**

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**Abstract:**

In this paper we validate quantitative data from Department of Petroleum Resources (DPR) and Nigeria Gas Company (NGC) that Nigeria with approximately 200 tscf proven and 600 tscf unproven gas reserves; the ninth largest in the world produced over 7 bscf per day as associated and non-associated gas. Reviewed documents revealed that over a billion scf of associated gas produced is flared daily due to inadequate production infrastructures. We establish that an attractive means to reduce emission of over 30 million tonnes of CO<sub>2</sub> into the atmosphere daily is to convert flaring to utilization. This study identified gas field sizes, matured technology, capital and effective evacuation plans amongst other as factors needed to compress (CNG), liquefy (LPG) and transform these gases to various sustainable domestic or international usages. Other identified transformation technologies include gas to ammonia and urea; gas to liquid; gas to methanol and modular gas to power. Adequate data was provided in this paper for both National and international investors on the newly established 'Nigerian Gas Flare Commercialization Programme' (NGFCP). It further provides an insight to the political support through the recently enactment "Flare gas (Prevention of waste and pollution) Regulations 2018". It is equally a call to attract financially and technologically qualified third party investors to partner with operators in over 178 flare sites; onshore and offshore Niger Delta to harness the flare gas through commercially viable utilization options. The country can aggregate over 2.5 gigawatts (Gw) daily of affordable, cleaner and healthier electricity from over 350 bscf of gas flared annually. This is equivalent to \$400 million carbon credit and can attract over \$4 billion investment, reduce climate change impacts from flaring, and provide over 300,000 jobs in the rural oil rich communities to stimulate the ailing economy and reduce poverty thereby reducing insecurity in the Niger Delta. Renewable energy sources were identified to play a strategic role in powering future global economy, but this study established that fossil fuel will provide a dominant source of energy needed by the developing nations of the world to meet their immediate and near future needs, therefore the need to harness it for sustainable development goals.

Keywords:

Associated gas; CO<sub>2</sub> emission; Flare gas; Fossil fuel; Gas reserves; Gigawatt; Modular; Offshore; Onshore; Pollution; Poverty; Renewable energy; Sustainable development.

## Combating Air Pollution in Nigeria: Environmental Policy Review

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**Abstract:**

Air pollution is one of the major effects of climate risk on public health. According to the UN Environment, healthy ecosystems lead to lower vulnerability and more resilience of communities to natural disasters. This puts the environment as a key solution to disaster risks. In 1979, Catton and Dunlap explained the relationship between the ecosystem and modern, industrialized societies using the new ecological paradigm. The new ecological paradigm explains that the wellbeing of modern societies, even with the well-developed forms of social organizations and technology, is linked to the health of the ecosystem. This implies that the condition of the ecosystem is very vital for man's existence. Air is a major component of the ecosystem. Hence, the need to combat air pollution.

The United Nations Economic Commission for Europe Convention on Long-range Trans-boundary air pollution revealed that since the year 2000, over 40 million lives are lost annually in the globe as a result of air pollution. In Nigeria, one of the highest population density countries in Africa, urbanization is responsible for the release of toxic gases into the atmosphere. The significance of air pollution cannot be underestimated in our society. It causes damage to the earth's biodiversity systems, crops, human beings. One of the major air pollutants, ozone, is responsible for global warming, a major climate change challenge currently confronting the world. Air pollutants lead to reduced vegetable growth and deforestation which may lead to hunger and famine in some extreme cases.

In view of this, air pollution must be reduced to the barest minimum as it impedes the sustainable development of every society. Therefore, there is a great need for the government to formulate good policy measures that will achieve this.

This article vividly examines the effects and consequences of air pollution in Nigeria using existing literature. It also presents a critical review of the performance of the past and current policy options put in place to combat air pollution in Nigeria. These policies include the National Policy on Environment and the National Environmental Standards and Regulations Enforcement Agency Act (NESREA Act). The paper concludes by proffering alternative measures to promote good practices in climate change by improving air quality in the Nigerian society.

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## Network of Lgu-Designated Home Evacuation Centers and House Sharing as Typhoon Disaster Adaptation Strategy in Poor Communities Rooted in Malasakit and Pakikisama (Care and Cooperation) Culture of Bicolanos

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### **Abstract:**

This study examined the practice of local government unit (LGU) -designated home evacuation centers and house sharing as typhoon disaster adaptation strategy in poor communities of Malinao, Albay.

Data were gathered through FGD and KI interview of Samaritan Shelter owners, evacuees, local barangay executives and Local DRRM Officer. Secondary data on Municipal Contingency Plan, Municipal Disaster Risk Reduction and Management Plan were secured from the LGU Malinao.

Malinao, Albay, a third class municipality is geographically situated in alluvial plain where typhoons bring about the highest probability and severe impact among the disaster risks experienced in the area seconded by flooding where 93% of the total barangay is at risk. Funds and number of evacuation centers are meager to support more than 5,000 vulnerable household especially the poor and marginalized.

To address this problem, the LGU of Malinao institutionalized the Samaritan Shelter program, derived from the local practice and the Bicolano's culture of "malasakit" (caring and compassion) and "pakikisama" (cooperation). Hosts offer their houses for free as temporary shelter for 3 to 6 families within 3 to 6 days to ensure their safety. More than 540 Samaritan shelters are designated in the different barangays in the municipality. The Engineering department assess the extremely vulnerable, moderately vulnerable and vulnerable houses including the private shelters. Concrete and resilient houses with facilities such as comfort rooms, water, and road access are the basic criteria. This shelters are indicated in the Community Hazard Map for Typhoon, Flooding and Evacuation Center which is strategically located in each Barangay Hall. Participatory approach among the residents, Barangay Health Workers (BHW) and DRRM Council was done to create the hazard map. The Samaritan Shelter program is included in the 6-year Municipal Disaster Reduction and Management Plan approved by the National DRRM Council; and Contingency Plan for Typhoon Occurrences,

designed to minimize hazard from severe /super typhoon. An Incident Command System (ICS) is likewise used as immediate disaster response from responsible agency to affected communities not only for typhoon signal warnings as well as depressions. Prior to the disaster, the evacuees are already assigned to which Samaritan shelter they should stay. Basic criteria is the kinship or blood relationship to the host. Orientation of host and evacuees are done. There is no specific benefit or assistance given to the hosts from LGU. Sometimes they receive the same relief packs given to the evacuees.

The Samaritan Shelter program is an effective strategy in enhancing adaptive capacities of vulnerable communities through caring and cooperation and a cost saving mechanism on the part of the government in maintaining zero casualty. Moreover, challenges are encountered by program include (1) food supply for evacuees; and (2) the municipality being situated in an alluvial plain. The shelter hosts recommend that (1) service vehicles, food and other basic evacuation needs; and (2) training on DRRM, and how the shelter can better serve the evacuees, be provided by the LGU of Malinao.

## Socioeconomic Determinants of Climate Change Adaptation Strategies Used by Rice Farmers in Anambra State, Nigeria

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### **Abstract:**

The study assessed the socio-economic determinants of climate change adaptation strategies used by rice farmers in Anambra State, Nigeria. Two-stage sampling technique was used to select 71 rice farmers for the study. Data was collected with the aid of structured questionnaire complemented with interview schedule. Data collected was analyzed using descriptive statistics. Ordinary least square regression analysis was used to test the hypothesis. Application of chemical fertilizers (99%), pesticides (92%) and herbicides (85%), treatment of seeds (86%) and the use of stress tolerant varieties (80%) were the major climate change adaptation strategies used by the rice farmers in the study area while lack of access to credit source ( $\bar{x}$  =3.92), high cost of improved rice varieties ( $\bar{x}$  =3.41), lack of access to supporting institutional facilities ( $\bar{x}$  =3.37), high cost of irrigation facilities ( $\bar{x}$  =3.33), lack of access to weather forecast technologies ( $\bar{x}$  =3.10), poor access to and control of land ( $\bar{x}$  =3.06) were the major constraints faced in adapting to climate change. Ordinary least square regression analysis has an F-value of 10.895 which was significant at both 5% and 10% level showed a significant relation exist between the rice farmers socio-economic characteristics and the climate change adaptation strategies they use. The study recommended that extension agents should implement field-based teaching methods and practices to facilitate the building of knowledge

and skills in rice farmers as well as develop strategies with appropriate resources to address the needs of rice farmers in the study area

## **“O Boticário” as a Brazilian Eco-Friendly Company and the Results of this Behavior**

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### **Abstract:**

Currently, many companies see social and environmental responsibility as good business, suggesting that Eco-Friendly corporations are in line with morality and ethics. This has also been the growing view of Consumers on this scenario, which also affects the choice of the private sector to invest in mechanisms that effect this demand. At the same time, the implementation of an effective compliance program, in relation to Eco-efficient mechanisms in the exercise of business activity, makes negotiation more secure and transparent - between companies or between Consumers and companies, as well as it brings more confidence and attractiveness of investors and financiers. Such a vision, moreover, avoids the cost of capital and increases the market value of the organization, directly benefiting the company and hence its partners, not counting on the social benefits of an harmonious relationship between all these actors. In this sense, the research aims to study the Brazilian Company “Boticário” as Eco-efficient. For the Company, a sustainable product is one that the life cycle - from the raw material to the disposal - has a reduced impact on the environment and generates positive impacts for people - for its function or benefit, as well as for the chain of generation of value and income that it has the potential to provide. Applying this concept to the Business Activity, the group obtained improvement in Sustainability, in the products launched in 2017, in 50%. The company also created the "Grupo Boticário" Foundation, which has already supported 1,563 initiatives to protect nature. One of the programs supported by the foundation is called "Accelerate2030", now in its third edition. It aims to identify and leverage the impact of smart, innovative and sustainable business already in place that will contribute to achieving at least one of the 17 Sustainable Development Goals (ODS). Regarding Eco-efficiency, "O Boticário" Company understands that the investment directed to it comprises the interaction with the whole - internal and external to the Business Activity. Thus, the effects of climate change, global warming and the greater frequency of extreme events in climate can impact from the availability of raw materials and water to requiring us to relocate logistics routes. In addition, the lack of this guideline may require even greater efforts to manage our waste and the costs of our operation. The method used was inductive.

## Good Environmental Management Practices: The Example of the Village of Ndem in Senegal

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### **Abstract:**

The village of Ndem is located in Bambey in the Diourbel region, 120 km from Dakar. Relatively high poverty and a continuously deteriorating environment characterize this area, located in the Sahel region. This situation compromises harvests and encourages rural exodus. Therefore, many actions were carried out to fight against it by improving the living conditions of local populations for sustainable development. Indeed, efforts are being made to achieve the Sustainable Development Objectives in the village of Ndem where the capacity for action of residents and community leaders is very high and revolves around three axes:

- the identification and creation of income-generating activities (SDG 1, SDG 8, SDG 10);
- local populations' access to basic social and health infrastructures (SDG 3, SDG 4, SDG 6, SDG 7);
- sustainable management of natural resources (SDG 12, SDG 13, SDG 15).

Participatory approaches are essential in crisis and risk management in order to lead to measures that are culturally, socially, economically and politically acceptable to the individuals concerned. In this perspective, local populations have developed responsible attitudes and skills for environmental protection and sustainable natural resource management methods. Operators are now moving towards innovative irrigation techniques where drip irrigation saves large quantities of water. Hence, the implementation in the village of Ndem of an organic market gardening project. In addition, the populations have developed an ecological fuel composed of clay and groundnut shell. This fuel called "bioterre" is an alternative energy source. The village of Ndem has adopted a vision of sustainable development that attracts hundreds of visitors to draw on their expertise. In a qualitative approach, we approached the populations to learn more about the techniques and tools used to make their locality a sustainable development city. The purpose of this communication is to show the importance of involving people in environmental management and finding solutions to precariousness. It will also provide an opportunity to demonstrate that the actions undertaken are sustainable and not just technical risk management solutions.

## Fog harvesting for urban environments: new approaches to implement sustainability water science - the case study of Parma and Piacenza, Italy

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### **Abstract:**

This study focuses on maximizing the ecology of system boundary processes and offer fog harvesting lightweight architecture structure design opportunities and tailor the circularity of a city based on geography and climate characteristic conditions. Considerations are needed to be given such as global wind patterns, topography, relief in the surrounding areas, altitude, the orientation of the topographic features, distance from the coastline, space for collectors, humidity levels, Crestline and upwind locations. The threefold study: (i) applied a step-by-step replicable material flow analysis data collection pyramid model method, (ii) proposed a fog harvesting smart system tensile membrane design approach, and (iii) policy guidelines in the Mediterranean region of Emilia Romagna. The hot-arid provinces of Parma and Piacenza, in Emilia-Romagna, northern Italy has declared a state of emergency due to drought and shortage of water sources. In order to preserve water supplies and relieve the stress on conventional, over-exploited fresh water sources, fog water harvesting tensile membrane structures stand as a promising yet relatively unexplored science solution. This study provides method guidelines on the largely unexplored science domain of fog harvesting and catcher design approaches that can be integrated into cities as a secondary water source short and long term solution. Furthermore, this study supports the construction and deployment of smart fog water collectors for research, educational, and practical applications.

## Acheiving a Sustainable Approach To Current Climate Change Issues

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**Abstract:**

“Climate change occurs when changes in Earth's climate system result in new weather patterns that last for at least a few decades, and maybe for millions of years”(Liang, 2013). The world is already experiencing changes in average temperature, shifts in the seasons and an increasing frequency of extreme weather events and other climate change impacts and slow onset events. The faster the climate changes, and the longer adaptation efforts are put off, the more difficult and expensive it could be (United Nations Climate Change, 2018). These changes are one of the most pressing issues that needs not only to be addressed but tackled with well laid practices, structures and implementation. Solutions that results in significant potential decrease in climate change in the world at large needs to be considered and enforced to help to mitigate climate change-induced impacts and serve as proactive adaptation options for the world. This paper seems to explore the various good practices that could be observed and undertaken, most especially nature base practices as well as appropriate policies intended to stimulate efficient adaptation and mitigation not exclusively relying on the assumption of the homo economics, but take advantage of well-researched alternative behavioural patterns that are relevant for climate mitigation and adaptation in areas of the world, identify indicators for assessing the effectiveness of nature-based solutions and related knowledge gaps and also explore existing barriers and potential opportunities for increasing the scale and effectiveness of these solutions-based implementation (Kabisch, Stadler, Korn, & Bonn, 2016). Having a strong knowledge and capitalization of good practices have a key role to play in building a strong resilience, mitigation and adaptation of climate changing issues and a fair amount of these practices are considerably analysed so that organizations and the world at large understand what works well and why and thus can reproduce and upscale identified good and promising practices in order to inform policies adequately as illustrated in this paper(FAO 2014).

## Design of the Air Quality Evaluation and Monitoring Network for the City of Cartagena - Colombia

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**Abstract:**

The general purpose of this project is the Design of the Network for the Evaluation and Monitoring of Air Quality for Pedro de Heredia Avenue in the City of Cartagena de Indias in Colombia, in order to assess and analyze its current status establishing the compliance with current air quality standards, respond to complaints made by the community and take appropriate control measures.

For the development of this work, a situational diagnosis was made of the study area, of the city of Cartagena de Indias, where factors that are directly related to air quality are contemplated; such as population, topography and climatology.

In order to obtain the information, we counted on the collaboration of diverse entities of the public and private sector. Likewise, for the design phase, the criteria established by organizations with extensive experience such as the Environmental Protection Agency - EPA and the Pan American Health Organization at the international level and the Institute of Hydrology, Meteorology and Environmental Studies - IDEAM at a national level were followed.

The results obtained in the diagnosis and in the inventory of issuers, were taken as a starting point to carry out the Design of the Network for the Evaluation and Monitoring of Air Quality, where the pollutants and meteorological parameters to be measured are established, as well as the quantity and the most appropriate location for the stations, the equipment to be used, the necessary human resources and the costs of implementing the network.

In addition, a quality assurance and control program was defined, in order to guarantee that the data obtained by the network are representative of the atmospheric conditions of the area evaluated and comparable with national and international standards.

## Overcoming Climate Change Challenges in the Tourism Industry in Mexico

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**Abstract:**

Climate change has been a major contributing factor to many countries' economic development. Studies have been conducted to see how climate change and mitigation have affected business in many countries whose economies depend on tourism. One example is Cancun, Mexico. The tourism industry in Mexico is one of the most significant contributors to Mexico's whole economy. According to statistics, Mexico is the number one tourist destination for people from the U.S.—over 10 million tourists visited during “the first quarter of 2018”

(Flannery, 2018), and tourism makes up at least 8.7% of Mexico's GDP (Times, 2019). However, although Mexico's tourism industry continues to grow, there are also threats to this massive industry—especially due to climate change. As the tourism industry depends on the climate, it is essential to take note of climate change's effects and to research good practices to cope with climate change. In 2010, the Cancun Agreement established the Green Climate Fund and new technology mechanisms to reduce deforestation, discuss adaptation, and report mitigation. The goals of this agreement were to keep the global temperature rise under 2 degrees Celsius and monitor the Clean Development Mechanism (CDM) and Carbon Dioxide Capture and Storage (CCS). However, despite the agreement, Mexico still faces drops in population as the ecosystem drops due to climate change and damage to the tourism infrastructure.

## Effectiveness of Kingian Nonviolence Education and Community Dialogue on Fostering Peaceful Behaviour Among Yoruba Farmers, Fulani Herdsmen and Agricultural Extension Trainees in Oke- Ogun, Oyo State

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### **Abstract:**

This study investigated the effectiveness of Kingian Nonviolence Education and Community Dialogue techniques in fostering peaceful behaviour among Yoruba farmers, Fulani herdsmen and Agricultural Extension trainee in Oke Ogun area of Oyo State. Quasi experimental pre-test / post- test, control group was adopted for the study. The Multistage sampling techniques were adopted to select a total of One hundred and twenty (120) farmers, herdsmen, and Agricultural Extension trainees who lack adequate peaceful behaviour using the Conflict Handling Behaviour Rating Scale ( Hammed ,2002) as well as Aggression Questionnaire ( Buss and Peer, 1992). Two hypotheses were formulated and tested at 0.05 level of significance. The two hypotheses were tested using the Analysis of Covariance (ANCOVA). The results from the data analysis led to the rejection of the hypothesis. The findings of the study revealed that Kingian Nonviolence Education had significant effect on the participant peaceful behaviour. The study also revealed that Kingian Nonviolence Education was more effective in increasing peaceful behaviour among the participants.

Based on the findings, a number of recommendations were made which include the need for Agricultural Extension Trainees to be sensitized on the usefulness of Kingian Nonviolence principles, in promoting peaceful and peaceable behaviour in farming community. Furthermore, community leaders, various categories of farmers, Fulani herdsmen leaders, intermediaries, Police Officers and other security operatives should be taught on how to use Kingian Nonviolence s to engender peace in every society they find themselves. That peace is possible. That conflict can be handle maturely and proactively with a view to arrive at a

compromise

Keywords: Kingian Nonviolence Education, Community Dialogue, peaceful behaviour

## Community-Based Tourism: An Alternative Livelihood for Climate Change and Poverty Reduction .

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### **Abstract:**

The Community-Based Tourism ( CBT) is an upraising development project in Myanmar with Donors Driven Implementation as alternative livelihood activities. This study entirely focuses on Myaing Township, Pakokku District, Magway Region, Myanmar where ActionAid Myanmar(AAM) has been intervening as Local Right Programme Area\_4. Myaing Township is located in Pakokku District, Magway Region which is closed to Bagan, famous tourism area in Myanmar. Agriculture, livestock, Migration and hand-tube petrol production are key livelihood activities of Myaing township. The Research used to work for 30 months as a Programme Officer position with AAM for initiating and facilitating the CBT project at Inn Yaung Village Tract which is composed with Inn Yaung, Sulipan, Kangyitaw 1, and Kangyitaw 2. The CBT project is analyzed as poverty alleviation in the context of Social Entrepreneurship with women leadership and community participation lens. The study also considers the role of Meso-level institutions rather than Macro and Micro level institutions. The study is part of the Master of Art in Sustainable Development Practice at TERI School of Advanced Studies.

The study aims to evaluate whether the community-led social entrepreneurship model could be replicated as an alternative model for reducing poverty and climate resilience.

The study employed qualitative research with Participatory Rural Appraisal(PRA) tools such as mapping, Key In-depth Interview, Focus Group Discussion (FGD), Informal Interview ( II), Observation. The research practices community as co-researcher not objects with participatory and applied research approach.

The triple-bottom-line frame such as Ecology, Economy, and Society was applied to evaluate Myaing CBT project. As an outcome of CBT projects, one community forest was registered and reserved by four villages communities. Over 1800 trees were planted via visitors as a program of CBT with a plastic-free zone since 2016. Adolescent groups from four communities were trained for a clean campaign as a new generation, so they regularly clean the village streets once per two weeks. Drinking water ponds, Tube-well, and Dam for agriculture and livestock were implemented coordination with government departments, donor agency, civil society and contribution from community members. This is a success indicator of climate resilience as Myaing Township which always faces water scarcity for drinking, general usages, agriculture, livestock, and emergency.

For alternative income, community member could earn an extra income via providing foods, selling local products, working as CBT staffs, performing local music, cycling guide, and regular maintenance fees. The CBT could provide as an alternative livelihood income when agriculture activities were done. They have more opportunities for income generating activities such as producing shampoo, local snacks, and hand-made souvenirs. Women have more chance to get extra income according to the nature of works and program design of CBT.

In a perspective of Society, Women are empowered via involving several CBT related committees in leading roles. Thin Thin Hlaing became a leader of women group and Community after involving CBT related activities where women were thought to stay and work for family affairs mainly in kitchen works. Women have more chance to meet and talk with a higher level of government officials which can be seen in Myanmar society. The four communities received community development fund over 18000 USD for 2016 to 2018 as each visitors contribute 10 USD per person when they visit the CBT project. Utilization of these development funds, the community can set up electricity, tube-well, drinking water ponds, water pipelines to households, library, building a primary school building, and renovating village streets as the government has a limited budget. The four communities could promote the simplicity and authentic lifestyle of rural people with the warmest hospitality.

However, sustainability and ownership issues are big constraints that need to be addressed by different stakeholders and institutions. In conclusion, the Community-Based Tourism project becomes an alternative and emerging mean for poverty alleviation, women empowerment, and climate resilience in Myaing Township, Magway Region, Myanmar.

## Ensuring Community Forest Rights as a potent tool to combat Climate Change

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**Abstract:**

Internationally, community-based forest management through forest decentralization programs has gained popularity as a means of promoting forest protection while addressing

rural poverty. It has also been well-understood by now that protecting 'commons' is a potent tool to combat Climate Change. However, while there are examples of communities that have been able to successfully manage forests under these supportive national policies for decades, there are also cases of community groups that have been unable to access forest rights. This paper looks at factors that facilitate or impede the replicability of community forestry success focusing upon two specific case studies in India and Guatemala. We also discuss how ensuring Community Forest Rights may address Climate Change challenges.

Mendha lekha is a village that claimed India's first Community Forest Right (CFR) under the Forest Rights Act of 2006. Mendha lekha has a strong community collective and has been supplying bamboo to a nearby paper industry earning handsome income. However, even with such a potent success story, only 3% of the CFR claims have been recognized by the government. In Guatemala, community forest concessions protect the Maya Biosphere Reserve and harvest forest products. The concessions are internationally recognized for both the ecological and social benefits that they have achieved. However, despite the demonstrated success of the concession model, additional community groups have been in the process of soliciting concessions for over a decade with little success.

This research looks that the interconnection between community resources, government agencies and policies, and markets to understand factors that have impacted replication of successful community forest management in India and Northern Guatemala. Understanding factors that have contributed to these delays in replication is the first step in resolving this problem. Using these cases, we describe and compare the barriers to replication that exist at both the institutional scale and community scale utilizing both the community-capitals framework, market value chain analysis, and institutional analysis. For example, some of the factors that impede replication of success stories are: lack of political will in ensuring community rights, bureaucracy reluctant to relinquish control over forest administration, community collectives unable to influence bureaucracy to claim forest rights, and lack of market connections. Based upon this analysis we then provide suggestions for improving the replication of these success stories.

## Geoinformation-based Assessments of Good Practices of Climate Change Adaptation and Community Resilience for Sustainable Development in Africa

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### **Abstract:**

Climate change and environmental degradation had affected the world's natural resources, ecosystem services, socio-economy values and societies to a large extent. However,

considerable differences in the range and intensity of these impacts between regions provide insight into cumulative threats to marine biodiversity. Human-induced risks along the coastal zone have led to coastal degradation from marine pollutants, anthropogenic activities such as untreated discharges of municipal, industrial liquid and solid waste, depletion of marine species, and loss of marine habitat. The research adopted remote sensing techniques with data capabilities from ground-based meteorological station (NIMET), Landsat OLI, and Sentinel-2A satellite imagery, for monitoring the environmental impacts of marine pollutants and wastewater discharge along the Gulf-of-Guinea coast. The high-precision ALOS DSM and TANDEM-X satellite data were used to model the coastal terrain and the slope. The satellite data were processed using a web-based GIS tool known as Coastal Environmental Risk Index (CERI) was used to estimate the level of environmental damage and coastal degradation over the study area. Further geostatistical analysis were performed using the cellular automata and Support Vector Machines (SVM) methods. The results of the research suggested adaptation and protection measures through integrated management of land-ocean interaction in the coastal zone, enhancement of integrated global observation system, and coastal ecosystem-based management. Lastly, adequate information tools should be made available to policy makers and environmentalists to identify the most severe and pressing risks, and to assess and implement the most effective prevention and adaptation measures in reducing pollution of the seas. Mitigating the impacts therefore advocates for greater cooperation, and the strengthening of the decision makers, and the coastal communities to ensure sustainable development of regulation and resources management in the West-Africa.

## Decolonising climate change adaptation - lessons from Colombia

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### **Abstract:**

Colombia has emerged from decades of conflict only to now face its next big threat from climate change. Despite the emergence of peace, many urban and rural communities are still face precarious livelihoods. Such subsistence based local economies are affected greatly by climate change and its extreme weather patterns. Both by decreasing their productivity as well as increasing the risk of community members not being able to meet their daily needs now and in the future. Thus understanding the localised causes and consequences of climate change in Colombia is of high importance. In doing so, it is necessary to explore what puts those communities at risk from the effects of climate change in the first place. To explore this the case study of Mocoa, Putamayo will be used where climatic cycles of La Niña/El Niño in combination with poor environmental planning practices led to a large losses of life in a 2017 mudslide. This paper will suggest that an overwhelming contributor to the underlying vulnerability Mocoa possessed, was indeed western attitudes to the economy and social order, including widespread deforestation, pastoralization and urban sprawl that did not recognise the environment's limitations. When considering how to make communities such as this more resilient to future climatic change this paper uses a case study of Yumbo, Valle de Cauca.



Yumbo is a town on the rural fringe of Colombia's third biggest city Cali where a community workshop was held in April 2019 to explore what the community might do to adapt to climate change. What the results of this meeting show is that the global frameworks of the Sustainable Development Goals and the Paris Agreement have little utility on the ground because the solutions they offer are not yet practicable for the vast majority of people in low-income communities. Rather only through localised understandings of the effects of climate change, are achievable solutions found to improve adaptive capacity. As a result, whilst rooted in the Colombian context, this paper offers lessons that can be applied in other countries as to how to identify the root causes of climate vulnerability and how to remedy them.

## Understanding How Changing Diet Will Help Reduce the Effects of Climate Change in the Sahel: Promoting the Growing of Vegetables to Lower Animal-based Diet

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### **Abstract:**

Extreme heat waves, persistent and prolonged droughts, the advancement of desertification, and recurring floods lessen food production, causing food insecurity, resource scarcity, poverty, and migration. By aggravating the previously mentioned issues, climate change increases violent conflicts in the Sahel.

Climate change makes livestock farming more sedentary, and it emits more methane, puts more pressure on land, and pollutes the air more than the traditional transhumant livestock (Inter-reseaux, n.d.). The pastoralists, for climate resilience, progressively settle in fixed areas while trying other supplementary activities. At the same time, the traditional sedentary crop farmers additionally breed animals to compensate for the declining crops (Inter-reseaux, n.d.). Globally, animals emit 65% of the nitrogenous oxides, 35-40% of the methane, 9% of carbon dioxide, and account for 30% of water consumption (One Green Planet, 2017).

The need for animal products is expected to grow more than 250% by 2025 in the Sahel and Sub-Saharan Africa (OCED.org, n.d.). That is, the population in the region is increasing exponentially (201.1% by 2040) (OCED.org, n.d.), and climate change is forcing the rural inhabitants to flee to cities (UNCCD, 2014). The rapid population growth and urbanization are increasing the demand for animal and dairy products.

The objective of the inquiry is to look at the likely impacts of leading efforts of the local governments and other stakeholders to shift attitudes and behaviors regarding the perception of meat and dairy by pushing public awareness of the issue and promoting the farming of vegetables.

This research aims at answering the following question: How will the efforts of changing diet from the current high meat and dairy consumption to a more plant-based diet will contribute to

the climate change adaptation and resilience in the Sahel?

This paper will consult the literature available to try to find out whether a significant investment will increase the availability and the appetite for vegetables to the detriment of meat and dairy products. The researcher will also look at the economic opportunities, the health benefits, and the safety of the individuals for switching diet. It will also be crucial to explore how collectively, the abundance of vegetables will contribute to economic prosperity, social inclusion, and environmental sustainability for the region.

The paper expects to find that the promotion of the production of vegetables will lead to the availability and access to more sustainable food production and less pollutive production of meat and dairy. The plants, as a cash crop, will be a means for poverty alleviation and inequality and women empowerment. These findings would be relevant to the local efforts of climate change mitigation, adaptation, resilience, and ultimately significant to lower the levels of the current uncertainties in the region that climate change increases, such as poverty, food insecurity, resource scarcity, migration, and conflicts.

## Understanding How Climate Change Mitigation Through Gum Arabic Production May Lower the Levels of Violent Conflicts in the Sahel

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### **Abstract:**

This research examines the root causes of violent conflicts in the Sahel and explores the extent to which Gum Arabic production contributes to lower the levels of those conflicts. In the Sahel, violent conflicts have recently increased and have added to the humanitarian crises, such as poverty, famine, diseases, and ecological disasters (Caritas Report, 2018, September 3). Previous research findings linked the increase of the violence to climate change (e.g., Barlow, 2013; Brown, 2012; Klare, 2002; Sachs, 2015). As some theorists of international development (Easterly, 2002; Rodrik, 2007; Sachs, 2015) believe that there is “no one size fits all” solution for the problems inherent to each region, searching for an answer for the Sahel region is crucial.

This investigation is looking at whether planting as much Gum Arabic trees as possible may sustain the development of the region. The objective is to reconcile the economic growth with ecological enhancement and the social inclusion to reach a sustainable peace. This research paper’s literature review reveals how the Gum Arabic tree (the Acacia) has been beneficial to the Sahel ecologically, economically and socially.

Henceforth, this investigation tries to answer the following question: What are the effects of promoting the production of the Gum Arabic on the levels of violent conflicts in the Sahel? A desk research preliminarily laid out the assumptions about the correlation between Gum Arabic and violent conflicts mitigation. But it was essential to collect data on the ground, and Niger

was a convenience because the investigator is originative of that Sahelian country.

The findings on the ground revealed the Gum Arabic a valuable source of conflict mitigation in the Sahel. The interviews of experts and the documentation backed up that result, and the field observations on different sites confirmed it. Therefore, future research would provide more clues by including the ex-rebels and other individuals who used to be members of armed groups on the lists of respondents. A study on the relationship between promoting vegetables and Gum Arabic farming and violent conflicts would contribute to the literature on climate change and violent conflicts.

## Cross Reality (XR) Biophilic Design for Climate Resilience: Human Connections with Nature through Cyberspace

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### **Abstract:**

Climate change threatens human health and well-being. Climate phenomena such as elevated temperature, changes in precipitation, extreme weather events and rising sea levels impact our interactions with the built and natural environments. The impact of climate change on human health can be reduced by socio-ecological decisions for a sustainable future. There are urgent and growing needs for environments that are designed to promote climate resilience. The goal of this project is to examine how designers can respond to the need for environments for climate resilience.

Biophilic design has instinctively been implemented since the outset of human-made structures. Defined by Edward O. Wilson (1984) as the innate need to connect with nature, it is proposed that humans have intrinsically designed spaces to include both direct and indirect connections to nature. Regarding biophilic design, researchers found benefits related to physiological health, cognitive performance and psychological well-being. Digital technology with 5G can provide enhanced immersive experiences and exposures to biophilic environments. Cross reality (XR) tools include virtual reality, augmented reality and mixed reality, which accomplish not only different purposes but also foster synergetic interconnections between them. The objectives of this project are to 1) design biophilic cyberspace by utilizing the Biophilic Design Matrix (BDM) through cross reality which allows user experience of nature in the space, natural analogues, and nature of the space, 2) empirically evaluate how the exposure to the designed biophilic cyberspace relates to physiological, cognitive and psychological human responses, and 3) develop a mechanism to design biophilic cyberspace for vulnerable populations to improve health and wellbeing. This project intends to bring together

several disciplines in the university and community to address the impact of climate change on human health and well-being.

## Using ICT to disseminate livestock-based information to increase adaptive capacity to climate change in Uganda

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**Abstract:**

Using ICT to disseminate livestock-based information to increase adaptive capacity to climate change in Uganda

In a bid to develop adaptive capacity of farmers in the Ugandan cattle corridor, a project that used mainly ICT tools was carried out in four pilot districts for about six years. The main purpose of the project was “Enhancing Adaptive Capacity of Communities to Climate-Induced Water Challenges using ICT in Uganda” while the specific objectives were to (i) develop and test an information system combining mobile phone-based applications and community radios for enhancing adaptive capacity; (ii) enhance the ability of individuals and communities to plan for and respond to the impacts of climate change and (iii) inform policy processes with research-based evidence on the role and potentials of ICTs for improving the adaptive capacity. To operationalize these objectives; a baseline, midline and an end line survey were carried out

Baseline study involving 640 households, midline study involving 677 households and end line study involving 637 households in the four pilot districts showed that access to adaptation information improved by 47% in Soroti, 19% in Sembabule, and 11% in Nakasongola compared to the control district Rakai. The end line likewise showed that access to adaptation information increased by 48% in Soroti, 10% in Sembabule and 7% in Nakasongola compared to the control district Rakai. A 35% reduction of crop loss and damage was also registered in agro-pastoralist communities.

In conclusion, climate based information delivery and action gaps were identified through another baseline of which lack of farmer participation in their adaptive process was identified as a major bottleneck and used to inform a mobile application that uses peer-to-peer participation and has an interactive platform linking extension service providers with farmers as

end users to enhance sustainable adaptation to climate change. The pilot is still ongoing but has demonstrated quick uptake has promising results.

## Error Mitigation in Climate Interventions with Drought-Tolerant Crops

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### **Abstract:**

As climate change continues to disrupt established temperature and precipitation patterns around the world, communities are faced with the prospect of decreased food and economic security. This threat is particularly acute in isolated rural communities in the global south, where reliance on subsistence farming increases the risk of famine in the event of local crop failure. To address this risk, governments, multilateral organizations, and NGOs have increasingly turned to biological engineering as a means to increase climate resilience without significantly altering local practices. In areas prone to drought, climate interventions often focus on the introduction of drought-tolerant crops, which are able to survive and may even remain productive during prolonged dry periods. While these plants are certainly an important addition to the world's climate adaptation toolkit, the broad overprescription of drought-tolerant crops globally may be creating an array of negative unintended consequences for many communities. Risks posed by the imprudent introduction of drought-tolerant crops include: a) creating unrealistic yield expectations for crops that survive but do not thrive in drought, b) the exclusion of other strategies for drought management that may be more appropriate for a given local context, c) delaying the necessary permanent abandonment of land is becoming unsuitable for agriculture due to climate change, d) encouraging monocropping and other unsustainable land practices that degrade soil quality, and e) the introduction of drought-tolerant species in areas that end up experiencing similar or increased levels of annual precipitation as a result of climate change. Additional social risks include f) the nascent market for falsely-labeled counterfeit seeds in developing regions and g) the deterioration of critical trade and social linkages caused by increased perceptions of self-sufficiency. Each of these challenges can be effectively addressed through intervention strategies that take into account the inherent uncertainty of a changing climate, and provide communities with the tools to adapt to rapidly changing conditions, no matter what those conditions end being. Drawing from statistical evaluations of relevant prior interventions, this study suggests a framework for a more sustainable approach to building rural climate resilience through the introduction of drought-tolerant crops. If applied appropriately during the program design phase, this framework could reduce the incidence of harmful planning errors while providing sustainable benefits to communities at a comparable cost.

Keywords: Climate Adaptation, Climate Planning, Drought-Tolerant Crops, Sustainable Development, Risk Management, Agriculture

## The Effect of Climate Change on Women: A Case Study of Mexico, Cancun

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### **Abstract:**

Climate change in Mexico has impacted its economy and community. However, there is little awareness of the degree to which vulnerable citizens, especially women, are affected by these changes. Women and children particularly face incredible challenges due to climate change issues. In fact, 70% of the world's poor are women (IUCN, n.d.). In 2010, the vice president of research and director of the climate program, Roger-Mark De Souza, spoke during the UN Climate Change Conference held in Cancun, Mexico. Gender inequality factors into many climate change issues – for example, many women are in charge of gathering and producing food during climate disasters. It is also their responsibility, due to the culture of their countries, to source the fuel and heating needed to provide food. Studies must be done to analyze the negative impacts that women in particular face due to climate change in Mexico. Recent studies have found that many regions are facing serious water supply problems, as well as fewer crops. Because of these environmental changes, women are required to work in harsh conditions to provide their families with food and water. Policies to improve good practices in climate change must be adopted to help prevent further hardships for these vulnerable women.

## Climate Change, Rural Poverty and Global Goals: Reducing Vulnerabilities and Enhancing Potentials in Africa

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### **Abstract:**

The problems confronting mankind today especially in developing countries need to be resolved urgently. Two important potential solutions involves understanding the main variables or constraints and then adopting an appropriate development strategy. This is because most of these challenges are multidimensional in nature and require collaborative efforts. Within the African context rural poverty and climate change presents serious challenges to poverty reduction and sustainability. Despite the negative impact of climate variability globally rural poor people in Africa are the most vulnerable due to their dependency on nature and natural resources or products. In addition, the agricultural sector is the leading sector in the development prospects of most developing countries. This is in terms of growth potential, comparative advantage, poverty reduction potential and sustainability. However, the

agricultural sector is disadvantaged in developing countries because it is nature based and as such it is negatively affected directly by climate variability (change) in terms of water resources, biological diversity and ecological systems all of which are important variables in the agricultural and rural sector. Furthermore, and within the African context several sectors of the rural economy and major sources of growth and poverty reduction are directly affected by climate change. It is also important to appreciate the fact that the rural poor people are not only important perpetrators of climate change but are also significant victims of climate variability. Within this group of disadvantaged people vulnerable groups like women are the ones needing to be integrated effectively in the agricultural production strategy at subsistence level. A climate smart and pro poor people centered development growth strategy will not only reduce poverty but also facilitate the transformation of poor people vulnerabilities into capabilities leading to poverty reduction, sustainable development and ultimately the attainment of global goals. In line with the above this paper proposes a concrete understanding of and need to reduce climate variability and enhance potentials if global goals are to be met. It argues for the need to adopt a gender focused development strategy as a surest way of mitigating the negative effects of climate change. By empowering vulnerable groups who are the worst perpetrators of environmental degradation vulnerabilities will be translated into capabilities and potentials.

Key Words: Climate Change, Collaborative Effort, Sustainability, Vulnerability and Potentials

## Afghanistan's Effective Contribution toward Mitigation of Aral Sea Crisis

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### **Abstract:**

The paper addresses historical development of water resource management in Central Asia, focusing on the causes of the current Aral Sea Basin crisis, and specifies the obstacles facing the Central Asian republics in addressing this problem and offers predictions regarding the future state of the region's economy, ecology and stability. Moreover, in this research paper, I explain why Afghanistan was excluded from most of agreements related to Amu Darya River, which is the main source of Aral Sea. In addition, the article will explain how existing plans of action have been largely ineffective and why restoring the Aral Sea to its original condition is an impossible task. Finally, the paper will provide effective policy recommendations on how to prevent the further water mismanagement in the region while maintaining trustable levels of economic development and population growth.

## Social innovation to stop deforestation of the Colombian Amazon

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**Abstract:**

Universidad EAN (Colombia) and Climate Reality Project Latinoamérica start working in 2018 with the Guaviare region in Colombia (the begin of the Colombian Amazon), using talks with students of last year of school. For 2019-2020, the plan is more ambitious because in 2018 280 thousand hectares were deforested in the country, for multiple reasons: economic, social, illegal crops, livestock, and even, ignorance. The new project includes work with students, professors, and chancellors into the schools of San José del Guaviare (capital city of the state) and Florencia (capital city of the Caqueta State), but we will work with the mayor, municipal councils and other actors from the state, for generating a leadership and empowerment into the community, and to generate solutions for the people and from the people. We need to protect the Amazonian area, in synchronized with the sustainable development of communities and mitigation, adaptation and resilience to climate change, and this project it's an example as to how from the academy sector in association with the society, we will do activities for the present and the future of our planet.

## Effects of Land Use/Cover Change on Ecosystem Services in Dar es Salaam, Tanzania

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**Abstract:**

Conversion of agricultural land to urban uses is rampant in developing countries particularly in the Sub-Saharan Africa, Tanzania is not an exception. This study intended to establish the main drivers of land use/cover change and determine their effects on ecosystem services in Dar es Salaam City, Tanzania. In establishing the main drivers of land use/cover change the study utilized household questionnaires and a focus group discussion guide. A total of 240 respondents included in the study were randomly selected from the four communities surrounding watershed ecosystems (Forestry and River systems) in Dar es Salaam. The data was analyzed using a Logistic Regression in SPSS Windows (11.5). Findings indicated that the main drivers of change are population growth, customary land tenure, land market and livelihood activities. Other drivers included; weak land use laws, extension agents' visits, and education were not significant at 5 percent level ( $P < 0.05$ ). The time series regressions showed that small scale (non-uniform) farming (0.829) and Forest ecosystems (0.697) had relatively strong regression strength and good fit compared to River systems (0.053) with very weak regression strength and a weak fit.



## The link between indiscriminate felling of trees and climate change

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### **Abstract:**

The challenge of climate change experienced in continents across the world cannot be wished away. The emission of carbon monoxide into the atmosphere contribute immensely to the depletion of the ozone layer that result in climate change.

In many rural areas of Nigeria, people still make use of firewood for cooking, which is sourced from indiscriminate felling of trees in the forest that also cause deforestation. Trees in the forest which should serve as wind break during thunderstorms are cut for cooking, desertification also result from this.

Forest protection is extremely important to preserve trees because forest help to stabilize land, reduce soil erosion thereby preventing desertification. Reforestation and afforestation should be embarked upon as forest is of great importance for ecological stability and crop yields in agriculture.

Climate Change have resulted in increased temperature and decrease in precipitation with the shrinkage of the Lake Chad Basin which is close to Northern Nigeria, which serve as a means of irrigation for farmers in that region as agriculture is the major source of income for people living there.

A policy that would make people that cut trees indiscriminately in the forest to pay fine should be enacted to preserve the forest. Conservation of trees, selection and planting of drought resistant trees, creation of seedbanks for conservation of trees and shrubs should be highly encouraged.

In conclusion; pollution that contribute to the depletion of the ozone layer should be drastically reduced in all continents of the world by recycling waste without burning, the use of clean energy cooking stoves to cook, responsible manufacturing in factories with limited emission of carbon monoxide and reduction of combustion from vehicles in traffic and rush hours.

The actualization of the United Nations Sustainable Development Goal (SDG) 13: Climate Action is very important to overcome the challenge of climate change.

## Assessment of the Impact of Climate Resilient Agricultural Practices on the Livelihood of Smallholder Cereal Farmers in Kenya: The Case of Embu County.

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**Abstract:**

Climate change is one of the greatest challenges threatening livelihood sustainability and agricultural dependent developing economies of the world in the 21st century. It is estimated that the cereal sector in Kenya experiences post-harvest losses of 10 - 30% of the cereal produced with the major losses occurring at the farm level due to poor post-harvest handling and management practices. As part of the efforts to provide solution to the issue of climate change facing smallholder cereal farmers in Kenya, the Government of Kenya in partnership with International Fund for Agricultural Development (IFAD) has created the Kenya Cereal Enhancement Programme and Climate Resilient Agricultural Livelihood window programme to contribute to national food security and smallholder income generation on a sustainable basis. It is against this backdrop that this study aims to assess the impact of climate resilient agricultural practices on the livelihood of smallholder cereal producers in Embu County, Kenya. Three key cereal commodities (maize, sorghum and millet) were selected for the study. This study adopts a survey design and the concept of climate smart agriculture to constitute the conceptual framework. A multi-method research strategy which includes qualitative and quantitative research approach for data collection and analyses will be adopted in a bid to complement the validity and reliability of the study's results. Stratified random sampling technique will be employed in carrying out the survey. Both primary and secondary data will be used and 500 respondents interviewed. The study will employ structured questionnaire, Focus Group Discussion (FGD) and in-depth interview as the main instruments of the survey. Both descriptive and inferential analytical techniques will be employed. Preliminary findings indicate that there is significant variation between climate smart agricultural practices and the cereal production on one hand, and geographical location of cereal farmers is significantly influenced by cereal production on the other.

## Scaling up university engagement with the water and sanitation Sustainable Development Goal for climate adaptation

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**Abstract:**

Universities remain at the forefront of scaling up the implementation of the 2030 Agenda for Sustainable Development and its interlinked 17 Sustainable Development Goals (SDGs). From these SDGs, this paper focusses two dealing with ensuring access to water and sanitation for all by 2030 (SDG 6) and how this interfaces with the climate action goal (SDG 13). The paper investigated how the University of South Africa (Unisa) has localised SDG 6 in an attempt to ready itself for eventualities regarding climate change, water shortage and general

underground water conservation. It emerged that Unisa developed a Water Master Plan and had commissioned a large scale rainwater harvesting on its main campus in Pretoria, South Africa. This investment and engagement, will result in huge water and cost savings by minimising irrigating from boreholes and drawing water from the municipal system. What Unisa did remains a proactive move in a country that has been fighting extreme, successive and frequent droughts in recent years. Terms like 'Day Zero' have emerged in reference to a situation where the City of Cape Town was predicted to run out of water in 2018, yet as this paper was being prepared, a small town of Makhanda that hosts one of the country's top residential universities, effectively realised Day Zero in February 2019. The work calls upon other institutions of higher education in South Africa and elsewhere across the globe to join this movement of rainwater harvesting as part of not only minimising drawing from municipal water sources, but ensuring that universities are at the coalface of SDG 6 implementation.

## Impact of Climate Change on Agricultural and Manufacturing Sector: The Economic Implication in Sub Saharan African Countries.

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### **Abstract:**

Climate change impact is a global phenomenon that affects economic performance in diverse ways. But, the different ways climate change affects the economy is dependent on the level of economic activities of a particular country. However, these economic activities could be industrial/ manufacturing, service, intellectual activities, agricultural and allied activities. Thus, this study tries to analyse the empirical impact of climate change on the agricultural and manufacturing sectors to determine the economic performance in Sub Saharan African (SSA) Countries. Specifically, the study tries to determine both the direct and indirect effects of climate change on the value-added share of the agricultural and manufacturing sector in Gross Domestic Product (GDP) and how it affects economic growth. The study will employ the method of Co-integration Analysis, Error Correction Model and adopt the production function model using annual data from 1980 to 2016. Therefore the study, intends to focus on the subject-matter by investigating whether: i) climate change significantly affects economic growth with the impact more on the agricultural or manufacturing sector in SSA countries? And ii) determining what short-run and long-run relationship exist between climate change on manufacturing and agricultural sector in SSA countries? The result shows a negative correlation between GDP and value-added share of the Agricultural sector in the GDP as well as GDP and value-added share of the manufacturing sector in the GDP. This result indicates that climate change impact on the value-added share of Agriculture in the GDP conforms to apriori expectation. Thus, this study concludes that climate change impact varies as the effect is likely

not the same across countries and how it affects the economic performance of specific countries differs.

**Keywords:** Climate Change, Value Added share of Agricultural and Manufacturing Sector, Economic Growth, Gross Domestic Product, Co-integration Analysis and Error-Correction Model.

## Climate change and agricultural sustainability: Perceptions, impacts and adaptation strategies among smallholder farmers in Gombe State, Nigeria.

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**Abstract:**

The reality of climate change and how it affects the livelihoods of small scale farming communities in agrarian economies is an increasingly growing concern. The realization that climate change is here to stay has compounded the need to understand its occurrence in a bid to devise coping mechanisms among the most affected people. The ability of smallholder farmers to effectively adapt to this new reality requires adequate information as to how they perceive it, what impact it has on their livelihoods in order to adequately design coping strategies. This study therefore examined the perceptions of climate change and its impact on smallholder farmers, as well as the adaptation strategies adopted by the farmers in Gombe State, Nigeria. The primary data used in this study was collected through the use of a structured questionnaire administered on 240 randomly selected members of farming communities in the State. Data was analyzed using both descriptive and factor analysis methods. Results show a widespread acknowledgement and understanding of the seriousness of climate change, with various impacts on crop and livestock production, such as poor rains, increased occurrence of pests, poor harvests, animal diseases, loss of pasture and water for animals among others. Results also show that farmers have adopted various strategies in a bid to adapt to climate change, including: use of drought resistant crop species, local irrigation techniques, crop rotation, use of local fertilizers, animal pad docking, use of pesticides, rainwater harvesting and conservation of feed. The study concluded with the understanding of the severity of climate change has helped farmers in devising effective adaptation strategies, and recommended that more assistance from government is required, especially in sensitizing farmers, and supporting them with subsidizing the costs of adaptation measures.

Key Words: Climate Change, Adaptation Strategies, Agrarian Community, Smallholder Farmers, Livelihood.

## Managing Climate Change and its Impacts on Urban Cities in Sub-Saharan Africa Region: Issues, Challenges and Options

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### **Abstract:**

If there is any common challenge that is plaguing the whole world today, perhaps irredeemably, it is the Climate Change.

Climate Change has certainly become a global phenomenon and a scourge of our time that has enacted some of the worst pogroms and fratricidal carnages into the world towards the end of the 20th Century now graduating into the 21st Century.

This informed the establishment of The Intergovernmental Panel on Climate Change (IPCC) which is an intergovernmental body of the United Nations dedicated to studying and providing the world with an objective, scientific view of climate change, its natural, political and economic impacts and risks and possible response options. This has led to its report which is tagged “Climate Change 1995 – The Science of Climate Change Contribution of the Working Group”

The question now is: “How is Climate change related to urban cities and the position of the Sub-Saharan Africa cities in this context?”

This paper examines the concepts of climate change and its characteristics as a global phenomenon and urban cities and their characteristics; discussing causes of climate change and its expected impacts on cities and their sustainability especially its disproportionate impacts on the most vulnerable people who are usually the poor who live in informal settlements such as slum- dwellers with limited access to tenure security, safe housing and public services; women, children and the aged people all of which can become a serious impediment to poverty reduction.

It goes further to highlight the challenges of these impacts on the urban cities and their governments especially in the sub-Saharan Africa region and offers the various strategies that the urban cities governments can adopt in tackling those challenges which center on climate change issues that can be broadly classified into climate change mitigation, adaption and resilience accepted as the best practice in climate change discourses.

Also the paper provides The IPCC reports that contribute to the work of the United Nations

Framework Convention on Climate Change (UNFCCC), the main international treaty on climate change with the objective of "stabilizing greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic (human-induced) interference with the climate system". The IPCC's Fifth Assessment Report was a critical scientific input into the UNFCCC's Paris Agreement in 2015 which has become the valid document on climate change.

Finally, in conjunction with this, the paper makes reference to the relevant Sustainable Development Goals which include an explicit standalone urban SDG11, 'make cities and human settlements inclusive, safe, resilient and sustainable'. When read with SDG13, 'take urgent action to combat climate change and its impacts', and SDG7, 'ensure access to affordable, reliable, sustainable and modern energy for all', we have a policy frame of goals, targets and evidence-based progress monitoring towards climate action at all scales.

In 2015, the UN launched the 17 Sustainable Development Goals (SDGs). Adopted by 193 member states, the goals represent an important international step in setting humanity on a trajectory towards sustainable development

Keywords: Climate Change, Urban Cities, Intergovernmental Panel on Climate Change (IPCC), Sustainable Development Goals (SDGs), Sub-Saharan Africa Region.

## A Step Towards sustainable ecology: green urbanization

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**Abstract:**

Climate change has been contingent on anthropogenic emission and natural climate variability since the long decade. Human actions which emit greenhouse gases have the highest effects on the human and natural system and weather-related disaster. Due to urbanization and growing population more greenhouse gases are being released in the environment in several forms which is producing more urban heat island effects. To address this problem, we need a robust action plan in to initiate and continue for the future in both at the highest levels and ideally as part of a strong climate action plan which should be sustainable. Our proposal has explored the detail conditions of Dhaka city where we are going to apply our solution first where climate change is related to special effects of greenhouse gases.

Our purpose solution is rooftop gardening through a mobile application known as 'Shamol' which shall introduce with the alliance with Government and Urban household committee for a sustainable approach where it covered the goal of Sustainable Development Goals 13,11 and 12. 'Shamol' project will help to introduce rooftops in their buildings in Dhaka city which is the most available alternative for plantation urban city of Dhaka. There will be two packages in the application, in one where users will get paid for registering their rooftops for framing purpose and another package authority where users will pay us to grow specific products; vegetables for example. Also, the use of organic waste for rooftop gardening will be incorporated. The app services from the developer's end will depend highly on the needs of our clients which will run according to the business model which are well described in our proposal.

## Think Globally, Act Locally: The Growing Influence of Subnational Governments in Climate Action

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### **Abstract:**

Recent discussions of climate change mitigation and adaptation in the United States have been dominated by the proposal for a Green New Deal (GND). Various referred to as a resolution, proposal, or mobilization, it incorporates a wide range of high-level environmental, economic, and social justice policy proposals. The GND represents a top-down approach that positions the United States federal government as the main driver of climate policy and program implementation.

What is missing from the GND and the discussions surrounding it is the robust bottom-up approach to climate change mitigation, adaptation, and resilience occurring at the subnational level throughout the world. Driven by localized risk, cities and states are defining and implementing concrete plans in addition to proposing big ideas. Hundreds of municipalities are adopting short- and long-term climate plans, creating scalable and transferable frameworks, and performing valuable research and development activities.

In short, the tenets of the GND are already in progress in cities like Accra, Boston, Quito, and Rio de Janeiro, alongside states and provinces like California and British Columbia. These subnational governments are partnering with citizens and civil society organizations to lead the way on climate change mitigation, adaptation, and resilience efforts.

In this presentation, I will explore the policy implications of current climate change leadership at the subnational level. Topics under consideration include:

- How cities and states are responding, including an overview of planning, legislation, regulations, and programs

- Gathering support and building consensus in areas where nearly the entire population will be materially affected by climate change
- Exploring financing options in the absence or unpredictability of federal funding
- The increased visibility and power of cities and states on the international stage
- Policy and program strategies, including frameworks for knowledge management and information sharing, strategies for citizen engagement and empowerment, models for public-private partnerships (with universities, locally dominant industries, developers, etc.), and methods for identifying and supporting innovative, iterative approaches

As national governments continue to make commitments to both internal and international agreements, successful programs implemented by subnational governments can serve to inform policy decisions and guide implementation strategies. Collecting, organizing, and disseminating the accumulated knowledge poses a significant challenge, but the long-term benefits far outweigh the costs.

## Gender Inequality and Adaptive Capacity: The Role of Social Capital on the Impacts of Climate Change in Vietnam

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### **Abstract:**

Climate change has exacerbated gender inequality, and women are a vulnerable group. Previous research attributed this to physical gender differences, gender differences in ownership and control of natural resources, and socioeconomic status. We used a survey of 99 participants, seven focus group discussions, and 13 in-depth interviews in a coastal community in Vietnam to gain insight into the roots of gender inequality in the capacity to adapt to climate change. We analysed the role of social capital in regulating and mobilising other livelihood



assets from a gendered perspective and found that gender norms explain the division and interactions of men and women in formal and informal networks. Based on our results, we suggest that policy-makers should pay more attention to gender issues when proposing climate change policies and reducing the gender imbalance in the impact of climate change adaptation.

## The Economical and Societal Cost of Sea Level Rise in the United States

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### **Abstract:**

Sea level rise is a sure thing, and the consequences of sea level rise could be the most difficult challenge the United States has ever come up against. It is a real issue already affecting the lives of millions of people. The consequences of sea level rise are coastal erosion, increased damages from storms, the decreased benefits of natural buffers, (wetlands and coral reefs), nuisance or “sunny-day” flooding, culminating with human displacement. Therefore, this paper investigates the cost of adaptation policies for sea level rise, as well as the economic and societal damages associated with rising seas in the United States specifically. The role of government is critical in order for the United States to adapt to sea level rise. It is widely accepted by economists that the cost of environmental abatement policies are higher the longer the problem is allowed to persist. Municipalities that are at the greatest risk of being affected by sea level rise should be looking to adapt to the changing shoreline in the near future.

Adaptation can take years and will be costly. If coastal developments do not adapt to sea level rise the cost of damages is expected to be four times the amount it would be otherwise. Furthermore, the data also alludes to an interesting point: that it is futile to get caught up in the argument of whether society should be mitigating climate change due to human activity or not. Sea level rise is happening, there is no reason to assume it will miraculously reverse itself. In fact, anyone who believes human actions had no bearing on climate change would have to conclude that no human action can reverse climate change, and preparing for its consequences becomes an imperative. Although I am not advocating that mitigation is pointless, adaptation needs to happen whether the climate change is man-made or not. Hence, what does adaptation entail?

## Carbon debt from forest to oil palm conversion: Best management strategy as a mitigation option

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**Abstract:**

Palm oil from oil palm (*Elaeis guineensis* Jacq) is one of the most important vegetable oils in terms of production and trade, however, the conversion of tropical forest to oil palm plantation created environmental controversy. We hypothesised that it is possible to reduce the carbon debt and greenhouse gas emission by using best soil management practice utilizing organic residues in oil palm plantations. Soil samples were collected from forest and nearby oil palm plantations in different age group with different conversion period and management practices in Malaysia and Indonesia. Soil gas samples were also collected using closed static chamber from nitrogenous fertilizers, organic amendments namely empty fruit bunches, enriched mulches (EMU: pressed empty fruit bunches+palm oil mill effluent) in different doses, combination and spatial layouts to investigate the best fertilization approach in terms of environmental sustainability. Modelling approach and scenario analysis of GHG emission influenced by addition of organic amendment and fertilizer management have also been done to investigate the probable carbon payback time regarding the carbon debt created by conversion of native forest to oil palm plantations. The result showed soil organic carbon stocks declined up to 42%, after 49 years of conversion. Best management practice stored more carbon than smallholder management practice. Gas sampling showed emission factors ranging from 2.4-2.7 % in the long-term experiment from inorganic fertilizers. Organic amendments were a significant source of both N<sub>2</sub>O and CH<sub>4</sub> emissions but, N<sub>2</sub>O emissions from organic amendments were 66-86 % lower than those from inorganic fertilisers. Among the various organic amendments available, application of enriched mulches found to be the best option due to its greater GHG mitigation potential as well as source of important plant nutrients. However, the modelling approach showed that application of organic amendments during replantation and production cycle lead to reduction of the carbon debt created by primary forest conversion but cannot be able to close the gap completely with best management practices in 100 years' time period. Conversion of degraded land or other crop land would be an option rather than conversion of primary forest to oil palm plantations. This study could serve as a baseline for better understanding of GHG emissions and their dynamics in inorganic soils to

reduce environmental losses, which can increase the economic benefits and agro-ecological efficiency of oil palm management systems.

## Urban Sustainable Development and Water Issues' Solutions in Changing Climate: Economic Growth Tool in Southeast Asia

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### **Abstract:**

After super Typhoon Haiyan devastated central Philippines on November 8, 2013, access to safe clean water and sanitation were pressing concerns for survivors. It served as a wake-up call for urgent action by the Philippines. In fact, in addition to natural calamity impacts, the cities in Southeast Asian Archipelagos (Philippines, Indonesia, and Malaysia) plus Myanmar and Thailand have also distorted the natural environment meant for sustainable water resources. Water problems of the above countries' cities are viewed as the consequence of rapid and uncontrolled urban development and Climate Change (CC) variations. Water remains pivotal for

sustainable development and is also linked to a number of CC challenges such as local flooding, water shortage, and pollution. These facts emphasized the link between water insecurity and its negative impact on the economy. Therefore, equal and inclusive policy objectives must be developed, without which, achieving the Sustainable Development Goals (SDGs) and CC themes for universal access to drinking water, sanitation, and hygiene is not possible. This research used extensive secondary data to identify and understand the causes of water problems due to urbanization and CC variability of the urban areas near major rivers of the aforementioned countries. To affirm the problem, pilot case study is, however, only done for Quezon City (QC), Philippines by collecting primary data, which was selected using Logical Decision for Windows software with built-in statistical tool. The water supply crises that hit Metro Manila on March 7, 2019 forced people from all walks of life to line up for water rationing. Further businesses in the country called for urgent short- and long-term solutions to water shortage. Indeed, it could affect Philippines' economic competitiveness because water is an important resource to the industry. If this situation coupled with the dry season and El Niño, a prolonged shortage may also dent agriculture. Dampened economic activity and weak agricultural output due to the water shortage may drag Gross Domestic Product (GDP) growth of the Philippines. To resolve these challenges, a sustainable solution is required. Therefore this study crafted inclusive objectives and policies through strategic spatial analysis using Geographic Information System (GIS) and gender-sensitive participatory process. The output defined 15 Programs, Projects and Activities (PPAs) as solutions for water sufficiency, sanitation, and hygiene across five development sectors (Social, Economic, Environmental, Land Use/Infrastructure, and Institutional). These PPAs are segregated into: 9 on immediate-term (within one year); 2 on short-term (1-3 years); 3 on medium-term (4-6 years); and 1 on long-term (7 years and above) basis. The appropriate implementation of these PPAs will ensure QC's sustainable development, CC-resiliency, and its contribution to the country's GDP. Further, the framework and methodology used in the case study is flexible and can be fashioned for the other cities in South East Asian countries and other regions.

## ARID LAB: Good Practices on Climate Change and Sustainability in Brazil

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### **Abstract:**

Parts of Brazil (Northeast Region) and many regions in the planet had been threaten by more constant droughts. The need to food availability presents as constraints an increasing water insecurity. It presents as strategic to formulate strategies of Research, Development and

Innovation (RDI) related to the climatic resilience to guarantee the sustainable agricultural production focused on the traditional communities, familiar farmers, besides small and average farmers.

The Arid Lab is an initiative to apply self-sustaining socio-environmental technologies applied to populations based in arid and semi-arid regions threaten by drought and climate change.

Arid Lab is a spinoff result from operations of Mars simulation station, Habitat Marte, operating in the rural area of Caiçara do Rio do Vento, Rio Grande do Norte, Brazil. The laboratory is in operation at the Nucleus of Research in Engineering, Science and Sustainability of the Semiarid - NUPECS (<http://nupecsufnrn.blogspot.com/>), in the city of Caiçara do Rio do Vento, Rio Grande do Norte State, Brazil.

Arid Lab seeks to bring the academy closer to the productive sector and communities by providing affordable and economically viable technology solutions with a focus on low-income communities.

The site has high temperatures, dry and infertile soils, high evaporation, low availability of water and small annual rainfall (less than 660 ml / year).

Arid Lab has as a challenge to function as a circular space that presents as a main concept the responsible and innovative use of water, its management, economy and reuse.

Among the technologies operated in Arid Lab are: reuse and proper disposal of waste water; rainwater capture and storage system; circular food production system in a closed environment (greenhouse) having as technology the aquaponics; external lighting system powered by photovoltaic modules and agrobeds for food production.

Thus, the effectiveness of Arid Lab is directly related to the Sustainable Development Goals (SDG's) proposed by the UN in The 2030 Agenda for Sustainable Development in 2015.

The innovations developed allow provide nutritious food in areas where poverty, hunger and food insecurity are more prevalent (SDG 2) through an efficient and non-wasteful production system (SDG 12).

Thus, the Arid Lab presents itself as a center of innovation for structuring technologies (SDG 9) that makes also possible promote inclusive education to benefit the local population (SDG 4). Arid Lab presents embedded self-sustaining socio-environmental technologies that could be replicated in different regions of the planet.

The idea is to share internationally the experiences developed in Arid Lab and to capture partnerships, resources, support and other research and innovations that can be incorporated in the operation of the initiative.

## Climate Smart Livestock Project: Evaluation of 96 good livestock practices designed for mitigation and adaptation for climate change in Ecuador

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### **Abstract:**

Livestock supply chain is a source of a large amount of greenhouse gases (GHG). It is estimated in 7.1 million Gg of CO<sub>2</sub>-eq per year, representing 14.5 % of anthropogenic gases worldwide. Further, the impacts of climate change have a direct influence over the livestock productive activity. The International Panel on Climate Change in its Fifth Assessment Report (2014), recommends to consider the hazards that changes in the climate represent, as well as the socioeconomic processes of the system to be assessed. In Ecuador, the livestock production systems are evaluated from a climate-smart perspective by considering three objectives: 1. sustainably increasing agricultural productivity and incomes; 2. adapting and building resilience to climate change; and 3. reducing greenhouse gas emissions. The assessment is carried out by the Climate Smart Livestock Project (CSLP), an initiative of the Ecuadorian Ministries of Environment and Agriculture and Livestock, with technical support from the Food and Agriculture Organization of the United Nations (FAO), financed by the Global Environment Facility (GEF). Over 165 monitored farms known as “pilot farms” and 840 farms that replicate the methodology, distributed in seven provinces are beneficiaries of the project implementation.

The CSLP developed a study related to the GHG emissions from beef and dairy cattle in the country using local information to derive the estimates. For 2016, the preliminary results show a value of 15981.68 Gg of CO<sub>2</sub>-eq from direct emissions, being 77.914% CH<sub>4</sub> from enteric fermentation, 17.93% NO<sub>2</sub> from manure in pastures, 2.63% CH<sub>4</sub> and 2.31% NO<sub>2</sub> from manure management. A second study evaluated the livestock sector climate risk, comparing the

relationship between intense rains, droughts, heat waves and frosts; with the exposure in three dimensions (environmental: pasture area, socioeconomic: number of animals per producer and governance: established productive associations). Additionally, 27 socioeconomic variables were integrated in the calculation of sensitivity and adaptive capacity. The results show that the increase of extreme events in drought and intense rains constitutes the threats with greater impacts in the livestock systems.

Based on the preliminary results, the CSLP compiled 96 good livestock practices that contribute to a climate-smart management, improving the efficiency of the productive systems, adapting them to climate change and reducing GHG. A customized set of practices were implemented on each farm, based on individual needs identified after a local evaluation. Pasture and water sources management stand out as important factors for the development of intervention strategies. In order to estimate the impact from implementing the practices, the project developed two mobile apps to automate the evaluation process in mitigation and adaptation, using open source resources. The apps use algorithms to estimate emissions and climate risk, using herd data (number of animals, production, reproduction, weights, etc.) and farm data (area, conservation area, pastures, infrastructure, etc.). These estimates are calculated prior to project execution and two times per year after the implementation of the good practices. Preliminary results indicate a climate risk reduction and an increase of the adaptive capacity to climate change in the pilot farms where the project is collecting data and producing constant records.

Keywords: Climate change, livestock, greenhouse gases, climate risk, mitigation, adaptation, Ecuador.

## [A Critical Ethnography Approach to Ethiopian Climate Perspectives, Literacy, and Action](#)

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### **Abstract:**

Much of Western climate action work is focused on getting people to care about climate change. The logic is once we all realize the gravity of our global situation, we will take action and climate change will be stopped. The common knowledge is that the only true way people turn their attention away from the myriad of other social issues and onto something as far away and hard to grasp as climate change is when it directly affects them. Public attention and ensuing action happen only in response to a natural disaster or another event exacerbated by climate change.

However, I seek to challenge the assumption that the only barrier to action is awareness of the issue. To this end, in the month of June, I will collect data from people in Ethiopia, a region that feels the direct effects of climate change not only occasionally when there is an especially bad weather event, but consistently throughout the year. According to the above logic, the people of Ethiopia should be aware of climate change and therefore should be taking widespread action to address it. This study aims to find out whether feeling the direct effects has translated into various levels of action, what additional barriers exist to climate action in Ethiopia, and what solutions to these barriers are feasible and culturally competent according to community members.

The product of this research will be both a paper analyzing the responses of interviewees, as well as an advocacy video allowing Ethiopian voices to reach places and people far away from their community.

This project will be conducted in conjunction with a fellow student's investigation into the mindsets of rural community members in the Lake Tana region of Ethiopia concerning renewable energy.

## Stories for Climate Ambition - A narrative assessment of the UNFCCC Talanoa Dialogue

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### **Abstract:**

The Paris Agreement signed in December 2015 introduced two innovations to the international climate regime. It stepped from the top-down approach of the Kyoto Protocol to create a bottom-up mechanism whereby each country party to the agreement provided their own nationally determined contributions to reach the common goal of limiting global warming to 2. It also opened the door for non-party actors – subnational governments, NGOs, businesses and civil society to take on a more formal consultative role in the negotiation process.

This was built two years later at COP 23, presided by Fiji, the first small island nation ever to lead a COP. The Fijian Presidency further developed this consultation mechanism by launching the Talanoa Dialogue, named after a traditional Pacific method of exchange: “the purpose of Talanoa is to share stories, build empathy and to make wise decisions for the collective good. The process of Talanoa involves the sharing of ideas, skills and experience through storytelling” (UNFCCC, 2018).

The Talanoa Dialogue, with its explicitly narrational purpose, offers us a perfect opportunity to observe how various stakeholders tell stories in the institutional setting of international climate policy. Recent work in narrative policy theory has indeed suggested that the telling of stories may be a more effective way to present complex policy issues than the purely scientific



approach that has so far dominated the UNFCCC. In the context of climate change, where science is inextricably entangled with political and economic interests, stories can help their audience take a step back from contentious technical jargon and map out common ground where agreement can eventually be achieved.

This presentation will explore the extent to which the use of narratives can facilitate the increase of ambition on climate action at the international level. It will do so by analysing a sample of 94 documents submitted by countries and other stakeholders as part of the consultation process. I will first draw on narrative theory to identify which of these submissions do indeed follow a narrative form. I will then examine the dominant narratives that are used to discuss climate policy, and assess whether different types of organisations (e.g. environmental NGOs, businesses, local governments) tell different types of stories. Finally, I will critically analyse whether the stories of best practices shared in the Talanoa Dialogue affected climate policy-making as a whole.

Keywords: policy narratives, climate change policy, Talanoa Dialogue

UNFCCC. (2018). 2018 Talanoa Dialogue Platform [International Organisation]. [Accessed 29.05.18], <https://unfccc.int/process-and-meetings/the-paris-agreement/2018-talanoa-dialogue-platform>

## Gender Matters in Emergency Education: A Reflection on Effects of the 2004 South Asian Tsunami on Women and Girls

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### **Abstract:**

Disasters, however, natural, occur in highly gendered contexts because women, men, girls, and boys face different threats, risks, and have different responses and coping mechanisms for crisis and displacement (INEE, 2018; Kweifio-Okai, 2014). In many contexts, due to socio-economic conditions as well as the cultural beliefs and traditional practices, women and girls are more likely to be affected by disasters, including loss of life and increased GBV (gender-based violence), sexual harassments, household burden, etc. after the disaster (UNESCO, 2019). How men and women respond to a disaster is actually related to their existing gender roles, relative socio-economic status and political power differentials in pre-disaster situations (Kumar & Ranger, 2001). Education as a powerful tool to advance gender equality is particularly important to be utilized to mitigate the risks and secondary harm given to women and girls. It plays a pivotal role in developing human beings' resilience, strengthening social cohesion, and empowering vulnerable groups of people. While a wide range of researchers and scholars are making progress towards documenting gender-related risks after the disasters and analyzing the education in conflict and emergency in a gender lens, the availability of rigorous evidence on what works on gender and education remains severely limited (Oxfam, 2008; INEE, 2018).

There is still little accurate and sufficient sex-segregated data to facilitate gender-related research, for instance, how many of the dead were specifically women, or how many of the girls drop out of school in the aftermath of disasters. This paper, therefore, brings this critical issue to the public's attention and raises awareness about how and why emergency and conflict situations would be experienced discriminately by women, girls, men, and boys, along with the way to utilize education to mitigate the negative influences brought by conflicts for women and girls. A few months earlier, a magnitude 7.5 earthquake struck Indonesia's Central Sulawesi province on September 28, 2019, triggering a tsunami and landslides that caused more than 2,000 people lost their lives, and 4,400 are seriously injured, according to the Indonesia disaster management agency (2018). In addition, as you recall, 2004 saw another devastating tsunami in South Asia, which killed at least 225,000 people and caused more than 1.6 million people being displaced (2004). South Asia, is not the first time being heard by the public to suffer from earthquake and tsunami. As one of the most disaster-prone areas in the world, all the member states of the South Asian Association for Regional Cooperation (SAARC) are highly prone to hydro-meteorological and geological hazards such as floods, landslides, droughts, cyclones, earthquakes, heat waves, avalanches and tsunami (ReliefWeb, 2018, Kafle, 2017). Poverty, exposed population, political disruption, governments' corruption, and lack of preparedness can accelerate the deterioration and further widen the wealth gap in South Asian countries such as India, Sri Lanka, and the Maldives. This paper will use the 2004 South Asian tsunami as the entry point to analyze how it has disproportionately affected women and girls in particular. It concludes with general policy recommendation to better inform governments in South Asia to implement gender-sensitive educational and training programme to prevent more women from being impacted in the future disaster.

## Co-Creation Process And Good Practices In Climate Change Mitigation, Adaptation, And Resilience

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### **Abstract:**

This article examines the phases for the adaptation and adoption process of four methodologies: Theory U, Change Theory, Canvas for Social Organizations and Multi-Criteria Evaluation, within the Asset Based Development framework, for the development of measures to adapt to climate change, through co-creation processes with communities and social organizations.

Through an analysis of the potential of these methodologies, a model composed of four phases is proposed: environmental and social diagnosis, capacity building, co-creation of prototypes, consolidation of models for adaptation to climate change and design of mechanisms for social oversight. Through a bibliographic review of each of them that allows to recognize their potentialities and environmental and territorial possibilities

As examples of good practices in climate change mitigation, adaptation, and resilience this article shows two experiences are presented: the design of the model " Finca Climáticamente Inteligente del Piedemonte Amazónico" designed and developed by the organization CORDESPA (1) , "Corporación para el Desarrollo Sustentable del Piedemonte Amazónico". that develops its activities in the department of Caquetá, Colombia. This experience was part of the Community Innovation Laboratory of Piedemonte Amazónico (LIC) since 2015 (2). This initiative was designed to respond to organizational strengthening needs by taking the organizations to a tripartite reflection including the human being perspective (type of leadership of each of its social leaders), the organization as a human group (coherence between Value Proposal and the way the organization operates) and the proposal of its daily work for the beneficiary territory.

The second example describes the process developed with students of the Faculty of Engineering of the Universidad Santiago de Cali, located in the city with the same name in Colombia, with whom a process of co-creation of adaptation measures from the perspective of engineering and the design of prototypes that responded to the post-conflict in Colombia and its social and environmental implications.

The development of prototypes of the intervention proposals through on-the-job learning contributed to knowledge management in the three levels previously mentioned.

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(1) [www.cordespa.blogspot.com](http://www.cordespa.blogspot.com)

(2) This experience is part of the Programa de Conservación y Gobernanza del Fondo Patrimonio Natural. Bogotá Colombia, which took place in the department of Caquetá, Colombia

[www.patrimonionatural.org.co](http://www.patrimonionatural.org.co)

## Good Practices in Sustainable Food Production

### Consumer Preference And Willingness-To-Pay For Bio-fortified Sweet Potato In Osun State, Nigeria

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**Abstract:**

The widespread economic downturn in Nigeria has led to increased poverty and severe cases of malnutrition among the teeming population. Despite the increase in awareness of the superior nutritional value of Orange Fleshed Sweetpotato (OFSP) to human health and industrial need, many Nigerians are still indisposed to its consumption. Hence, this research examined the consumer preference and willingness-to-pay (WTP) for OFSP, considering its various attributes and determined the factors that influenced the consumers' WTP.

Multi-stage sampling technique was adopted to arrive at a sample of two hundred and forty OFSP consumers that participated in the experiment. The study made use of both primary and secondary data. Primary data were collected on socio-economic factors such as age, consumption behavior and household size; while secondary data that were obtained from National Root Crops Research Institute, Umudike included information on beta-carotene and dry matter contents of the OFSP roots. A boiled and fried OFSP were made from 3 varieties ( Umuspo 3, Umuspo 1 and Umuspo 4) and respondents were asked to taste them. A 5-point hedonic scale was used to evaluate the sensory attributes (color, texture, dry matter, beta-carotene, aroma and taste) of OFSP products. Data on socio-economic characteristics of respondents and their WTP for OFSP were analysed using descriptive statistics, while mixed logit regression was used to analyse factors that influenced the consumer WTP for OFSP and hedonic regression analysis was used to determine consumers' preference for OFSP attributes.

The results showed that 95% of the respondents consumed sweetpotato with 60% having knowledge of OFSP. Ninety one percent preferred Umuspo 3 to the other two varieties and were willing to pay the price of ₦112.7 per kg. The mean hedonic scores were significantly different between the pairs of Umuspo 3 and Umuspo 1; Umuspo 3 and Umuspo 4 and Umuspo 1 and Umuspo 4 ( all at  $p < 0.01$ ). The hedonic regression of OFSP characteristics for Umuspo 3, Umuspo 1 and Umuspo 4 showed that attributes such as beta carotene ( $p < 0.01$ ), expenditure ( $p < 0.01$ ), aroma ( $p < 0.05$ ) were the attributes consumers' were willing to pay for. The logit regression results for the determinants of Willingness to pay for OFSP showed that factors such as gender ( $p < 0.10$ ), Child under 5years ( $p < 0.05$ ), eye problem (respondents) ( $p < 0.01$ ), source of vitamin A information ( $p < 0.10$ ) and eye problem (other family) ( $p < 0.01$ ), were significantly likely to increase the willingness to pay for Umuspo 3 while factors like education ( $p < 0.05$ ), marital Status ( $p < 0.05$ ), eye problem ( $p < 0.01$ ) and knowledge and source of OFSP ( $p < 0.05$ ) were significantly likely to increase the willingness to pay for Umuspo 1.

In conclusion, more than half of the respondents had knowledge of OFSP and were willing to pay the highest amount for Umuspo 3 due to the presence of beta carotene. Factors such as education, eye problem in the family and source of OFSP influenced the respondents WTP. The hedonic attributes and determinants of willingness to pay were significant at different levels.

## Government-Church Partnership in Promoting Agri-Businesses in Ghana

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### **Abstract:**

Ghana has been identified as a food deficit country and vulnerable to global price spikes for imported commodities. This trend is manifested in high importations of food from abroad to fill the shortfall. In 2018 for instance, the country imported food to the tune of US\$ 2.4 billion. This development could hamper the attainment of the Sustainable Development Goal (SDG) two (2). High levels of investments are required to unleash the potential of agriculture for sustainable development and poverty reduction in the country, however, low public budgetary allocations to the sector have slowed growth. To address this problem, innovative partnerships that bring together business, government and civil society actors are increasingly being promoted as a mechanism for pooling much-needed financing while mitigating some of the risks of doing business in the agriculture sector. Commonly referred to as public–private partnerships (PPPs), these initiatives are expected to contribute to the pursuit of sustainable agricultural development that is inclusive of smallholder farmers.

There are successful partnerships between the government and the church in areas like education, health, housing and others. The church in Ghana is noted for its ability to mobilise both financial and human resources usually at low or no costs. Besides, churches continue to invest in human capital development such as, training and education; health care delivery, real estate and other businesses. The church has potentials to partner with the government in setting up small scale agri-businesses if the right partnership frameworks are developed. The study analysed the government – church (G-C) partnership with the orthodox churches (the Roman Catholic Church, the Presbyterian Church, the Methodist Church and the Anglican Church) and the Pentecostal and Charismatic churches (the Pentecost Church, the International Central Gospel Church, the Lighthouse Chapel International, Action Chapel International and the Assemblies of God Church). Partnership engagements between these two bodies was explored for mutual benefit. The study examined the role played by government in promoting this partnership; whether there are obstacles militating against collaboration; the attitude of churches towards partnership with government for promoting a better society for Ghanaians.

The study employed both quantitative and qualitative methods which was juxtaposed for purposes of triangulation. Data was obtained by administering structured questionnaires and interviews. In the qualitative approach, data was analysed theme by theme in order to generate grounded theory. As for the quantitative approach, means and standard deviations was used to describe data. In order to test hypotheses formulated, inferential statistics, namely; chi-square

and t-test for independent samples was used. Altogether, 250 participants were purposely selected for the study. Our findings indicate that there is potential for successful partnership between the government and the church in promoting agribusinesses in Ghana. However, this study wishes to recommend a better framework for sustainable partnership.

## Responsible Consumption And Production of Resources

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### **Abstract:**

Man, an omnivore and a generalist par excellence is a consumer. Man must eat to enable him carry out his normal activities, duties besides growth. In the process of the consumption, he depends directly and indirectly on ecosystem services which could be provisioning, regulatory, ecological, supporting and cultural. For example, all the food a man eats including cereals, legumes, pulses, vegetables; non-cereal energy crops like cassava, sweet potato, yams and plantain have their origin in plants. The aquatic ecosystems apart from supplying water for domestic, agricultural and industrial uses; are biodiversity hotspots endowed with great treasure and fortunes just like the terrestrial ecosystems. All fishes, periwinkle, starfishes, other non-fish species like several species of shrimps, frog, shellfish, oysters, mussels and crustaceans come from aquatic ecosystems. As a result of high rate of consumption stemming from the world teeming population estimated by W.H.O. as 7.7 billion in 2019, the life support system has subjected to series of devastations from both natural catastrophes and human activities. This paper emphasized that to save the environment our closest neighbor and most richest nature's gift to mankind from further degradation of the rich and exhaustible resources, it becomes inherent to engage in responsible consumption and production which is connected to the goal 12 of sustainable development goals. This goal encourages achieving economic growth and sustainable development by urgently reducing our ecological degradation to achieve environmental sustainability. It is emphasized that earth resources are essential basis for an economy of a country and the well-being of her citizens. Environmental degradation through depletion of resources such as air, water and soil, destruction of ecosystems and endangerment and extinction of species must be minimized by striking a balance between consumption and production. The paper further maintained that ecosystem integrated approach that involves action plan frame work including all and sundry, rural dwellers, government policy makers, community leaders, parents, teachers, NGOs should be adopted. Environmental education at all levels starting from the home, environmental greening, afforestation and restoration as well as establishing conservation centres should be encouraged. The paper concludes that all humans are environmental stewards and should be environmentally conscious as any harm done to it affects even generations yet unborn. It is recommended that responsible consumption and production should be adopted because when the last plant on planet earth dies, the last animal including man also dies.

# Assessment of Financial Services of Project for Financial Inclusion in Rural Areas on Welfare of Smallholder Farmers in Uganda

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## **Abstract:**

Financial inclusion is an innovative concept which helps to achieve the inclusive development of a country, by making available financial services to the unreached people with the help of financial institutions. It is concerned with providing financial and banking services on lower costs to rural people and low section of society. It can be a great weapon to overcome financial backwardness, eradicate poverty and hunger. Linking financial inclusion to sustainability, not less than 7 goals of the Sustainable Development Goals (SDGs) have in their targets financial inclusion, most especially for women, young and rural people in order to achieve the goals by 2030. For instance, goal 1 of SDGs has in its targets by 2030, ensure that all men and women, particularly the poor and the vulnerable, have equal rights to economic resources and financial services including microfinance. It is therefore evident from this that financial inclusion is necessary to achieving inclusive development in a sustainable manner. Researches show that financial inclusion will bring faster and equitable growth. However, there exist a number of gaps regarding the implementation of the financial inclusion drive at ground level so as to sustainably increase access to, and use of, financial services by the rural population in the target area. This study therefore help to assess the credit and financial services of the project for financial inclusion in rural areas of Uganda. The research questions and research objectives are thus formulated to determine the socioeconomic characteristics and households welfare of the small holder farmers in the study area, and also to evaluate the access and use of financial services in the targeted rural areas. Descriptive and analytical research design was adopted to predict financial inclusion of rural households in Uganda. The results generated indicate that socioeconomic and household welfare characteristics are significantly and positively affect financial inclusion of the small holder farmers in rural areas of Uganda. This study therefore concludes that the financial inclusion contribute much to the development of developing economy and access to finance empowers poor farmers to increase their wealth and food production to be able to feed the increasing population.

**Keywords:** Financial Inclusion, Households welfare, Sustainable Development, Small holder farmers, Access to finance.

## Digital Agricultural knowledge support for sustainable development: A developing country perspective

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### **Abstract:**

Agriculture plays a crucial role in sustainable development and in the eradicating of hunger and poverty. It is a multidisciplinary field of human knowledge which need to be captured, stored and shared; because agricultural community of practice depend heavily on knowledge. The current situation whereby documented agricultural knowledge sources' outcomes or findings are presented in varied format including mimeographs, technical reports, conference proceedings, students' academic theses, journal articles, newsletters, magazines and other reprints makes their access and extraction of productive knowledge to varied categories of farmers' needs; complex, cumbersome and may not be sustainable. Better management, involving higher degrees of information and knowledge is required for the coordination and integration of geographical dispersed distribution of agricultural knowledge sources and users. These knowledge from fragmented sources are dynamic and evolutionary in nature and therefore, make its digitization and ICT support a necessity. Digitization can therefore enhance access to disparate agricultural knowledge sources, provide a platform for options and choices that will help individuals and communities make decisions. These include interactive communication to solve their specific problems either at the individual or community level. Qualitative grounded theory approach was utilized as the research methodology. In the study, it was revealed that there is weakly on-demand knowledge support, lack of requisite formal agricultural education, management skill and knowledge for market-oriented farming has remained a major setback to transformation and farmers sustainable development. We proposed an agricultural knowledge support portal-model. In order to cover the entire spectrum of agricultural knowledge support process of farmers, this study has modeled a number of fundamental components such as synchronous and asynchronous knowledge support systems, Interactive services for personalized knowledge support; Virtual laboratory for researchers and expert networking; knowledge bureau for problems presentation and linkage with expert through expert directory; knowledge repository for resource re-use and knowledge sharing; and e-learning or m-learning for formal agricultural education of farmers and their family.

## Farm household decision making on crop diversity in the Mt. Elgon region, Uganda: A participatory system analysis approach

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**Abstract:**

Members of farming households in Uganda need to decide collectively on the crops they want to produce yearly in order to meet their needs in terms of cash and food. This decision making process is characterized by perceived trade-offs among the existing production possibilities. Decisions are further constrained by land, farm labor and capital. We consider the farm and its household as a socio-ecological system and adopt a constructivist approach. In order to gain insights from households about the decision making process, we use an innovative method of participatory system analysis. With a view to empower farmers with limited writing and reading skills to participate, we used collages, instead of words. A collage elicits data using visual representations and offers vast ways of interpretation. In addition, it has rarely been used on farm household related studies. This study was carried out in two sub-counties which represent the low and mid altitudes of Kapchorwa district in the Mt. Elgon region, Eastern Uganda. The study therefore examines how decisions about crop diversity and the area cultivated for each crop are made at the level of the farming household. The collected data consisted of the source (who makes the decisions) and the reasons (what drives the decisions) for the cropping diversity, the constraints, the trade-offs between cultivation options and cropping activities. The connections between the different elements of decision making were assessed as well. First, we collected narratives from individual interviews which we documented with our own pictures and observations. The subsequent system analysis took place in focus group discussions and made use of the pictures taken during the interviews. This research shows how important it is to involve farmers in participatory research if one aims to target the relevant constraints when formulating policies which influence cropping decisions.

Key words: Crop diversity, Collage, Farm household, Participatory system analysis, Socio-ecological system

## Sustainability Measurement toolkits and the challenge of sustainable Consumption : Some Critical Insights on good Practices

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**Abstract:**

The sustainability intervention suggests increasing need to evolve composite indicators to measure sustainable development, mitigate unsustainable consumption and institutionalize good practices. While there are such robust composite indicators and measurement toolkits such as the Global SDG Index, good practice and attainment of sustainable consumption have been less clear. This paper reviews salient sustainability measurement indicators to provide evidence of the daunting challenges of good practices in food consumption. It builds on

debates on the origins and character of the liberal unsustainability practices and argues that dominant theorizations of sustainability measurement rest on a shared assumption of essentially pro capitalist character based on the neo liberal notion. This article challenges prevailing measurement tools as largely uncritical, naïve and less revolutionary as unsustainable consumption patterns and similar capitalist practices of the high income societies of the global North persists. Drawing on critical qualitative and theoretical review, the concepts of “eco-efficiency and ecological footprint” as alternative measurement indicators are prioritized. The paper focuses particular attention on the significance of efficiency in resource consumption as institutional fabric for a more equitable and inclusive strand of sustainable development. It argues that institutionalizing new “sustainability measurement considerations” will facilitate ecological accounting, resource equitability and transformation of the overall sustainability trajectories as useful proxy for reconstruction of sustainability measurement, good practice and the attainment of sustainable development goals(SDGs).

## Development of an integrated model to assess the impact of practices and land use on agricultural production in Morocco under climate stress, over the next twenty years

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### **Abstract:**

Climate change is expected to have a significant impact on agricultural production at local and global scale. Higher temperatures and changes in precipitation patterns projected by the Intergovernmental Panel on Climate Change (IPCC) could cause agricultural production to fall in many areas requiring significant changes in farming practices and distribution of agricultural land. A concomitant factor to climate change will be the increase of the population and its distribution and its level of consumption that also influence the strategies of agricultural production, conversion of agricultural land, the type of irrigation and technology development.

Determine the consequences of these forcings on land use will depend on our understanding of past changes and market forces on the agricultural sector and how future climate change, technology, the type of irrigation, abundance, government policy vis-à-vis agriculture, the size and distribution of the population will affect agricultural production and its relation to the expansion of agricultural land.

It is proposed to develop an innovative methodology that will integrate ground observations, remote sensing, socio-economic and demographic statistics and technology indicators to project the trends and patterns of agricultural land use caused by climate change and human development. A model that relies environmental and socio-economic factors to project their impact on the current use of agricultural land and the potential change of this use over the next 20 years.

## A Strategic Path to Sustainable Development in Ghana: Aaron Tetey Asare Model of Plant Breeding

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### **Abstract:**

With a case study of Professor Aaron Tetey Asare model of plant breeding, this paper examines the role of researchers and inventors in promoting sustainable development in Ghana. The search for sustainable economic growth and development in Ghana commenced in 1957 when the country gained independence. Under the leadership of the first president, Kwame Nkrumah, the nation witnessed unprecedented economic growth and development as a result of high investments in industrial development with the support of development partners. After Nkrumah, was forcefully removed from office in 1966 by the Ghanaian Military, the nation witnessed a significant setback in terms of development which affected all aspects of the society including scientific research and inventions. With the dawn of democracy and the support of the donor community in recent years, Ghana has resumed the path of prosperity. Professor Aaron Tetey Asare has become one of the leading pathfinders blazing the trail of development in Ghana through his groundbreaking new varieties of cowpeas. In collaboration with the Savanna Agriculture Research Institute, the Plant Genetic Research Institute of the CSIR, the University of Virginia in the US, the Ministry of Food and Agriculture in Ghana and some inmates of the Ankaful Prison Service in the Central region of Ghana, Aaron Tetey Asare and his research team has released new breeds of cowpeas that is high yielding, more nutritious with higher return on investment than any other breed of cowpea on the Ghanaian market. This study, therefore, argues for partnership with Professor Aaron Tetey Asare and his team in promoting a more sustainable economic growth and development in Ghana.

Keywords: Strategic; sustainable; development; Ghana

## Conversations with farmers: power dynamics in the vegetable and fruits value chain in Paranaíba, Brasil

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### **Abstract:**

This summer I worked with Instituto Centro de Vida (ICV) in my field practicum as part of my master degree in Development Practice (MDP). ICV has developed the Redes SocioProductivas (Socio-productive Networks) project through which they worked with 14 cooperatives and associations of family farmers across the region with the goal of (5 words at most). The goals of my field practicum were to understand the power relationships among stakeholders and identify those who have important roles in family farming with one of the cooperatives, Coopervila, as a study case. The resulting social network analysis will help Coopervila understand the opportunities that exist in the markets, projects, and political participation. Additionally, ICV will have a clear map of the internal and external dynamics of the relationships between the different stakeholders. The analysis determined the existing relationships among producers, intermediaries, sellers, and buyers in the vegetable and fruits value chain of the cooperative; helped identify the power dynamics that underlie the vegetable and fruits value chain; and proposed alternatives to address the power dynamics and enhance the governance of the Coopervila vegetables and fruits value chain. Additional information was gathered through semi-structured interviews with the head of department of Paranaita's Family Agricultural Secretary, Paranaita's Secretary of Education Nutritionist, and some members of both Coopervila and the ICV team. Likewise, three stakeholder mapping sessions were done with ICV team, the board of directors of Coopervila, and the project managers of ICV as well as a subsequent power mapping with the same actors. Some of the preliminary results suggest there is a different understanding of the governance structure among the different stakeholders, and the perception of power.

## Does Korean Secondary School Education Translate into Environmental Awareness & Protection Effort to address the Global Food Crisis?

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### **Abstract:**

Because of global climate change and exponential population growth, the global food crisis is no longer a distant reality. Therefore, this research investigates the effects of Korean secondary school education: How encourages adolescents to put their learning into action to protect their environment and to be aware of the global food crisis. The data from 2018 Survey of the Korean Society collected by Statistics Korea was used. After eliminating adults and those who were not in secondary schools, the responses of the remaining 2,292 people were analyzed via Pearson's Correlation and multiple linear regression analyses. The result revealed that the secondary school education explains the change of the adolescents' protection effort. The environmental awareness seemed to translate to actions. Lastly, Korean secondary education seemed to raise environmental awareness and to encourage their students to put their learning into action; however, the education fell short of helping them see the looming food crisis.

## Methods of Sustainable Agriculture in the scope of expanding farmer's production activities.

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### **Abstract:**

Sustainable food production is basically the concept of encouraging eco-friendly methods of food production which just does not help the environment but also to strike a balance between the environment and transfigure human lifestyle. It can be achieved by promoting local farming methods for example polyculture of crops and agroforestry and techniques in equilibrium with urban lifestyle and conserving resources. Encouraging farmer's potential and making an enterprise that gives good profitable margins to farmers by lessening import of various produces can help them as well and making farming practices ecologically sound. The most essential part of the paper would be to make analysis on the most possible methodologies that could encourage independent local food production of regular as well as exotic production by linking them to higher-value export markets. Small land holding farmers needs more productive, pest-tolerant and nutritious options which are highly recognized in the market and potential opportunities is possible to be made on this aspect.

Sustainable Development, being a widely used term now has seen various kinds of practices in agriculture sector for better living by highlighting the pertinent methods of food production and making this biodynamics to fulfill some of the major SDG goals like zero hunger, good health and well-being, clean water and affordable and clean energy. In case of Asia and many other Pacific countries, farming accounts to a very suitable percentage in growth of GDP and thus farming support systems are to be made viable in the long term. Lastly the aspect of food loss prevention also comes under this and ways and policies that can reduce the loss in association with social awareness, business sector engagement, stakeholder participation and policy reformations will be an insight of the paper too.

Sustainable food production is an essential aspect that has many possible threats in the contemporary times which are to be encountered now as it can help reduce scopes of poverty, hunger, unemployment, malnutrition and many others and can improve the quality of life for various sections of the society.

## The Economic Empowerment of Women Small-Scale Sunflower Farmers in Tanzania: A Singida District Case Study

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### **Abstract:**

As the Tanzanian economy continues to grow and move towards economic independence, the government has placed focus on increasing sustainable domestic production of agricultural goods. One of the largest sectors included in this push is edible oils, specifically the government's efforts to increase sunflower cultivation for the production of sunflower oil. These efforts have included an increase in training, grants, and research in the sunflower industry. While these actions have seen positive results, one important factor has consistently been left out of the conversation of developing the sunflower sector - the inclusion of women sunflower farmers, who are responsible for the majority of sunflower cultivation. This study aims to give these women a voice on the policy stage and subsequently advance their societal and economic stance, addressing the Sustainable Development Goals 5 (Gender Equality), 8 (Decent Work and Economic Growth), and 12 (Responsible Consumption and Production). In order to do this, a survey of 72 questions was conducted with 117 participants (55% female, 45% male) from the Singida District of Tanzania. The answers given by these participants offer insight into 1) the challenges experienced by both men and women; 2) the difference in participation levels between men and women; and 3) disparities in economic freedom and personal agency between men and women. Using the information gained from the data, this report provides holistic recommendations concerning how to combat the common obstacles faced by sunflower farmers, the creation of programmes that facilitate women's economic empowerment, and innovative approaches to encourage women's participation in the decision-making process. This research is part of a larger study on the economic advancement of women within growing agricultural sectors. By focusing on women sunflower farmers in Tanzania, this report gives insight into the relationship between gender disparities in agriculture and sustainable development while offering the perspective of those who are too often excluded from the development platform.

## Learning the value of vaccine while integrating gender perspectives in the livestock sector in Nepal

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### **Abstract:**

Livestock has become one of the main livelihoods that significantly contributes to the well-being of rural households. Although sustainable livestock production and responsible consumption remain a challenge, enhanced technology could help to mitigate the trade-offs arising between economic growth and development goals. In Nepal, the agricultural sector still provides the largest labor demand where animal husbandry shares an important role in the sector. Women hold control in managing livestock, especially small ruminants such as goats and sheep, that allow them to partake in the improvement of the quality of the family's life. While Peste des Petits Ruminants (PPR) vaccine has been advanced over the past three decades, the disease continues to be one of the major constraints in livestock management. Accessibility –

available but hard to access – and availability – ease in access but unavailable when needed – are ones of the most contributing factors that influence the adoption of vaccines. Moreover, the lack of facilities and infrastructure could jeopardize the implementation of the immunization program. Without addressing the barriers properly, not only it will be unlikely to achieve the global goal – to eradicate PPR by 2030 – but also it will worsen the long-lasting reality where gender and power dynamics at the ground level have been existing. Analyzing the livestock vaccine value chain could assist to identify related and relevant stakeholders and to map how they interact and coordinate with each other. Recognizing women's capability and encouraging them to actively engage will present an opportunity to increase the positive impact on the application of livestock vaccine that could have an added value to livestock keepers. A community-based animal health worker (CAHW) could potentially act as an agent that promotes the strong connectivity of the value chain. Understanding the perception of the sector's stakeholders about the utilization of livestock vaccines insert great input in the value chain.

## Crop Rotation and Diversity Practices Among Rural Farmers of Ebonyi State, Nigeria

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### **Abstract:**

This study examined crop rotation and diversity practices among rural farmers in Ebonyi State, Nigeria. One hundred and eighty rural farmers were selected for the study using multi-stage sampling procedure. Data for the study was collected with the use of structured interview schedule and analysed using descriptive statistics, trend analysis and multivariate probit model. Results showed that 83% of the rural farmers are not aware of the cropping system rather they practice shifting cultivation. Majority (80%) of the rural farmers in the study area do not practice crop rotation and diversity. It was further shown that a significant difference exists in the average annual income of the same land size for adopters (N886, 848.68) and non-adopters (N364, 426.82) of crop rotation and diversity in the study area. Only 12.22% adopted crop rotation and diversity. Majority of the farmers 61. 11% had farm size between 0.1-1.9 hectares which could have supported sequential and systematic rotation of diverse crops as required by sustainable crop rotation and diversity to improve the farmers' annual income. The study showed that the farmers' socioeconomic and traditional characteristics significantly determined



the different cropping systems adopted in the area. The study showed that the majority of the farmers (50%) had no formal education which actually buttressed the fact that majority of the farmers are not aware of good cropping system let alone adopting it. Interestingly majority of the farmers (72.22%) were females who have little or no authority to adopt any new cropping system on their own except as practiced in the state. The study showed that most of the farmers had large (44.45%) house hold size of 11-15 persons who mostly supply farm labour. Majority of the farmers (66.66%) practice mono cropping agricultural system which is not unconnected with the traditional belief in the state that mono cropping gives better yield. In addition, the study showed that 61.11% of the farmers are within the age range of 51-60 years. This shows that farming group in the area consists of old persons who are neither eager nor interested in adopting sustainable practices such as crop rotation and diversity. The major constraints identified for non-adoption of crop rotation and diversity by the farmers were, among other things, lack of: knowledge of good cropping systems, extension service delivery, demonstration plot by the universities and research institutions, university outreach programs; scarcity of land, erroneous traditional belief and fear of failure. Based on the result of the study, it was then recommended that working on farmers' socioeconomic characteristics through advocacy, establishing demonstration plots to help improve the knowledge and awareness of crop rotation among rural farmers and educating the main stakeholders against unfavourable belief can help to improve farmers' adoption of crop rotation and diversity.

Keywords: assessment, crop rotation, diversity, rural farmers, Ebonyi State, Nigeria

## Enhancing Food Security in Crisis Contexts: Best Practices from Kenya, Venezuela and Costa Rica

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### **Abstract:**

RET is an international NGO committed to protecting and meeting the needs of young people made vulnerable by displacement, violence, armed conflict and disasters. In its efforts to do so, RET seeks to find ways in which people in crisis contexts can contribute to their own food consumption, to provide them with a nutritious and diverse diet in a sustainable manner. This abstract will elaborate on some of our recent experiences in this regard in Kenya and Venezuela. RET's approaches in such programmes are twofold: not only do they increase the food security and livelihoods opportunities for the most vulnerable, but they also aim to enhance social cohesion by bringing different groups in society together.

In Kenya (where RET has worked since 2004), RET trained youth in the Dadaab refugee camps in Kenya to improve food security for the refugee and host communities. This response was



specifically tailored to the dry and non-fertile lands of the camps. RET selected adolescents and youth as new farmers to be trained by the government. This training was focused on the '3 R's': Reduce, Reuse and Recycle. The training emphasised ways to use household waste, such as waste water and compostable products, to produce vegetables for consumption. These young farmers then successfully planted tomatoes, vegetables and water melons, allowing them to supplement their WFP food rations and hereby increase their food security, as well as to generate income from the sale of surplus vegetables.

RET has worked in Venezuela since 2015, and since 2018 one of its interventions aim to address the urgent needs of vulnerable Venezuelans. As part of its comprehensive approach, RET provides access to food through creating and strengthening family and community gardens that produce nutritious food. In this process, the creation and application of organic fertilizer is strengthened, and RET encourages the growing of certified seeds. RET also provides an alternative cooking programme, which allows families to use what is produced in their gardens and to improve the nutritional value of their food.

In Venezuela, the creation of community seed banks ensures the sustainability of RET's food security & nutrition intervention strategy, together with the training that is provided to build the capacity of the local community. The programme therefore not only addresses the food shortages in Venezuela, but also contributes to community members' understanding of how to produce their own food, hereby enhancing their food self-provision on the long term.

Finally, in both Venezuela and Costa Rica (where RET implemented a similar project), recipe books were created with the objective of providing participants with creative ideas for nutritious food, but also to strengthen ties of collaboration, mutual understanding and social cohesion. In this regard, in Costa Rica, a group of refugee young women and women from various countries attending a psychosocial support group (supported by RET), decided to start cooking together, and to use the cooking time to socialise, share experiences from their home countries, teach each other about different traditional country's recipes, which in turn led to discuss about their own stories of life. Their recipes book with their best tested cooking ideas can be found using the following link: <https://issuu.com/retinternational/docs/recetario-diamante-azul>

## "Rural Nepali Women's Empowerment Through Application Of Proper Agricultural Practices"

**Submitter: Mahmoud, Esraa**

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**Abstract:**

Poverty alleviation cannot be achieved in any developing country unless women are included and associated with mainstream development. In Nepal, women's position, especially that of rural women, lags far behind that of men. With the recent surge of male citizens working abroad, women have become increasingly involved in agricultural practices. However, women often do not have the same access to land, seeds, water and training that their male counterparts do. Agriculture plays a vital role in understanding the "big picture" of rural women's lives in Nepal and addressing issues of poverty, gender equality, and sustainable agriculture development. In Nepal, most citizens are involved in some level of agriculture and it accounts for a large portion of the country's GDP. Even with this high production rate, the country struggles to produce adequate food for all its citizens, resulting in wide-spread chronic malnutrition and stunting among children. Sustainable agricultural enhancement has been used as a means to socially and economically empower women and address issues of development throughout the world.

Women Acting Together for Change (WATCH), has committed to grassroots level initiatives that support self-sustainable community development and agricultural practices. This summer, a group of Master of Development Practice students from the University of Minnesota will partner with this local NGO to address women's agency through agriculture development among women's groups. Our project will consist of researching and understanding the social, environmental, and economic factors influencing the agriculture systems to identify the desires and interests of rural women engaged in agriculture. With the help of an interpreter, we will conduct a needs assessment, focus groups, interviews and observations in our regions of concentration: Okhaldhunga, Lalitpur and Kapilvastu. The information gathered will permit us to not only develop a deep understanding of agriculture and the women's groups involved, but will allow us to create useful tools such as concept maps and theories of change. Using these tools, we will then work with WATCH to identify key points of intervention and opportunities for sustainable and responsible agricultural expansion. Consequently, we will develop an implementation plan based on our findings. This plan will contain interventions that address the sustainable development goals of poverty, hunger, health, and gender through responsible agricultural practices. We aim to use this plan as a reference point and tool in supporting WATCH's goal of empowering women economically and socially, and enhancing their agency within the Nepali society.

This summer, we intend to build and expand on our qualitative and quantitative skills as well as acquire a new field experience. We aspire to present on our identified interventions and the processes we used that resulted in practical pathways to address poverty, gender equality, and sustainable agriculture development among rural women in Nepal. In addition, we aim to elaborate on how these pathways could affect Nepali women's social and economic empowerment.

## Seeking a 100% Coffee Cup-of-Coffee: Coffee in Burundi (a possible case-study)

**Submitter: Mathews, Andrew**

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### **Abstract:**

Each day most Burundians earn less than a cup of coffee costs in the United States. And, what does the coffee they export cost them??? Google Burundi and check out the Wikipedia page... Poverty, Hunger, Health, Gender Inequality, Social Responsibility (all issues this case-study hopes to address through sustainable production.)

Approximately 90% of Burundians work in agriculture, and roughly 90% of the country's exports are coffee and tea. Burundi is at serious risk. Diversification of crops can help.

Starbucks, McDonald's, Coca-Cola, and others recently had a consortium to brainstorm ideas for more eco-friendly coffee cups (The liner on the paper cups is actually polyethylene and not truly biodegradable.)

My idea was (and still is) to make a 100% coffee cup-of-coffee. The waste products created in processing coffee can be used to create the fiber for the cup, the liner, and the lid. There is plenty of fiber (for paper), wax (for liner), and sugar (for seam glue). My goal is to make this product a reality.

This product could potentially eliminate vast quantities of environmental waste (in Burundi and abroad) as well as create new revenue streams for Burundians. A campaign for this cup could be used to create awareness regarding the numerous issues challenging Burundi.

I am a Postbac Premed student and I can tell you, change, coffee, and community health go hand-in-hand.

A former student from my program is Deogratias Niyizonkiza with Village Health Works. He is working to build a Hospital in Burundi. It would be an honor to work with Deo's community to create a product that can create jobs, educate, allow for crop diversity to improve nutrition and the soil, repurpose potable water, and even provide for the hospital.

The best affordable healthcare begins with clean water and good nutrition. In Burundi, creating good practices in sustainable food production can help with this, and this begins with coffee.

Pursuing the 100% coffee cup-of-coffee could help to realize multiple social, environmental, economic, and sustainability objectives throughout the value chain.

Change begins with coffee, and revolutions begin at the café. Trade shots of espresso for shots of vaccines - The War on Poverty, Hunger, Health, Gender Inequality, and Social Responsibility is on!

## Detection of Surface Defects on Fruits with the Use of Image Processing

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### **Abstract:**

This project presents an analysis on the methods that use image processing techniques to detect quality and severity of defects at different stages of tomato and bell pepper, from digital images in the visual spectrum. Methods that explore surface defects in fruits caused by fungal growth, which ensure effective inspection, grading and sorting of tomato and bell pepper in order to guarantee timeliness and remove the drudgery of the human eye.

The instruments used to carry out this project work include; a high resolution camera, a computer, Adobe Photoshop (computer software), Mathematical Laboratory (computer software), notepad and a light-box. Images were acquired with the aid of a high resolution camera and pre-processed removing all background using Adobe Photoshop. An algorithm written in the Mathematical Laboratory was developed with the k-means clustering method in addition to noise removal features which were incorporated on the images. The algorithm was used to segment the fruits of different stages showing the defected surface area.

The results show a percentage increase in the defected area of tomato at five stages (4.9%, 7.5%, 12.5%, 26.2% and 30.9%) respectively of fungal growth. Also, a percentage increase in the defected area of bell pepper at two stages (17.9% and 21.3%) respectively of fungal growth. The detection of surface defects caused by fungal growth on tomato and bell pepper with the use of the k-means clustering algorithm and principle of image processing is an efficient alternative to the human eye for quality inspection, grading and sorting in the food industry.

Further research should be conducted and new approaches employed using this technique to improve the quality of food for local consumption and international trade, especially in developing countries.

**Keywords:** Image processing technique, quality, algorithm, fungi, fruit.

## Revised Standards & Best Practices for Regional Living Archives

**Submitter: Merliss, Jessica**

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**Abstract:**

An increasing number of biodiversification initiatives are emerging with the shared, altruistic mission of preserving threatened forms of life. This trend seems to imply a certain optimism about the future of our planet; that by sustaining threatened species and rejuvenating those that are rediscovered, we might somehow prevent the inevitable decline of certain flavors, the sedation of our sensed Cultural memories. However, without a strong and unified methodological approach to the creation and maintenance of regional, living archives, seed-saving initiatives are merely what affect theorist Lauren Berlant calls acts of “cruel optimism.” What results from raising awareness about the general disinterest in biodiversity is, naturally, the establishment of more projects dedicated to cultivating biodiversity. However, this activation of community engagement will eventually, and inevitably, mutually impede the growth of any seed bank within the same region. It is too often the case that archives would rather self-interestedly compete with one another than collaborate and disseminate information out of a greater, mutual sense of duty to the public. With the growing number of living archives, it is imperative to develop a set of best practices to address the potential for mutually beneficial, economic and academic alliances in regional, seed-saving communities. For today’s seed-banks to truly fulfill the ethical responsibility they purport to, there must cease to be a division between living archives dedicated to saving and protecting, and those dedicated to studying and selling. Farming and gastronomy intersect where the balance of power between man and nature is at an equilibrium, and the same can be said of preservation and propagation. We must turn away from the optimism of propagation without care for specialization, and similarly, we must turn away from the pessimism of preservation efforts that have grown so specialized they’ve become apocalyptically associated. What makes a seed-bank so crucial to the sustainability of our Culture is not the actual utility it offers in preventing a foodpocalypse—as much as the Svalbard Global “Doomsday” Seed Vault would like us to believe. Rather it is through our sensory perceptions of agri/Culture, through the language of flavor, that regional identity is created.

## Addressing soil erosion by improving soil quality for sustainable food production and better food security through conservation agriculture

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**Abstract:**

Approximately 50% of the earth's terrestrial land is devoted to agriculture and only about 30 % of agricultural land is allocated to croplands. Currently, about 80% of the world's agricultural land suffers moderate to severe erosion, while 10% experience slight erosion. Soil erosion is a two-step process that involves (1) the detachment of soil particles due to kinetic energy of raindrops and (2) transportation of those soil particles from one place to another by either water or wind. Soil erosion is a global phenomenon that directly affects national food security through reduced agricultural food productivity and sustainability. Croplands are more susceptible to soil erosion due to frequent cultivation of the soil and constant removal of crop residues. Consequently, the soil water availability and nutrient status will be reduced and plant productivity depressed. Approximately 10 million ha of croplands are abandoned each year globally due to poor productivity caused by severe soil erosion. Generally, the perils of soil erosion have led to soil loss from agroecosystems being 10 – 40 times faster than the processes of soil formation worldwide, exacerbating the problems of food insecurity. Food security exists when all people at all times have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. In the current global population estimated to be about 7.5 billion, the World Health Organization and Food and Agricultural Organization report that 1 in every 9 persons is food-insecure and two-thirds is malnourished. Food and nutritional security challenge can be addressed by adopting sustainable agricultural techniques that improve soil quality and crop productivity such as conservation agriculture (CA). Conservation agriculture is climate-smart and sustainable land management technique that was founded on the following three principles, 1) minimum soil disturbance, 2) permanent soil cover, and 3) crop rotation. The goals of CA are to optimizing the crop productivity and farm income through maximizing the use of available resources and their effective recycling in the agroecosystems while arresting the adverse impacts on the environment. In addition, CA is grounded on the principles of soil rejuvenation, envisioned to maximizing the use efficiency of agricultural inputs e.g. seed, nutrient, water, energy, and labour leading to higher profits to the grower. CA has the potential to produce more food from i) less land ii) per drop of water, iii) per unit input of synthetic chemicals and, iv) per unit of carbon emission. However, CA alone cannot solve the problems of food insecurity and therefore should be supplemented with other sustainable agricultural practices. Any practice that seeks to prevent soil erosion and mitigated its effect must be site-specific and its recommendation must not exclude inherent soil properties and climatic conditions of that particular areas. Most importantly, the challenge of soil erosion must be addressed by integrating and adopting innovative knowledge from various disciplines and diverse stakeholders with the political will as a driver of the process.

## The Contribution and Challenges of Family Agriculture in the Practice of Sustainable Development in Brazil

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### **Abstract:**

This dissertation examines the impacts of the agricultural production of foods in the environment considering that this production have to rise due to population increase causing in most cases intensive cultivation of monocultures, with excessive use of fertilizers, biodiversity losses, deforestation, groundwater contamination, etc... Mainly in Brazil that it has 60% of its territory consisting of natural vegetation is necessary to search for more sustainable production, therefore will be evaluated a family farming as a more sustainable form of production meeting present needs using a more sustainable form of production while provide less space for cultivation, diversity of plant species in the crop and the less use of industrial inputs such as pesticides. Brazil is now one of the countries that use pesticides the most in the world. At the same time, the present study will evaluate the diversity of Brazilian family agriculture, which includes families living in extreme poverty as producers inserted in the modern agribusiness, showing that the agricultural cooperatives are the way for these poorer producers to excel. The time period studied in this dissertation includes a visitation of family farmers who participate of agricultural cooperatives in the state of Ceara in Brazil. Data were collected from published files and reports. In particular, we have shown that despite the government's incentive to purchase products from family agriculture for the national school feeding program and the preference for producers selling organic products, this farmer does not have access to the final consumer to sell his production, in addition they do not have ample access to techniques of sustainable production. In this way, it is necessary to raise awareness among the population to buy products from family farmers, as well as greater government investment in free courses of sustainable production and technology that can be used by these small producers.

**KEY WORDS:** Family farming, Sustainable Agriculture, Agricultural Cooperative, Food Production.

## The influence of agricultural interventions on food security, dietary diversity and nutrition status in northern Senegal

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### **Abstract:**

## Introduction

This research, undertaken with Millennium Promise, focuses on the influence of agriculture cooperatives on food security, dietary diversity and nutrition status in the Leona commune in northern Senegal. The commune is divided into two sub-zones: (a) the Niayes and (b) the Dieri. The Niayes is a narrow (5 to 10km) coastal strip of land that is characterised by irrigated commercial vegetable farming and fishing. The Dieri is located to the interior and is characterised by rainfed field crops such as peanuts and cowpeas, as well as livestock production.

## Methodology

Mixed methodologies were utilised in this research, which included both quantitative household surveys ( $n = 360$ ) in 82 villages and health post data from each subzone ( $n = 2$ ), alongside qualitative semi-structured interviews ( $n = 10$ ) with key informants from the agricultural sector. Households were randomly sampled.

## Results and discussion

There were 118 cases of child ( $<5$  years) malnutrition in the Leona commune; 110 (93.2%) in the Niayes and 8 (6.8%) in the Dieri ( $p < 0.001$ ). 96.7% of households grow crops, with beans (58.1%), onions (52.2%) and peanuts (51.1%) the most widely grown ( $p < 0.001$ ). Beans (86.9%) and peanuts (81.9%) are grown primarily in the Dieri, while onions (94.2%) are more commonly produced in the Niayes. Households in the Leona commune consumed 8.6 food groups (out of 12) in the previous 24 hours (according to the HDDS).

Almost all households consume Cereals (typically rice) and Fish & Seafood, while consumption of Legumes Nuts & Seeds is more common in the Dieri (57.5%) compared to the Niayes (24.5%) ( $p < 0.001$ ).

Further analysis is required, but there is need to investigate a potential correlation between the significant differences in the cases of child malnutrition in the Niayes compared to the Dieri as well as the consumption of (plant) proteins between subzones.

## Integrated Innovative Technologies and Empowerment Program for Rural Schools & Communities of West Kenya

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**Abstract:**

Under-development and poverty are visible throughout west Kenya, despite a comparative good climate and intellectual capacity, learned persons that the region possesses. This can be partly attributed in some way, to lack of empowerment of the local people to uptake modern innovative technologies that are able to improve their quality of life in the current modern digital world. Improved soil and environmental management systems creates new options for climate change adoption and mitigation and are able to contribute to sustainable intensification of agricultural production, which is critical for achieving food security and reducing poverty, while protecting biodiversity and maintaining vital ecosystem services. Over the years, scientists and other professional have developed and published plenty of new and adaptable technologies, but some of these ideas and technologies never reach the target groups, or are never taken up by the communities. Various research activities have also been undertaken but many still remain invisible on the ground. It is in this regard that this concept intends to take a different approach, by integrating the various components in its activities, with the main purpose of community empowerment and technology transfer. The aim of our study is to set up and equip information resource centers in selected schools to facilitate skills development and appropriate technology transfer that will not only educate and empower students, but improve the economic status of the communities. This Program is in response to the dire need to involve and guide local and young people, in finding solutions themselves to address the perennial environmental and economic problems; hunger, poverty, quality education, good health and well being towards achieving United Nations Sustainable Development Goals; 1, 2, 3, 4,7, 8 and 13. In the selection of community members, priority will be given to women.

The program will run for 4 years, proposed to commence on 1st September 2018 and end in 1st February 2022 with an initial six months pilot phase and will be implemented in 11 selected schools in West Kenya.

The project will have two phases of implementation, the (PP)Pilot Phase (six months) and (FPP) Full Project Phase (four years), and shall have separate components and activities. (i) Environmental conservation and (ii) establishment of a resource center complete with ICT equipments, internet access and training. The duration of 4 years will allow for achievements of targeted objectives, management of trees planted and provide concrete analysis of impact. Each of the objectives will be evaluated periodically using SMART method, or follow a reporting procedure that maybe requested by a donor.

Key words: Technology, Environmental conservation, Food security, Schools, Research.

## A Story of an Urban Garden

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**Abstract:**

Urban agriculture is a growing trend in many cities across the United States. However, soils in urban areas are commonly contaminated, a legacy from paint, gasoline, incineration, etc. and ongoing resuspension of contaminated soil. Trace metals found in soils of urban gardens may pose risks to human health directly through soil ingestion and inhalation, and indirectly through consuming contaminated garden produce. The current study was conducted in an urban garden in Brooklyn, NY (USA) where elevated lead (Pb) and arsenic (As) were present in the soil. The objectives of this study were to: (1) evaluate the effectiveness of amendments and importation of clean soil on the bioaccessibility and phytoavailability of Pb and As in soil; and (2) assess the potential exposure of community gardeners to these metals. Field plots were established with three different treatments (bone meal, compost, sulfur), as well as an unamended control, and common vegetables were planted. The soil total, bioaccessible and phytoavailable fractions, as well as plant tissue concentrations of Pb and As were measured. Bioaccessibility of Pb was significantly reduced ( $p < 0.05$ ) by all three treatments: bone meal – 24%, compost – 23%, sulfur – 24% compared to the control – 33%. In contrast to Pb, As bioaccessibility not affected by treatments and was high among all the plots ranging from 93% in the untreated soil to 92% in soils treated with compost, 82% in soils treated with sulfur and 80% in soils treated with bone meal. Plant type was the most significant factor determining the concentrations of Pb and As in the edible parts of vegetables, having a greater effect than the various amendments. The median concentrations of Pb and As varied by crop as follows: onion > kale > eggplant > cabbage > tomato. A neighboring plot with clean soil in raised beds had much lower Pb and As levels in the same types of vegetables. Results show that despite years of research on the soil chemistry of heavy metals, highly contaminated sites still pose a significant risk to urban gardeners.

## Understanding the Effect of Lack of Access to Adequate Food Supplies in Mexico

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**Abstract:**

Food production has been a great problem for many developing countries. Many countries with low economic status have a hard time providing their people with cost-efficient food supplies. Thus, various studies have been conducted to examine methods of sustainable food production and how this sustainability can help public health issues caused by lack of nutrients. Mexico has been facing such problems as well, at least “10 percent of the population in every Mexican state suffers from inadequate food access” (O’Toole, 2016). In 2008, it was found that at least 18.2 % of residents in Mexico were dealing with food poverty. This lack of food not only brings hunger, but health problems as well. Without sufficient nutrient intake, there is a high chance of public health problems. However, in 2017, the Thomson Reuters Foundation (TEPIC) announced that Mexico’s ancient cultivations “could hold the key to sustainable food production as climate change bites” (Hares, 2017). Rather than using genetic manipulations to develop sustainable food production, ecologists found that Mexico’s native crops such as tomatoes and maize could become easily accessed food supplies. This study will analyze the different health problems that Mexico’s people face due to insecure food access and how, in the future, Mexico’s native crops could become the key to sustainable food production.

## Diffusion of innovation and Spread of Green Revolution in Bangladesh

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**Abstract:**

Innovations happen because people attempt to suit the innovation to change their economic and social settings and if they find the innovation compatible, then they go for adoption. Rapid or slow adoption and ultimate diffusion of innovation largely depend on the attributes of the innovation. Most advances have been made in generating high yielding varieties which are part of the so-called Green revolution technologies. The main objective of this paper has been to examine the extent of adoption with the Green revolution in Bangladesh and analyzes the variation in adoption in Bangladesh. The key motivation of this study is that, despite their perceived advantages in raising productivity, the diffusion, and adoption of such varieties remains low. I apply a conceptual framework based on S curve which approach to data obtained from three districts in Bangladesh to assess the patterns of adoption of improved rice varieties and their determinants. The data was collected from primary and secondary sources. Using E.M. Rogers’ S curve concept, I found that HYV rice productions, fertilizers use , pesticides use , distribution of improved seeds and irrigation system did not follow this theory to establish

agricultural growth in Bangladesh but maximum figures shows that the adaptation process of green revolution in three districts was quite near with E.M. Rogers' S curve concept. I also examined all data through Stata statistical software. According to the R –squared value and F statistic we say that the model is a good fit and thus we may reject the null hypothesis. The model suggests that the diffusion of the new technology has the potential for raising the HYV production, used fertilizer, improved seeds, irrigations and pesticides used. Regression results suggest that the new technology have a significant positive impact on the production rate but improved seeds had no significant impact on the production rate of Bangladesh.

## Fleet Farming: Converting Lawns to Urban Farms via sharecropping

### **Submitter: Perry, Lee**

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### **Abstract:**

Fleet Farming is an urban agriculture program of IDEAS that is changing the cycle of local food systems through community supported agriculture. Our mission is to increase local food accessibility, creating a healthier and more connected world. We do this by transforming backyards and front lawns into mini-organic farms, called farmlettes. In exchange for long-term land use, residents receive a percentage of the harvest. Fleet Farming then uses zero-emission bicycles with trailers to maintain, harvest, process and distribute the produce to local restaurants and SNAP (Supplemental Nutrition Assistance Program of the United States Department of Agriculture) certified Farmers markets. Revenue from produce sales finance the training and employment of neighborhood farmers while stimulating the local economy. Our focus is creating microfarms in low to moderate income communities and we value our model as a solution to food deserts. Community members can engage in urban farming through free educational farming bicycle rides called "Swarm Rides" that are open to the public. Fleet Farming is working towards addressing food insecurity by growing farms on residents' lawns and empowering the community by restoring gaps in basic needs. Fleet Farming serves the communities of Central Florida, having farms in the neighborhoods of Audubon Park, Winter Park, Parramore, and Holden Heights. In 2016 we went viral and were featured on The Today Show, NBC Nightly News with Lester Holt, The Guardian, Vox, Vice, Upworthy, NowThis, and JamWa. We have grown thousands of pounds of food and reconnected over 15,000 people with the soil to advance the SDGs.

We are a program of IDEAS For Us and you can learn more at [www.ideasforus.org](http://www.ideasforus.org) and [www.fleetfarming.org](http://www.fleetfarming.org)

## SPACE AQUA - Smart Aquaponic System for Space, Arid and Circular Environments

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### **Abstract:**

#### Introduction

Climate change has threatened communities in many regions of the planet in places threatened by long periods of drought. It is strategic smart management of water and the efficiency of food production processes.

The research identified in Brazil the development of a social innovation in operation at the research station and simulation of Mars Habitat Marte in Caiçara do Rio dos Ventos / Brazil: an integrated system of circular food production having as technology the aquaponics.

It is considered that the operation of the Aquaponic food production system has a deep association with Goal 12 - Responsible Consumption and Production.

It was noticed that the Aquaponics System is a method of diverse ecological agriculture, without the use of the ground, able to generate vegetables and fish as final products. Compared with other cultivation methods, besides the practical, economic and socioenvironmental advantages, the aquaponics system uses 90% less water than the others. According to Woods (2019), this occurs because 95% of the water is reused working in a continuous closed loop system, passing through the plants that act as a filter. Considering this characteristic, the Aquaponics System is very strategic for places with limited water resources, which motivated the research.

#### Methodology

The methodology proposed in this research comprised the observation of some dimensions related to the SPACE AQUA - Smart Aquaponic System for Space, Arid and Circular Environments: 1) System characteristics; 2) relationship with SDG; 3) System management; 4) food production process and 5) replicability of social innovation.

#### Results

An important component of observation of the Aquaponics System was the characteristics considering: type of plants bed, volume of water in circulation, ergonomics physical space of the productive system, water flow and cost / investment. Below the findings regarding the aspects are commented below.

Plants bed type - The system in operation in Habitat Mars has six growbeds, which act as a biofilter and decanter, as well as a fish tank.

Volume of water in circulation: 1000 liters.

Ergonomics - The assembly of the growbed structure has been ergonomically designed, bringing greater comfort to those involved in the handling and production of food.

Physical space of the productive system - 3mx4m totaling 12m<sup>2</sup>.

Water flow - the design of the system took advantage of the effect of gravity in the water flow, avoiding losses and reducing energy consumption.

Cost / investment - Whenever possible, recycled resources were used, such as the benches where grow beds were installed. The total cost of installing the aquaponics system was \$ 1,000.00.

Relation with SDG - The aquaponic system can be understood as an educational space on social innovation, which can contribute to a quality education (Goal 4). Organic production can also be a factor in improving the health and well-being of the population (Goal 3) that will benefit from the replication of social innovation. The aquaponic system has collaboration to reduce hunger (Goal 2) and poverty (Goal 1). The system helps create awareness about Responsible Consumption and Production (Goal 12).

Management of the system - The management of the aquaponic system consists of monitoring whether the aquaponic system has provided the recirculation of the water while maintaining the balance of the resources involved. Therefore, fish-nourished water circulates through the production beds, where plants absorb the necessary nutrients and improve the quality of the water that returns to the fish tank. In the management of the system it is sought to observe the volumes of PH, ammonia and nitrites.

Food production - The operation of the aquaponic system allows the production of fish tilapia, beans, peas, papaya, corn, lettuce, basil, chives, tomatoes, blackberries, okra, and other kinds of food plants.

Replicability of social innovation - Note the possibility of the aquaponic system to be applied in other places that suffer from low water availability and need to use the water resource responsibly.

## Final considerations

It is noted that the aquaponic systems have a contribution to the functioning of off-grid spaces, habitats that need to maintain their own self-sustainability, providing better coexistence with arid or semi-arid ecosystems, degraded by the phenomenon of desertification and water scarcity.

## Funding IoT in Developing World Agriculture

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### **Abstract:**

Agriculture has long been recognised to be the gateway in to poverty reduction and hunger elimination (FAO, 2017). With forecast global populations of upwards of 9.8 billion causing the need for food production to increase by 70% by 2050 (FAO, 2017) it is clear that efficiency must be improved across the entire length of the agricultural value chain, from farming practice to transportation and sales. Considering the decreasing area of fertile soil globally, agriculture will essentially need to become drastically more efficient in order to produce more with less (Self, 2008). Technological development is expected to improve resource efficiency and by extension, increase product yield whilst reducing wastage and water consumption (Mind Commerce Staff, 2016). BIS Research (2018) detailed that integration of the Internet of Things (IoT) can lead to rapid implementation of precision agriculture. As shown by China, Japan and America, forms of precision agriculture such as real time irrigation modelling, variable rate input application, yield modelling and crop scouting have delivered net outcomes of improved yield at reduced expense (BIS Research, 2018). However, it has been established that small farms (i.e. those less than 2ha) make up the vast majority of the 570 million farms globally (Lowder, et al., 2016). Seventy percent of the world's food supply is said to come from these 570 million small farms, the majority of which are found in developing countries such as Nigeria, Kenya, Uganda and India (Fairtrade Foundation, 2013). Considering such global reliance upon the developing world's agricultural productivity, one can logically infer that the integration of the IoT in nations of Sub-Saharan Africa and Southern Asia is paramount for sustained food production.

Despite the indicated necessity for technological integration in the developing world's agriculture, logistical issues regarding infrastructure, program implementation and funding are yet to be critically reviewed (the latter of which may be viewed as prerequisite into the former two). A speculative avenue for such funding is that of a direct relationship between small farm holders and end beneficiaries (i.e. food retailers) which boasts potential for bridging the disparity between initial point of sale and final point of sale returns. Such a model is currently being implemented in localised regions by organisations, such as Business for Development, in order to improve the livelihood of some of the world's poorest farmers. Alternatively, an end beneficiary funded initiative, such as that demonstrated by the Better Cotton Initiative, could

potentially provide the necessary resources to provide both the mobile infrastructure, technology and education necessary to introduce such agricultural development. This paper will look to explore the feasibility these models both independently and comparatively.

## Good Practices in Sustainable Food Production

**Submitter: Saint-Louis, Joderson Prosper-Emmanuel**

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**Abstract:**

After more than four years of study, in 1987, a Commission published its results in a report entitled 'Our future to all', also known as the Brundtland report, by the name of Gro Brundtland, the Chairperson of the Committee. It is thanks to this report that a new concept of development has been introduced, namely sustainable development. The report defines sustainable development as: "a mode of development that meets the needs of the present without compromising the ability of future generations to respond to theirs". (World Commission on environment and development, Our future at all, Éditions du fleuve, 1989, p. 51)

Considering the environmental, economic and social abuses that all people on the planet are undergoing (specifically environmental ones). After following the annual International Conference on sustainable development (ICSD), real proposals and recommendations should be received in all sessions so that their applications are particularly useful in the session "good practices in sustainable food production".

Agriculture is the only way to be able to enter food production, which means sustainable food production will involve sustainable agriculture, which is the one that promotes long-term environmental quality and the basic resources that it depends on, while it satisfies the need of the human being. Agriculture is economically viable and improves the quality of life of farmers and society in General (American Society of Agronomy, 1989).

Taking into account the demographic explosion that grows at an exponential rate, there is a lot of mouth to feed and resources that are scarce, the fertility of the Earth decreases at an arithmetic rate is that one should walk in the logic of development Sustainable and what type of agriculture should be practiced?



Good practices in sustainable food production also involve production that respects ecological standards, healthy production, a good redistribution of productions in the system that we can talk about in agriculture that tends towards sustainable development.

Recurrent food crises, the alarming degradation of natural resources and the high rate of greenhouse gas emissions induced by agriculture have brought to light some fundamental issues relating to the modes of production in force in the world. Indeed, in the face of the resurgence of famine in many parts of the world, the question of whether the dominant agricultural methods are actually capable of food is constantly stirred.

In this context, family farming is more and more brandished as a relevant solution that can allow mankind to meet its food needs and sustainably preserve natural resources without which its survival would be Compromised.

"Family farming is a way to organize agriculture, forestry, fishing, aquaculture and pastoral production that is managed and operated by a family and especially dependent on the family workforce. The family and the farm are linked, co-evolve and combine economic, environmental, social and cultural functions. (FAO, 2013)

All sustainable and ecological agriculture assumes the use of organic materials/compounds in the case of fertilizer application to fertilize the soil.

In conclusion, good practices in sustainable food production are the practice of family farming, which has the following functions:

- Ensuring food security
- Create jobs and wealth
- Sustainably manage natural resources
- Conserve cultural heritage and peasant know-how

[Evaluating a coffee cooperative, COCAFAL \(Cooperativa Cafetalera Capucas Ltda.\): A value chain analysis in Las Capucas, Honduras.](#)

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**Abstract:**

Coffee consumers' growing awareness regarding transparency in global trade has added another dimension of commitment to accessing sustainably produced goods. A predominant focus on quality has expanded to include a demand for fairer labor practices and equity in the

value chain, resulting in powerful sectors of the coffee market to invest in value chain development. Multiple stakeholders now seek to promote value chain development as a means for implementing sustainable methods to reduce poverty and improve environmental and social performance. While high-level institutions embrace this approach, it is necessary to look closely at coffee communities to determine the degree to which existing capital and capacities are adequate to sustain growth and desired performance. This summer I will conduct a study to understand how a well-established coffee cooperative in western Honduras, COCAFAL, manages operations and maintains member and buyer satisfaction. I will conduct a pilot application of a financial analysis tool for forest-based products, the Green Value tool, which provides farmers and businesses with a simplified design of the financial costs of their operations, and the opportunity to determine where costs can be minimized. Through the implementation of the Green Value tool, appreciative inquiry, shareholder input, unstructured and semi-structured interviews with cooperative members involved in various parts of coffee production, processing, and administration, I will analyze the cooperative from a value chain perspective, with a focus on effectiveness and efficiency. Preliminary results will include recommendations for allocation of financial resources within the cooperative, an updated marketing strategy for COCAFAL, and a strategic business plan based on quantitative and qualitative data for a private company (Umami Area Honduras) that endeavors to support the cooperative. These deliverables along with the value chain analysis, will provide a platform for developing direct buyer relationships, encourage the adoption of a serviceable instrument for the cooperative to apply and adapt over time, create an economic and sustainable demonstration model for coffee cultivation and processing, and over time improve livelihoods across the value chain. Due to the impact the cooperative has on the community and its nearly 1000 members in surrounding areas, namely in poverty-rich communities of western Honduras, this research with COCAFAL aims to approach SDG's 1, 2, 3, 5, and 12 by providing work opportunities and financial sustainability, increasing opportunities for technical assistance and outreach for community members through the reallocation of profits, and creating a more sustainable agricultural business through more transparent relationships across the value chain.

## Food Insecurity among College Students in Africa: A Case of the College of Business Education in Tanzania

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### **Abstract:**

The prevalence of food insecurity among college students has received little attention in academic literature, despite previous studies suggesting increased risk and potentially high rates of food insecurity among students. This study assessed the prevalence of food access insecurity among the college students, and explored its relationship with socio-demographic characteristics. A cross-section study design was used and data were collected from a sample of 287 undergraduate students at the College of Business Education, Dar es Salaam Campus,

Tanzania in June 2016. Data were collected using a standard questionnaire which included the three domains from the Household Food Insecurity Access Scale (HFIAS). Descriptive analysis was conducted using Statistical Package for Social Sciences (SPSS) version 20. Using the HFIAS tool, prevalence of food insecurity among the surveyed students was 43.2%. Overall, more than a half (57%) of all food insecure students were males. Year three students were relatively better compared to their counterparts of year one and year two, and students residing either on-campus or with parents were more food secure than those staying off campus alone or with a friend. Also, students who sourced most of their income from salaried jobs were more food secure than students depending on a lover or Higher Education Students' Loans Board. To conclude, food access insecurity is a significant problem among students in this college. Future studies need to investigate the impact of food insecurity on college students' academic performance and strategies these students use to cope with their food insecurity. In addition, an assessment of food insecurity and its determinants among college students across the country would enable policy makers to assess the magnitude of the problem and formulate strategies to reduce the problem and its consequences.

### Evaluation of weed management ability of akidi cowpea (*vigna unguiculata* cv it84d-666 (l.) Walp) in maize cropping system in Ibadan, Nigeria

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#### **Abstract:**

Weed interference is a major constraint to maize cultivation, and the use of herbicide in weed control could be detrimental to the environment. Fallow served as a suitable means of managing weed in the past, but it no longer obtainable due to population increase. In a bid to enhance food production, there is need for an eco – friendly approach that is void of the detrimental effect on the ecosystem. However, the interplanting of leguminous cover crops with maize could be a suitable approach toward obtaining a suitable food production.

Field experiments were conducted to investigate the effects of five weed control methods on maize. Maize interplanted with Akidi Cowpea (AC) at 20,000 (M1), 30,000 (M2), 40,000 (M3) plants/hectare, hoe weeding (M4) at 2 weeks and Primextra 2.5 L/ha (M5) applied after sowing maize to evaluate weed suppressing ability of the treatments and maize weedy – served as control. The treatments were laid in Randomized Complete Block Design (RCBD). Weed Control Efficiency–WCE (%), Shoot Dry Weight–SDW (g), Grain Yield–GY (t/ha-1), weeds species were identified and Relative Importance Value (RIV) were determined using standard procedures. Data were subjected to descriptive statistics and ANOVA at  $\alpha 0.05$

Results at 8 WAS of maize showed that WCE was highest for M3 (94.75%) and lowest for M5 (66.38%). However, akidi cowpea acted as living mulch, reducing the weed biomass significantly. Maize SDW was highest for M3 ( $84.88 \pm 0.67$ ) and maize GY was highest for M5 (2.87) and lowest for control (0.70), but among akidi interplant the highest GY was obtained at M3 (2.35). *Ageratum conyzoides*, *Bracharia deflexa*, *Boerhavia diffusa*, *Desmodium scorpiurus*, *Euphorbia heterophylla*, *Euphorbia hirta*, *Indigofera hirsuta*, *Ipomoea repens*, *Phyllanthus amarus*, *Talinum fruticosum*, *Tridax procumbens*, *Mitracarpus villosus*, *Sesbania pachycarpa* and *Amaranthus cruentus* were found in associated with Akidi Cowpea and maize.

Maize and akidi interplant density of 40,000 plants per hectare had the best weed control efficiency and shoot dry weight. The dominant herbaceous plant families were the Fabaceae, Poaceae and Asteraceae, with the Fabaceae family having the highest species number.

Keywords: Food production, Cover crop, Interplant, Weed control

## Investigating the Relationship Between Monetary Policy and Maize Price Volatility in Malawi: A Vector Error Correction Model (VECM) Approach

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### **Abstract:**

Volatility in the price of maize has been a concern among policy makers for a long time in Malawi given its nature as a staple crop for most households. In this study, we look at how this phenomenon is related to some key monetary policy factors, especially the Malawi exchange rate and the interest rate, using a Vector Error Correction Model (VECM) with monthly data from 2000 to 2016. Other explanatory variables considered in the VECM include the Gross Domestic product (GDP) deflator, food production index, broad money supply, central bank balance sheet (measured as Reserve Bank of Malawi (RBM) Balance Sheet, as well as the ninety one (91)-day treasury bill yield. The log of maize process over the period under consideration forms our dependent or explained variable in the model. Various statistical tests are conducted on the data to ensure its suitability for analysis. They include unit root tests for stationarity of the variables, as well as tests for the optimal lag length and cointegration of variables. Granger causality tests are also conducted to establish relationships amongst the variables. Impulse

response functions are also generated through this study, to determine the impact of changes in variable over the other key variables. Results indicate the existence of a long-run relationship between the price of maize and all the independent variables. Also, both the immediate past price of maize and its lagged price are found to have a statistically significant impact on the existing maize price, *ceteris paribus*. This shows that the demand for maize is elastic, with respect to its respective prices in the immediate past two months. However, we also find that the results indicate a statistically insignificant relationship between the price of maize and the key monetary policy variables, suggesting that there could be other factors responsible for the volatility. This indicates that their shocks hardly affect the price of maize in Malawi. We therefore recommend that the government takes into consideration the immediate past two months' prices for maize when making regulatory decisions regarding maize prices in the country.

Key Words: Cointegration, Exchange Rate, Interest Rate, Maize Price, Malawi, Monetary Policy, Vector Error Correction Model.

## Good Practices in the Energy Sector: Modeling and Simulation, Case-Studies, and Capacity Building

### Improved system in urban energy through distributed generation: Methods and models

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#### **Abstract:**

The path towards energy sustainability is commonly referred to the incremental adoption of available technologies, practices and policies that may help to decrease the environmental impact of energy sector, while providing an adequate standard of energy services. The evaluation of trade-offs among technologies, practices and policies for the mitigation of environmental problems related to energy resources depletion requires a deep knowledge of the local and global effects of the proposed solutions. While attempting to calculate such effects for a large complex system like a city, an advanced multidisciplinary approach is needed to overcome difficulties in modelling correctly real phenomena while maintaining computational transparency, reliability, interoperability and efficiency across different levels of analysis. Further, a methodology that rationally integrates different computational models and techniques is necessary to enable collaborative research in the field of optimization of energy efficiency strategies and integration of renewable energy systems in urban areas. For these reasons, a selection of currently available models for distributed generation planning and design is presented and analysed in the perspective of gathering their capabilities in an

optimization framework to support a paradigm shift in urban energy systems. This framework embodies the main concepts of a local energy management system and adopts a multicriteria perspective to determine optimal solutions for providing energy services through distributed generation.

## Hydroelectric Dam Construction and Heritage Resources Monitoring: A Case Study of the Keeyask Generating Station in Manitoba, Canada.

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### **Abstract:**

The study aims to identify resilient strategies to monitor and protect heritage resources in the Keeyask project site so as to encourage Indigenous culture revitalization and preservation. Keeyask Generating Station is a 695-megawatt hydroelectric generating station being built on the lower Nelson river in Manitoba, Canada through partnership between Manitoba Hydro and four Manitoba First Nations: Tataskweyak Cree Nation (TCN), War Lake First Nation (WLFN), York Factory First Nation (YFFN), and Fox Lake Cree Nation (FLCN) (Manitoba Hydro, 2019).

The direct and indirect changes caused to heritage resources by the project activities alongside unpredictability of potential disturbances in such a complex socio-ecological environment exposed to a huge hydroelectric development project managed by a complex governance system has created an opportunity to take a resilience thinking approach. The area has a history of over 6000 years of human occupation (Manitoba Hydro, 2019) and hence is bestowed with abundant heritage resources. However, as determined by the Environmental Impact Statement (EIS) of the Keeyask project, there can be adverse impacts on these resources, both known and unknown, including loss of heritage due to flooding, shoreline erosion, peat disintegration, pedestrian and vehicular traffic, construction, clearing, excavation, disposal of excavated materials, drilling, and access roads construction (KHLP, 2012).

Given these potential damages to Indigenous heritage and the likelihood of ongoing impacts well beyond the area of the project site, it deemed so important to look at how monitoring activities are being conducted. To achieve this objective, the researcher has assessed the heritage impact section of the EIS, the Heritage Resource Protection Plan (HRPP), annual heritage monitoring reports, and conducted review of other relevant documents and literature in the area. The review intended to look at strategies the project impact assessment and protection plan has put in place regarding heritage resources protection as it relates to how heritage monitoring and follow-up has been conducted so far.

The Keeyask EIS, overall, does a good job identifying heritage resources in the area in consultation with Indigenous knowledge keepers. However, the project gave very little emphasis on heritage monitoring and follow-up activities. The monitoring reports produced every year are not comprehensive enough to show the status of heritage resource protection in

the area and the program fails to thoroughly monitor how the loss and relocation of heritage resources have been impacting the communities' social/cultural well-being. The focus appears to have mainly been on the excavation of artefacts. However, heritage protection and monitoring are not one-time tasks, but continuous, and they should involve identifying risks affecting the heritages discovered, recognizing local knowledge, engaging and recognizing the needs of the community, and capacity building to strengthen management and protection of heritage resources.

## [A free online tool to assess sugarcane straw electricity production in Brazil](#)

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**Abstract:**

Affordable and clean energy is the seventh of the 17 United Nation's Sustainable Development Goals. In Brazil, the sugarcane industry has notably contributed to achieve a more sustainable economy since the late 1970's when ethanol was gradually introduced in the energy matrix as a governmental initiative to deal with the effects of the oil crisis. Electricity, which is an important co-product of both the ethanol and sugar industries, also evolved in terms of both generation and embedded technology in mills over the last four decades. Currently, 7% of the total Brazilian electricity is already generated by the sugarcane sector. Although this scenario is



relatively positive when compared to other countries in the world, there is a clear opportunity of expanding bioelectricity production even more. Recent changes in environmental legislation are progressively prohibiting sugarcane burning before harvesting in Brazilian Center-South region; consequently, a huge amount of straw (i.e., sugarcane tops, dry and green leaves) has become available in most of the sugarcane fields. Moreover, bioelectricity avoids the need of meeting the additional electricity demand with fossil alternatives such as thermoelectricity from natural gas. Bearing this context in mind, this work focuses on the development of a free simulation tool by the Brazilian Bioethanol Science and Technology Laboratory (CTBE/CNPq) that will support decision-making processes involving sugarcane straw recovery projects aiming to produce electricity in Brazil. Considering the lack of public and reliable information available to professionals from sugarcane sector, government, academia and other stakeholders about the economic and environmental impacts of sugarcane straw use to produce electricity, this online calculator is meant to be an instrument to diffuse knowledge on this topic. In this paper, we demonstrate how surrogate models representing an integrated sugarcane production chain (agricultural and industrial processes) can be built and applied in specific case studies to generate comprehensive outputs to the online users, such as: area suitability for straw recovery, required investments, straw costs, yearly electricity generation, electricity minimum selling price, avoided greenhouse gas emissions, among others. In addition, case studies will be presented to demonstrate the potential results. This online tool is a legacy from the Sugarcane Renewable Project (SUCRE), funded by the Global Environment Facility (GEF) and managed in a partnership with the United Nations Development Programme (UNDP).

## SDG 7: Can and Will Mathematics Help?

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**Abstract:**

A lot has been said at different times about how disastrous the effects of non-renewable energy resources have been on the globe. The processing of fossil fuels emits harmful greenhouse gases into the air. These gases, primarily carbon dioxide, damage the ozone layer which protects us from the sun's radiation. Other types of dangerous effects are acid rain (which is created by the emissions of Sulphur and other chemicals into the atmosphere), land pollution and oil spills which both damage nearby shores and ecosystem. It is also clearly understandable that the cost of managing non-renewable energy resources is very unbearable, and its sustainability absolutely uncertain. Hence the need to look out for the most effective and efficient alternative. However, energy is an important enabler for the other SDGs; if other SDGs must be realized, SDG 7 must be given a really considerable attention. Can we by 2030



have a more affordable, reliable, sustainable and modern energy for all than we have now with the help of Mathematics? Certainly yes! Since the world is paying more attention to the use of renewable energy resources to have a cleaner and more affordable energy, and many researchers are working on how these resources can be maximized, thereby gradually mitigating the effects of non-renewable energy resources, the role of Mathematics cannot be overemphasized. Due to the high level of financial facilitation and management in the modern energy market, market players have been exposed to complex decisions that concern both the improvements of industrial processes and the maximization of economic results. The invoking of optimization in many different sectors of the typical value chain that characterize energy companies becomes more important than ever before, starting from investment and strategic decisions to industrial operations related to energy assets and, finally, to hedging and trading decisions to be taken onto competitive markets. Optimization problems which are totally different request for extremely different optimization techniques for their formal solution. Mathematical methodologies are frequently used in order to correctly and accurately solve different optimization problems that modern energy markets have. Nonetheless, to get the correct solution to a problem, one has to, first of all, correctly frame the optimization problem itself. This is the correct and rigorous translation of the business optimization issue into a formal mathematical problem. Once this is done, mathematical methods in making optimal decisions may be employed, and consequently proffering effective solutions to specific problems. Since Mathematics is the bedrock of science, its usefulness in realizing SGD 7, which in turn would enable the realization of the other goals, cannot be overemphasized.

### Good practices for the methodology in the design and sizing of microgrids in rural areas

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#### **Abstract:**

The present work proposes to tell the good practices that arise from field experiences in projects developed in the last years. The objective is to develop a methodology for the selection and sizing of rural microgrids in small communities, improving the traditional solution of the generator group with the incorporation of renewable energies with open software and hardware technologies developed by the group together with NGOs. As a case study, the rural school of Santa Bárbara is proposed in the Puertas del Sol area in the department of San Martín of the Province of San Luis, Argentina.

### Participatory Energy Policy-Making: A Case Study of the Taiwan Energy Transition Whitepaper Public Participation Procedure

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**Abstract:**

Taiwan Energy Transition Whitepaper is a National program of participatory governance aiming for clean energy transition in Taiwan from 2017 to 2019. In this article, we introduce the planning and process of the Taiwan Energy Transition Whitepaper. The goal is to understand the mechanisms of stakeholder and public participation. We report three discoveries. First, at the level of social communication, different stakeholders acquire or amplify their voices and strengthen their civil capacities through public participation. Second, with regards to influence on policy-making, public and private sectors develop two new major action plans and revise eighteen pre-existing governmental plans in a collaborative manner. Finally, at the governance level, we observed that expanded public participation positively intervenes in the existing administration.

## Carbon Footprint Reduction through Co2/Pm Emissions Control of Diesel Generators for the University of Nigeria through an Integrated Renewable Solution

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**Abstract:**

The production and use of fuels for diesel generators result in emissions of Green House Gases (GHGs) besides carbon dioxide which includes methane and nitrous oxide. Climate change effect on the human population and the environment as a result of GHG emissions has created an

unsafe environment. In view of the importance of these generators as an emitter of GHGs, namely CO<sub>2</sub>, with the growing concern about climate change, this paper aims to explore the emission of CO<sub>2</sub> from these generators for the purpose of reducing the emission rate. The power demand in the university is about 3MW which ultimately cannot be met by the National Grid supply thereby necessitating an alternative arrangement which is mostly from Diesel Generator hence contributing to increase in GHGs and consequently global warming. Therefore, a controlled measure in reducing carbon footprint is advocated for through an integrated green power solution taken the University of Nigeria Nsukka as a case study. The study is aimed at proposing a modeled integrated energy source replacement strategy with a green solution in minimizing CO<sub>2</sub> emission and concurrently carbon footprint reduction. The simulation of the emission rates of these generators which varies with duration of use, load demand, and plant operational characteristics is a key guide to the formulation proposed an integrated solution. In every infrastructural replacement program of which energy being a capital intensive project, the cost has a key role to play in achieving a sustainable replacement strategic model, and this concept is one of the based-model driving the proposed integrated energy source replacement strategy. There are different forms of renewal power solution, however, our study is based on the photovoltaic (PV) cell. They are environmentally friendly as they do not produce any GHGs which cause global warming. The average production cost has over the decade drop shapely; couple with a great improvement in the energy conversion efficiency with so much funded research work towards doubling that in few years ahead. With this solution, we can adapt the system capacity up to the desired level due to their modularity and expandability.

## Self-sustaining Eco-friendly Gyms

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### **Abstract:**

In a world with increasing global warming negatively impacting the environment and humanity, it becomes imperative to develop new initiatives that address this global challenge. Working with this concept, a new sustainability innovation has been developed of self-sufficient gyms. The idea behind this is that gyms use energy harnessing equipment to convert kinetic energy into electricity which can be used to power the gym.

This innovation addresses the damaging effects of burning fossil fuels. Copious amounts of CO<sub>2</sub> are released into the air, augmenting the greenhouse effect and leading to global warming and numerous other environmental issues. With 80% of worldwide energy being provided by fossil fuels (Global CCS Institute, 2019), it is evident that a major change in societal attitudes and values is needed to move away from these destructive practices. The use of renewable energy, produced by harnessing human energy, eliminates fossil fuel consumption and hence, reduces our carbon footprint. Additionally, the adoption of renewable energy promotes sustainability and encourages the community to improve their health and fitness. While increasing awareness of the environment and sustainable practises, it also increases the overall prosperity of the

community by connecting humans with the environment and causing positive residual effects outside of the gym.

Exploring the case study of Eco Gym, a self-sustaining gym in Rochester, New York, the scalability and achievability is discovered. 21 cardio machines are used to generate energy through micro-inverter technology (Love, 2018). On average, a person can generate 50-100 Watts of power by pedalling on one of these bikes, powering 4 light bulbs for an hour (Morgan, 2018). This gym, however, does not harness enough energy to fully power its infrastructure as not enough energy is created. Added rooftop solar PV and small wind turbines are required to provide a Net-Zero energy environment.

However, the business opportunity here, is significant as members are directly contributing to the running of the gym with zero carbon emissions. Implementing these environmentally conscious gyms into society will create a social norm around sustainability and health which individuals are willing to invest in. It then becomes a cost-effective strategy that embodies the future of eco-friendly fitness centres and community wellbeing.

Addressing the Sustainability Development Goals of Health and wellbeing, Affordable and clean energy, Industry, innovation and infrastructure and specifically Climate action, this initiative has the potential to dramatically shape the future of clean energy and sustainability. Individuals can palpably see the contribution they are making to environmental sustainability, while also increasing their overall fitness and wellbeing. The strong correlation between the health of the community and the environment makes this a very influential scheme to create a lasting, positive impact and tackle climate change. This, consequently, will pave the way for future advancement in human-powered initiatives, connecting humans with the environment and improving overall development.

## Community Acceptability of Renewable Energy in Africa: Implications for Climate Change Action in Sekoukou, Niger

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### **Abstract:**

Inadequate electricity access in Africa has socio-economically stifled the continent thereby leading to increased health risks and excessive burdens on the forest for fuelwood alongside other environmentally destructive practices [REF]. This has heightened international concerns, triggered investment, programmes and policies aimed at alleviating Africa from her staggering energy penury. However, efforts at promoting energy access through renewable sources face serious impediments due to implementation approaches that deviate from community concerns and acceptability towards mainly economic viability and technology affordability.

This study, therefore, aims at ascertaining how community acceptability of renewable energy can impact climate action at the local level towards attaining the triple impact of clean energy, climate adaptation and sustainable development.

A concurrent research method approach to soliciting first-hand information from Sekoukou community in Niamey-Niger will be adopted for this study. Data will be gathered through focus group discussion, field survey, interview and observation, with the aid of a participatory model for vivid analysis of data on gender

The outcome will show the possibility of mitigating climate change through the use of renewable energy in communities without unfriendly concerns. Further findings will serve as guidelines to assist policymakers in developing community based renewable energy project with integrated gender concerns. Moreover, it will raise awareness on achieving the sustainable development goals in Niger through improved energy access, while providing further, some viable recommendation to ameliorate the socio-economic, environmental and renewable energy challenges in the Niger Republic.

Keyword: Acceptability, Solar Energy, Clean Cooking, Climate change, Rural communities

## Innovative Conversion of Cassava Wastes into Energy

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**Abstract:**

Cassava, *Manihot esculentus*, is the major source of carbohydrate in the West African countries including Nigeria. The processing is mostly done by women and youths and the processing relies presently on firewood for the frying of the pulp into garri, the grain meal that is a favorite meal in Nigeria. The sewage from the pressing of the milled pulp is both acidic and toxic and source of water pollution and emission of CO<sub>2</sub> and other gases, while the cassava peels also degrade and release methane and CO<sub>2</sub> and other greenhouse gases into the atmosphere. The use of alkaline extract from woodash to neutralize the sewage from cassava processing has been identified as a symbiotic means to neutralize the acidic sewage waste productively to increase the biogas yield from the cassava sewage and innovative use of hitherto industrial waste from sawmills wastes.

The design of appropriate biogas digesters for the conversion of the wastes to energy is crucial to making the technology adaptable in Nigeria. The digester designed for this purpose has the

facility to first neutralize the acidic wastewater in an equalization tank before releasing into the digester. Earlier study without pre-treatment of the cassava waste gave a biogas yield of 267 L/m<sup>3</sup>-day. With the neutralization of the wastewater, the yield is expected to double. A biogas digester design with the facility to reduce the excess water that limits biogas yield and integrated with toilet facility will be presented. The biogas generated will be used in frying the garri grains instead of firewood. The facility will ensure cleaner production, reduction of emissions and production of a higher quality of food in the cottage factories.

## Resource-Sharing, Innovative Finance and the Sustainable Development Goals: Paths for Inclusive and Innovative Community Economic Development (CED) Agreements for Hydro-Affected Aboriginal Communities in Manitoba, Canada

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### **Abstract:**

This communication will draw on quantitative economic tools to develop financial models based on a variety of possible income streams that could be deployed using Canada-based Electric Utility Company Manitoba Hydro's economic resources, including resource sharing, so-called 'river rentals', and subsidized electrical rates. The Canadian province of Manitoba is home to more than two hundred thousand people who identify themselves as First Nations, Métis or Inuit. This population account for some 18% of the local demographic pool, making Manitoba the province with the biggest Aboriginal share amongst all. From the 130,000 thousand registered First Nations inhabitants, some 60% live at one of the 63 recognized reserves. Despite ominously present in official documents and discourse, 'Reconciliation' is a concept still distant from the concrete reality of many of these communities. Absence of drinking water sources or proper housing are two among several societal challenges these localities still face. While the socioeconomic gap between Aboriginal and Non-Aboriginal peoples is, by no means, a locally circumscribed phenomenon, the Manitoba situation seems to be particularly critical. Data from 2011 indicate that no less than 39 of these reserves (thus 61.9% of them) scored 49 or less (out of 100 points) in the Community Well Being Index (CWB). Such figures puts Manitoba in the last place amongst all provinces when it comes to securing adequate and dignified living conditions for its Aboriginal populations. One of the reasons for this recurrent pattern – so will we argue – derives from the reluctance of provincial authorities (there including its main crown corporation, Manitoba Hydro, owner of 15 hydroelectric generating stations across the whole province and the pivotal economic actor within the provincial North) to review and actualize financial agreements with local communities. This communication is inscribed within an enlarged advocacy exercise being developed as a partnership between the University of Manitoba-based Alliance of Hydro-Impacted Communities (Wa Nis Ka Tan) and Aboriginal communities. Its pragmatic objective it to offer

technical and financial support through the production of reports assessing the viability of regulatory alternatives for communities affected by the operations of Manitoba Hydro. Our main ambition is not only to empower local leaders and decision-makers in their negotiations: by studying innovative, inclusive and financially sustainable resource-sharing models throughout the world, we aim to effectively transform the provincial regulatory framework. Informed by the principles of Community Economic Development (CED), we believe that Manitoba can reinvent its developmental strategy and its relationship with Aboriginal Peoples, eventually leading the way when it comes to securing the Canadian ambitions to cope, by 2030, with all the 17 Sustainable Development Goals (SDGs). Achieving equitable, innovative and sustainable agreements with traditional inhabitants of certain geographical areas means not only coping with the deleterious effects of colonial practices of the past: it means sharing with justice the economic benefits of shared resources (in this case, water basins). It also means envisioning a culturally and economically inclusive future, where not even one single person or group of persons is left behind.

## An intuitive Sizing method of a stand-alone photovoltaic power system for a village in the Baol zone, Senegal

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### **Abstract:**

This work aims at sizing a solar photovoltaic plant to ensure the electricity supply of the village of Ndem. All the electrical loads are already connected to the national electricity society's network.

Study showed that the month of december records the lowest total daily and monthly irradiations and the sunniest months are: March, April, May and June. The hottest months are July, August, September and October.

The charge evaluation shown that the daily energy consumption of the village of NDEM is 441181Wh and the daily power is 50514W.



Using the intuitive sizing method and considering that panels will be oriented towards the North-South and inclined by 14 °47'53, we found that the peak power is 115236Wc and the solar power plant has as components : 524 polycrystalline panels, 1128 lead-acid batteries (2 V / 735 Ah), a Sunny Boy inverter for the AC loads and a Sunny Island which transforms the DC current of the batteries. We also found 4421meters for the total length of cables and shown that a Sunny web box can monitor the operation of solar panel power plant remotely via an Internet connection.

We also calculated the total investment cost of the solar plant power which approximately is FCFA 349878353. A return on investment is expected for 18 years and 10 months. A comparative study showed the advantage of the use of solar power plant in relation to the invoice national electricity society.

## Challenges in Integrating Iso 50 001 Energy Management System into the Organisations in Sri Lanka

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### **Abstract:**

Over the last few years, Build environment is identified as one of the most energy consuming sector in Sri Lanka. For example from 2010 to 2014 the total energy consumption for industrial sector increased by 16.23% while commercial sector, electricity demand increased by 25.49%. As a result of that, energy efficiency has become a central topic and there are different standards and energy saving practices integrated to optimize the energy consumption of building. However, in Sri Lanka ISO 50001:2011 energy management system (EnMs) is gaining recognition since it is the only certification that could be obtained in terms of the energy efficiency. This provides many benefits such as; enhance the internal and external recognition and rewards, optimize energy cost, reduce environment impact, and secure energy supply, etc. However, it is identified that a less number of ISO 50001:2011-EnMS certified buildings currently exist in Sri Lanka thereby, there is a great need to promote the implementation and maintenance of ISO 50001:2011. Therefore, this paper aims to identify the challenges in maintaining the ISO 50001 EnMs in Sri Lankan organisations.

A comprehensive literature review, preliminary expert survey and a questionnaire survey were adopted as the research methods. Data analysis of the expert survey was done through content analysis while questionnaire survey was analysed using Mean Weighted.. As the findings



revealed, difficulties in budget allocation, need for managing large amount of documents, development of energy plans for new installations and non-availability of competent personnel internally are the most significant challenges faced by the business organisations in Sri Lanka during the operational stage of ISO 50001 EnMS. The study further identified that hiring external energy consultant, conducting awareness and training programmes for employees and allocating responsibilities among entire staff as the possible solutions to overcome the identified challenges. Determining an organisation's own challenges in this context should be done by considering the organisation's own resources, capabilities and the organisational culture. Organisations will be able to have a smooth operation and enjoy numerous benefits that the ISO 50001 standard is capable of providing, if they are properly equipped with the above solutions.

Keywords: ISO 50001:2011 Energy Management System (EnMs), maintenance, challenges

## Energy efficiency and Non Energy Benefits as an additional driver for implementation of SD in Higher Education institutions.

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**Abstract:**

Higher education institutions (HEI), have been growing their visibility as a key player in the promotion of Sustainable

Development (SD). Often they try to make advancements in SD implementation at several domains at the same, consequently the global rate of success can be rather low. I present the results of Energy Efficiency (EE) and Non Energy Benefits (NEB) as an additional driver for the implementation of SD in two HEI. Method The Global Reporting Initiative (GRI) is often used in industrial concerns but also in HEI. Energy Quick Scans (EQS) investigate the employability of available techniques in order to reduce the energy consumption and emission of greenhouse gases (GHG) and to increase (own) energy production and flexibility. Energy Performance Contracting (EPC) benefits the building owners and users by reducing risks they would otherwise incur if they did it themselves. Results and Discussion HEI are often performing efforts at the same e.g. in terms of campus greening, curriculum renewal and research orientations. Karatina University has been implementing several measures in terms of a sustainable campus. All these activities have been assessed through different indicators. This institution transposed the application of the GRI indicators to the context of HEI. The University started recently with several in- and extern stakeholders a postgraduate Energy Efficiency Services (EES). As a result of this curriculum renewal the University performs EQS for all their buildings. They will eventually decide to opt for an

EPC. I will discuss the interchangeability of the good practices of both set-ups. Conclusion EE (in collaboration with in- and external stakeholders) in combination with GRI reporting (mainly with internal stakeholders) gives additional opportunities and accelerate the introduction of SD in HEI thanks to the NEB

## From Fossil Fuels to Renewable Energy: Non-Standard Challenges and Solutions to Accomplish in Transformation of Russian Power Industry

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### **Abstract:**

Russian Federation is the only country in the world that has such extensive territories. Therefore, national electrification has always been a challenge, which required large amounts of investments, labor and time. As a result, a centralized power grid was created. It can be considered a genuine masterpiece as the electrical transmission network stretches for 2,35 millions of kilometers and the total installed capacity of all power plants is 243 234,20 MW. However, about 60% of the area is not grid-connected, which means that almost 20 million people still remain without a steady and affordable power source. They have to find other ways of energy supply, mainly diesel generators. In such regions, electricity cannot be accessible a priori, which is inconsistent with the intent of the 7th UN sustainable development goal.

Russia is one of the few countries in the world that has such substantial mineral reserves which caused the widespread of both coal and natural-gas fired power units. Nonetheless, the environmental friendliness of these technologies still continues to be a major challenge. The power supply problem may be solved in the short-term. but in the long-term, there is a clear need for the redrawing of the established energy-generating approaches towards cleaner production of the energy. This is about the ecological future not only in Russia but the entire planet.

The main goal of this paper is to analyze the possibilities for the development and building up capacity for achieving SDG#7 in Russia. The main obstacle to transformation is the phase-out of fossil fuels and divesting from them. That is why the study anticipates the implementation of the sustainable development goal not only from a technological standpoint, but also takes into account the practical applicability and emphasizes the importance of educational focus.

The analysis is based on the relevant energy technologies presented in project Drawdown by Paul Hawken. These solutions will be in line with the new course for the digitalization and development of intelligent power generation in Russia. The research involves collaboration with energy companies that are currently working on the transition to an alternative source of energy and have real experience of “green” technology deployment. Educational projects are

also crucial for reforming any sphere in Russia because the citizens must be ready to be part of the change. The projects “Open School of Sustainable Development” and “Renewable Russia” are directly related to raising awareness on goals of sustainable development and on the importance of increasing energy efficiency. Finally, necessary recommendations will be made on methods to accelerate the transition to renewable energy and to implement the new business models in the Russian power industry.

## The Green Equalizer: Promoting Economic Security for Struggling American Households through Energy Efficiency and Environmental Sustainability

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### **Abstract:**

While we are in the tenth year of what has been a historically long recovery, many American households throughout the country have yet to feel the effects of this economic boom. Instead, wages have been stagnant while the cost of living has increased. During this same period the world has experienced seven of the top ten hottest years on record, making it harder to ignore the new realities of a warming planet. Though climate change is having an increasingly detrimental effect on families throughout the world, some U.S. policy makers are still rejecting policies that promote environmental sustainability under the assumption that they are “job killers” which hurt working and middle class families. Studies are increasingly showing, however, that this is not in fact the case. Instead, research has found that environmental policies have the ability to both reduce our carbon footprint while providing clear economic benefits to society. In the United States investment in energy efficiency have the potential to aid struggling American families by reducing their household expenses, decreasing healthcare costs, and increasing the value of their homes. For my analysis I have utilized the dataset “Residential Existing Homes (One to Four Units) Energy Efficiency Projects with Income-Based Incentives by Customer Type: Beginning 2010”, which I obtained from Open Data NY. I will specifically examine the degree in which investments in home efficiency projects result in reductions in utility costs, energy use, and greenhouse gas emissions. My preliminary results suggest that such investments have both financial and environmental benefits for New York residents and the planet as a whole. It is my hope that findings such as these will, in time, put to rest the myth that environmental sustainability and economic security are incompatible goals.

## Feasibility Analysis of Micro-Hydropower Installation in Water Supply Pipes of a New Jersey Water Supply Company

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### **Abstract:**

Recent developments in hydropower technology have allowed for the generation of electricity without causing harm to the environment or depleting non-renewable, natural resources. Such technology involves the installation of a micro-hydropower system in a water supply pipeline. To analyze the success of such developments and to understand their feasibility, a case approach to implementing a micro-hydropower turbine in the pipes of a water supply company was completed. Multiple case studies were analyzed to understand the costs and benefits associated with the installation of a micro-hydropower system. The information gathered from these case studies were compiled and applied to a New Jersey water supply company to understand the feasibility of the renewable energy source. By performing a cost-benefit analysis and return on investment, the results found the project to be feasible with significant benefits accruing over time. Whether the company decides to use or sell the produced energy, both options found the payback period to be as little as 5.6 years and further validates the project's feasibility. The implications and steps to install the system were also conducted to serve as a reference and starting point if the water company chose to follow through with the project. Completing this project would be beneficial to both the company and the environment, where substantial profits would be obtained through the creation of clean energy while avoiding air pollution and environmental degradation. Moreover, the micro-hydropower turbine would help support the water company's efforts in becoming a more sustainable business, where they would be reducing their carbon footprint and standing as a leader in the sustainability movement.

## Energy efficiency indicators of road freight transportation sub-sector for the development of an integrated transport policy.

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### **Abstract:**

Worldwide, the use of trucks and buses represents approximately one third of the global transport energy use and about 40% of the total fuel consumption on the roads. Regarding freight transport, the activity levels intensification and changes from rail transport to road transport increased energy consumption by 65% between 2000 and 2017. In Mexico, during 2017 the average energy intensity of diesel vehicles was 140.8 barrels/vehicle, 16 times more than gasoline vehicles. Given that a large part of diesel trucks are used in the logistics sector of materials transportation with an average fuel consumption 2 times higher per ton-km than countries with greater share of road freight transportation in total merchandise traffic, it is necessary to estimate the indicators of energy efficiency in the sub-sector for the development

of new integrated transport policies that allow, subsequently, to monitor their effectiveness. This proposal uses, initially, the approach of using administrative data for the information collection according with methodological proposal of the International Energy Agency focused on two types of indicators, ratios and absolute values. Starting from the statistical principle of collect only necessary data, breakdown of final energy consumption by sector extracted from the energy balance of a country, is the first step to follow. Then applying the principle of the more detailed the data available, the better, disaggregated data at sub-sectoral level must be necessary. Finally, data on energy consumption and activity levels are identified, collected and analyzed. Until now, the results show that 72% of the load is displaced in three-axle vehicles, that the fuel yield per tkm has remained almost constant since 2000 and that by 2030 it is estimated a 55% increase in the diesel demand given the increase in the diesel-intensive vehicle fleet and in the same year, the transport sector must reduce its GHG emissions by more than 20%. In a second phase of this research proposal, it is intended to use, in combination, the survey methodology to validate and support data collection and thus create more robust sets of indicators.

## Unlocking \$1 billion for Renewable Energy: a private sector case study on de-risking investments for emerging economies

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### **Abstract:**

As of 2016, 1.1 billion of the world's population is without electricity, and only 8.4% of the world's electricity generation is renewable. By 2030, 60% of the world's population will be living in cities, requiring a tremendous amount of additional energy. With climate change presenting the biggest threat to development, the additional energy needed for an increasingly urbanized population must be provided primarily as renewable energy. Access to renewable energy will also help mitigate climate change's unprecedented impacts disproportionately burdening the poorest and most vulnerable.

While these realities are certainly daunting, they present tremendous opportunities for transformative growth. Within the next year, Forbes reports that the cost of renewable energy will consistently be cheaper than fossil fuels. Considering this, Fettle -a nascent private sector player- exists to pioneer transforming the status quo into a prosperous reality that is powered sustainably.

This presentation presents a case study on renewable energy investments facilitated by Fettle. This will include an in-depth explanation of Fettle's innovative business model that de-risks energy investments in emerging economies, addressing both challenges and solutions. It will also include an opportunity to analyse the potentials and pitfalls of a key £50 million investment in renewable energy in India.

Fettl's business model allows for investments into some of the highest need and highest financial risk jurisdictions. With extensive work experience in renewables and investing in emerging markets, Fettl has identified the following two key barriers:

- Actual and perceived risk in jurisdictions (no matter how well structured the project, some jurisdictions don't attract investment due to the risks of cash flow interruption);

- Small ticket size (the size of the projects, typically between \$5 and \$30 million dollars tend to be too small for investors in Europe and North America).

Fettl's model involves bundling smaller projects spread across multiple jurisdictions into a single investment opportunity for investors. Such bundles will be of an attractive ticket size, and the diversified revenue streams are subject to different risk profiles, reducing the risk to investor returns.

The presentation will then provide an in-depth explanation of Fettl's initial transaction that will facilitate a £50 million investment in renewable energy projects across India including discussion of the range of actors and legal & financing mechanisms brought to the table to reach financial close. This project has positioned a potential additional investment of £500 million within the next two years in India alone and an additional £1 billion in sub-Saharan Africa.

UNEP estimates that the cost of adaptation to climate change is over \$1 trillion per year. Similarly, the funding gap of achieving the Sustainable Development Goals is estimated at \$2.5 trillion. Conventional funding (government, donors) alone are not sufficient sources of capital to address these gaps since their resource pools are simply not large enough. The private sector must play an active role and this presentation will provide a tangible case study that strongly aligns with ICSD's 2019 conference theme.

## The nuclear fuel cycle, conventional fuel, renewable energy and strategic sustainable development

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### **Abstract:**

The much-debated nuclear energy is one of the most environmental friendly energy sources with high efficiency compared to traditional sources of energy. The safety aspects surrounding the nuclear industry still alarms a clear majority of people around the world. When studies about renewable sources of energy are gaining attention this day and age, there still hasn't been a solution to replace the depleting levels of fossil fuels. This work aims to shed light into

the reality of how sustainable each source of energy is, and how our energy demand will vary in the coming future and how earth as a whole, can satisfy the demand.

## Just Electrification: Imagining the justice dimensions of energy access

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### **Abstract:**

Electrification for the world's energy-poor is a key prerequisite for a decent quality of life leading to both human and economic development. Billions of people live without access to modern energy services around the world, the majority of whom in sub-Saharan Africa. In order to address this issue, efforts in energy access, especially electrification for the energy poor, have increased globally. Since the year 2000, around 1.2 billion people have gained access, which was mostly in developing Asia. These improvements were driven by increased reliance on fossil fuel power generation that supplied 70% of the access where coal accounted for 45%, natural gas 19%, and oil 7%. These advancements, though beneficial, revealed the complexity in electrification processes. This fossil fuel based electrification signified the complexities and tradeoffs inherent in energy access planning in relation to environmental, social, and economic factors.

Electrification analysis and planning in the status quo relies on techno-economic methods that only consider engineering and economic criterions. These techno-economic and utilitarian cost-benefit ways of planning are found to be limited in their inclusion of non-cost factors and they fail to engage with human-centered concerns. These limitations in the planning phase result in locally-inappropriate infrastructure being financed further exacerbating access inequalities at the local level. The aim of this study is to provide an approach for a justice-based electrification planning framework that re-conceptualizes the electrification planning and decision-making process.

In this study, I propose a justice-based electrification planning by introducing the concept of energy justice into energy access infrastructure decision-making. The proposed justice-based analytical framework is aimed to support electrification that targets the increment of people's capabilities rather than leading to deprivation - for example, displacement to accommodate inappropriately scaled energy infrastructure - both in size and/or form.

In reconciling the often neglected justice dimensions of electrification with the theories of justice, the study formulates electrification criteria and indicator questionnaire that emphasizes the energy poor's participation in the decision-making process in a meaningful manner from initial project identification all the way through project approval. This provides local communities equal power and ownership over the infrastructure that would ultimately affect their wellbeing and livelihoods one way or another.



## The economic, social and environmental impacts of generalization of Solar Water heaters in Marrakech

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### **Abstract:**

In Marrakech, the sun shines all day, from sunrise to sunset, nearly ten hours. However, when we look up to the roofs, all types of homes combined, solar water heaters are virtually non-existent. Faced with this situation, the question of their absence does not fail to arise. Especially for a country importing almost all of its energy. From there, raises the idea of the existence of a great potential of which we do not profit, namely solar energy.

Needless to say, in this context, SWHs could provide hot water for domestic or industrial use without any contribution of fossil fuels. Their generalization at the scale of the city of Marrakech could be in this perspective the origin of a gain today neglected. The resulting impact, both economically and socially, would be great. It is also beneficial and concerns the natural and sanitary environment. At the level of the city, the direct financial impact of the generalization of CES in Marrakech would be about \$ 15 million. Nationally, the generalization of solar water heaters in Morocco will reduce the national energy bill by 1.3% (0.08% of the Kingdom's GDP). Added to this is, the generalization of SWHs will reinforce the industrial fabric, create the employment especially for the young graduates, the wealth that could be generated, protection of the natural and sanitary environment which could result from it, the comfort as well as the immaterial gains which will take birth and finally contribution to the reduction of global warming and climate change.

## Contribution of Smart Technologies to the Performance of Green Buildings in Social and Technical Aspects

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### **Abstract:**

With the advancement in technology today, the implementation of smart city concept continues to enlarge in several fields such as; security, mobility, education, administration and environment.

In this paper, the effect of smart technologies to the performance of green buildings is assessed in terms of savings in global warming category based on created scenario. Possible savings related to smart technologies in energy saving and water consumption was calculated based on



formed scenario on a LEED Gold Certificated green dormitory building. For the social impact, a questionnaire based survey was applied to the university students and the effect of smart technologies on sustainability behavior is analysed by assessing the data in SPSS Programme. The results of technical and social contribution of smart technologies is presented.

## Identifying and clarifying environmental policy best practices for the mining industry—A systematic review

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### **Abstract:**

Gold mining has for several decades contributed to the socio-economic development of many countries in Sub-Saharan Africa, but it has also caused considerable environmental damage and human health concerns in mining communities. However, despite the extensive proliferation of policies and programs aimed at addressing the adverse environmental impact of mining, limited attention has so far been paid to identifying what might constitute environmental policy best practices across Sub-Saharan Africa's gold mining sector. To address this gap, this paper undertakes a systematic literature review of environmental policy measures and considers its broader implications for sustainable development in the context of gold mining in Sub-Saharan Africa. Of the 1,217 papers retrieved from the databases, 22 met the inclusion criteria and are included in evidence synthesis. Based on an in-depth analysis, we find that there are tensions and consensus in the environmental policy literature. However, extant works remain fragmented, uneven, and not systematically integrated. This perhaps might explain the difficulty in trying to develop and institutionalize best practices within the gold mining industry in Sub-Saharan Africa. As a result, we propose an integrated conceptual model that lays a

foundation for possible environmental policy best practices within the mining industry in developing countries. The paper concludes by identifying specific theoretical and practical implications of the study and suggests possible avenues for future research.

## Progress toward decarbonization: Addressing the energy crisis through affordable, sustainable solutions for impoverished communities in Eastern Europe

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### **Abstract:**

#### Background

The Eastern European states of Bosnia Herzegovina, Moldova and Georgia are characterized by widespread poverty and poor indicators for human and economic development, particularly in rural areas. Georgia is the poorest: 62% of its population, including residents, internally displaced persons, small farmers, migrants and refugees and villagers, live in extreme poverty. Rural poverty is driven by low, unstable incomes, poor access to affordable energy, degradation of natural resources especially soil and water, unsustainable agricultural practices and unsafe water management. Female headed households, children, disabled and displaced people face additional obstacles. Rigid gender roles and entrenched social norms trap women into unpaid, repetitive and laborious domestic work, which limits their time for other activities that could increase income, autonomy, access to resources or decision-making power. Women are primarily responsible for family care, including gathering the wood needed for heating, washing and cooking. Despite spending most of their time on these tasks, women don't manage to meet all the energy needs of their families. Men emigrate in large numbers in search of employment in cities.

## Model of Engagement

CWS aims to reduce rural and energy poverty by promoting innovative, affordable and sustainable “green” technologies which lessen environmental degradation, increase agricultural output and provide economic opportunities through community-based solutions. The program empowers women heads of households, disabled, displaced and young people through vocational training, income generation, skills training, employment creation and the development of cooperatives in areas characterized by extremely high levels of unemployment. Training is given to individuals, households and community groups to build their capacity to manage social entrepreneurship project, sell and market their products. Approaches emphasize holistic approaches, the use of local materials and local, indigenous knowledge, adaptation to local populations' needs and possibilities, respect for local traditions, holistic health, agriculture, eco-sanitation and renewable energy technologies. Community groups and key individuals participated in the identification of pertinent green solutions, and work in close collaboration with technical experts. Women’s practical needs are addressed by the introduction of labor-saving solutions such as solar water heaters and fuel-efficient stoves, with concrete benefits for relatives in their care. Trainings also increase their ability to create business plans, promote rural development concepts, and promote sustainable approaches for agriculture and farming, always using renewable energy technologies. The program trains young people to manage a range of options, including biogas digesters, waste water treatment systems (in Georgia and Moldova) and agricultural cooperatives and market locally grown aromatic medicinal plants (in Bosnia Herzegovina ).

## Expected learnings

Presenters will discuss experiences from the model in Eastern Europe which are potentially applicable to other rurally based, marginalized and resource poor communities, also are characterized by energy poverty and high levels of migration. Its emphasis on sustainable, renewable, green energy solutions; its focus on the economic empowerment of marginalized groups, on gender equality and women’s economic empowerment, make its lessons particularly pertinent to other low income countries and emerging economies now also seeking long term solutions to simultaneously address the energy, climate, and poverty nexus.

## Indigenous Approaches to Sustainable Development

### Indigenous Approaches to Sustainable Development in Nigeria

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**Abstract:**

Indigenous knowledge is passed from generation to generation, usually by word of mouth and cultural rituals, and has been the basis for indigenous development of agriculture, food preparation and conservation, health care, education, and the wide range of other activities that sustain the society and its environment in many parts of the world for many centuries. This study attempts to explore how indigenous peoples respond to ecological and development challenges and how their cultures and knowledge systems can contribute to the sustainable development agenda. At first, it will look at the characteristics of indigenous knowledge and at indigenous peoples' notions of development to understand the concepts in which traditional knowledge is rooted. Then, it will analyse the means of knowledge maintenance and transmission. After that, it will explore the relationship between indigenous knowledge, sustainable practices and land and resource management, looking at the role of community and women as well as at new alternative strategies for sustainable development implemented by some indigenous groups. It is generated through a systematic process of observing local conditions, experimenting with solutions and readapting previously identified solutions to modified environmental, socio-economic and technological situations. It examines the contribution of indigenous knowledge to climate change adaptation and to disaster risk reduction. This will be done through methodical analysis of the impact of mitigation strategies on indigenous populations and on the necessity of guaranteeing full access to land and justice to allow indigenous peoples to fully realize their rights and potentials. The paper concludes with a reflection on the importance of having an integrated system of knowledge, in which indigenous peoples will have the opportunity not only to share their experiences to overcome future challenges, but also to become active agents of change by being involved in the decision-making processes.

Keywords: Sustainable development, indigenous people, culture, indigenous knowledge, development.

## Reinventing indigenous society; A collective journey of introspection and assimilation

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**Abstract:**

Industrial mode of development driven by market and nation-state has resulted in individualisation of the indigenous societies, depleted their traditional skill set, curbed inter-generational knowledge and weakened their collective co-existence. This eventually led to strangulation of key features of the indigenous societies like its social cohesiveness, equality, collective ethos, and its emphasis in the commons. Now this is visible in the crumbling village societies marred with coerced migration and de-skilled tribal farmers across the tribal belt of central India.

Amidst the overriding discourses of mainstream development and fast erosion of traditional ethos, there is a need to ponder and arrive at a better alternate. While indigenous societies are the most vulnerable communities in this mess created by modernisation, they alone may lead a way out of this multifaceted crisis, being the last bastion of agro-ecological knowledge and related institutions. In this paper, we are trying to elicit the processes and attempts made by indigenous communities from Chataniha, a village in Central-India (Madhya Pradesh) through the Adaptive Skilling Action Research (ASAR), which is a joint research initiative of PRADAN- a civil society organisation, Azim Premji University and the villagers from Chataniha. This research paves an alternate way for the above said developmental challenges, by taking the best of indigenous as well as modern approaches to stimulate ideas and prototypes for sustainably integrating life and livelihoods in the forest peripheries.

This research jointly initiates various indigenous approaches for sustainable development of these communities. While introspection of indigenous governing systems lead to understanding of poor participation from different gender, age and caste this action research attempts to ensure participation from all spheres balancing individual aspirations, freedom and ensuring inter-generational knowledge sharing and nurturing cohesive village societies. For example the water crisis of the village was addressed by the women by de-silting a common water body through 'shramdaan'- a voluntary contribution of one's physical efforts for the betterment of the society. The women took the lead to make the whole community irrespective of their age and gender come together. So as to ensure food security as well as to ensure social welfare of all, the women of the village started collective farming and influenced the Government department for availing the best suitable schemes. This helped in cost and labor sharing and also brought in a new identity of a 'women farmer'. The village collective started to sit together to build a better understanding of the socio-agro-ecological systems that they are a part of. All these processes also led to inter-generational knowledge transfer which was in a stand still for a long time. The older generation helped the young ones to understand the importance of the diverse flora and fauna of their ecosystem and a food festival was initiated to promote edible local forest produce.

This paper seeks to explore and analyse the idea, process of reinventing the indigenous systems towards the Sustainable Development Goals (SDGs) in the present times by a community that has been structurally marginalised through various institutions of power over the centuries.

## Accelerating Sustainable Development Toward 2030

### **Submitter: Ben-Meir, Yossef**

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### **Abstract:**

Taken together, the 17 Sustainable Development Goals (SDGs) – contained in U.N. Resolution 70/1 involving the 194 member states and civil society in its deliberation – seek an encouraging level of development of humanity's social and environmental existence. They establish a framework through 2030 that can assist nations and communities of the world in plotting what could amount to transformative, prosperous, and sustainable achievements.

How can this potential development unfold and be long-lasting? What approaches should we catalyze so that sustainable projects result and generate the human development benefits the world's local publics want and need?

As a starting point, most societies have internalized an enduring premise through experiences, particularly since World War II, of social development and reconstruction interventions: people accept and support decisions that they had a part in making. We have learned this critical principle as we have analysed human behavior in our own and other cultures over centuries, and we find this essential premise in texts of philosophy and spirituality of civilizations over millennia. Indeed, this precept is no longer astounding, and is as true as ever.

Plans of development action that directly embody the spoken will of people naturally gain their partnership, energy, and dedication. After all, decisions people contribute to rendering, generally reflect the participants' aspirations and interests. Thus, people's active participation in creating the projects that fulfill the SDGs is ultimately the essential basis upon which the SDGs could come into fruition, expand, and uplift our society and world. The question then becomes: how do we set in motion across lands participatory democratic meetings of local communities of people so that they identify, prioritize, and implement sustainable development projects?

Morocco, for example, has a progressive national municipal charter that is intended to promote inclusive participation. Each municipality is required by law to create multi-year community development plans driven by popular participation. If nations of the world do not embed in their national policies the essential requirement of inclusion in the creation and determination of sustainable development projects, how can we then expect to achieve SDGs when the public is not encouraged to be involved in the determination and design of initiatives?

However, we have also dishearteningly learned in Morocco's case that laws and policies are not enough for the fulfillment of widespread participatory development actions. In fact, the example of Morocco, critically underscores that we must also experientially learn methods (by applying them in reality) of community democratic planning of projects in order for these processes to genuinely take place. We must train our teachers, our youth and retirees, members of civil society and the business community, locally elected officials, women and men, those who have and those who have less, to not only participate in identifying sustainable projects, but also facilitate the dialogue needed in order for all people to come together, speak, argue, reconcile, and achieve consensus with one another. Policies that promote participation coupled with learning by doing is a needed combination that can lead to local community movements toward accomplishing SDGs.

However, even after codifying national policies and building capacities, these two essential components are still not enough for the tangible realization of SDGs. What would become of the designed participatory and sustainable projects without finance to achieve implementation? Even when communities are in a position to provide some work in-kind to help establish their development projects, materials to construct must still be bought, seeds to plant must still be purchased, capital must still be secured in order to enable production.

In Morocco, there is what could become a self-reliant pathway to generate the new revenue needed in order to invest in projects that can achieve the economic, health, environmental, and indirect political impacts of SDGs. The needed finance can be generated by establishing the entire agricultural value chain, from nurseries to market, including growing hundreds of millions of diverse fruit trees that are indigenous to Morocco, such as almond, argan, avocado, berries, carob, cherry, date, fig, jujube, lemon, olive, pomegranate, prickly pear, walnut, and some apple varieties, as well as the more than two dozen varieties of wild medicinal plants.

## Indigenous Approaches to Sustainable Development

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### **Abstract:**

In the context of environmental sustainability, indigenous knowledge is basically looked at to be that unique knowledge which is rather confined to a particular culture or society and that which is passed on from generation to generation. It is as well referred to as local knowledge, folk knowledge, people's knowledge, traditional wisdom or simply traditional science (Senanayake, 2006). Nonetheless, the said indigenous people's culture as well as their respective knowledge systems have been largely misunderstood or even rejected by various scholars and development planning experts in the recent past. There has always been a battle between the two rival arms of indigenous knowledge and science which calls for a concerted effort to narrow the gap of incompatibility between the two by embracing innovative mechanisms that

serve to integrate both systems for mutual benefits (Lalonde, 1991). In Zambia for example, burial sites in the country side are protected by the traditional systems and therefore the biodiversity in around these areas is conserved and it is strongly believed that unnecessary trespass in these areas would actually result in serious catastrophic feedbacks from the “gods”/spirits. The barks from the big *Brachystegia* trees near the burial sites serve a critical role because they provide the traditional coffin material for the dead. Not only this but equally medicinal and fruit tree species are preserved in shifting cultivation which is so pronounced around the rural communities for the enhancement of household food security as well as for the provision of traditional medicine especially to the local and majority forest dependent communities. These include natural tree species such as *Guibortia coleosperma* (Muzauli), Baobab (Mubuyu), *Uapaca kirkiana* (Masuku) as well as *Strychnos coculoides*. Similarly, in most regions, it is a big environmental offence traditionally to cut trees near/along the water bodies. Clean water is always associated with health and thick river bank forests among the local people in the rural areas.

On another level, traditional beekeepers have for a longer period of time being using friendly and sustainable mode of honey harvesting methods using pounded cassava leaves which is smeared at the entrance of the beehive and thus compelling the bees to retreat. This is contrary to the use of fire and smokers which are destructive to bee colonies, the use of cassava leaves and other herbaceous plant leaves have proved to be more sustainable. Through such traditional/indigenous approaches, forest ecosystems, biodiversity as well as the catchment areas are preserved for this generation and the generation to come.

## Indigenous Techniques of Preventing Infant Morbidity in Ibadan, Nigeria.

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### **Abstract:**

Illness is an aspect of “aisan” in Yoruba which means not well or, less often, a description of one of the specific symptoms noted in the negative statements about health (Jegede, 2002). It was observed by Jegede (2002) that some conditions which could have been identified as diseases in medical terms are not regarded as such because they are considered normal under certain circumstances because they are required in the child developmental processes.

It was not known where or when plants first began to be used in the treatment of disease, but the connection between plants and health has existed for thousands of years (Faleyimu and Oluwalana, 2008). Herbal or botanical medicine, or phytotherapy, was defined as “the use of plant materials to prevent and treat ill health or promote wellness” (Ameh et al., 2010). The use of herbs as medicine is the oldest form of healthcare known to humanity and has been used in all cultures throughout history (Barnes et al., 2007). Thus, generally accepted preventive measures in infant morbidity and activities must be sustainable to the creation of an appropriate balance between three main scopes of the sustainability concept which are



environmental, social and economic qualities. Sustainable health as defined by Brundtland as “health status that meets the needs of the present without compromising the ability of future generations to meet their own health-wise needs”. That is why indigenous techniques will be used in the reduction of infant and child mortality as a worldwide target and one of the most important key indices among the Sustainable Development Goals and in achieving the goal three (3) which is to ensure healthy lives and promote well-being for all at all ages. And by 2030, we will be able to end preventable deaths of newborns and children under 5 years of age and reduce neonatal mortality to at least as low as 12 per 1,000 live births in Nigeria.

This study is aimed at documenting indigenous medicinal plants used in the treatment of infant morbidity in Ibadan, Oyo State, Nigeria. Common infant diseases treated with herbs by people of Ibadan, Oyo State, Nigeria includes convulsion, measles, malaria, cough and jaundice among others. The method which would be employed will be semi-structured format of interview which would involve one-on-one interview using the local language (Yoruba). Forty-five plants belonging to thirty-three families are going to be documented alongside with their medicinal use in the treatment of infant morbidity. Overcoming disease and ill health will require concerted and sustained efforts, focusing on population groups and regions that have been neglected using indigenous techniques through phytomedicine to prevent infant morbidity. Information on various recipes would also be documented which would include their preparation, parts used, administration and dosage. Although, there will still be the need for researchers to explore this vital information through scientific validation to the claim of the indigenous people. Also screening, isolation and characterization of active constituents of the plants would give leads in the production of novel drug.

## Empowering Women through Self Help Groups (SHGs) by Integrating Corporate Social Interventions with Sustainable Development Goals (SDGs): A Study of Kalinganagar, Odisha, India

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### **Abstract:**

Over the past few decades there has been a growing concern for environmental and climate change coupled with issues of poverty, increasing disparity between the ‘haves’ and the ‘have nots’, between societies in which business houses operate, tensions caused by social inequalities and unlimited wants that has surpassed the needs thus bringing the cause of ‘sustainable development’ under the spotlight.

At a time when the world recognizes the growth of Gross National Product (GNP), Gross

Domestic Product (GDP) and per capita income coupled with globalization and industrial advancement as a means to understand development, which in turn substantially contributes to individual and societal freedom. But at the same time freedom of individuals and communities also depends to a great extent on expanding human capabilities, achieving universal access to basic needs, and human security and dignity to the masses (Sen 1999).

The adoption of the Sustainable Development Goals (SDGs) in the year 2015 by 173 nations across the globe has marked a crucial beginning towards ending poverty and protecting planet earth while ensuring prosperity for all. The signing of the 'Agenda 2030' by India and thereafter the formation of the 'National Institution for Transforming India' also called NITI Aayog calls for the effective and joint collaboration of the efforts of the government, business houses and civil society in order to mobilise the existing resources that can foster development more sustainably in the interest of one and all.

In the light of the current situation, the growing relevance of Corporate Social Responsibility has been recognised both at the national and international level as a tool for leveraging funds to achieve Sustainable Development Goals. Though Indian history has witnessed a host of philanthropic activities by both private and public houses in the past, yet post the adoption and implementation of Section 135 and Schedule VII of the Companies Act 2013 Corporate Social Responsibility has become a mandated bridge to lessen the existing welfare gap in society through appropriate funding and allocation.

This research paper is a modest attempt to understand the concept of livelihood promotion through the formation of Self Help Groups (SHGs) by Tata Steel, Kalinganagar, Odisha in its Resettlement Colonies by empowering the unempowered and working towards the cause of preserving indigenous communities. As a part of its mandated corporate intervention, Tata Steel, which has a legacy of more than 100 years in pioneering the cause of social upliftment, has been instrumental in promoting quality education, healthcare facilities and livelihood promotion since it began its journey in the tribal centric Kalinganagar Industrial Complex of Odisha.

This study is thus an endeavour to give an overview of the adoption of a cohesive sustainable growth model in the light of Sustainable Development Goals 2030.

Keywords:

Sustainability, Development, Corporate Intervention, Shareholder, Stakeholder, Livelihood Promotion

**Sustainable Use of Forest Resources by Kani Tribes of Tamilnadu, India: A Study on the Indigenous Approach and Transitional Development**

**Submitter: Gopinathan Padmakumari, Sudha**

## **Abstract:**

### Introduction

Kani tribes are traditionally a nomadic community who now lead a settled life in the forest of the Agasthiyamalai biosphere on the southern most part of the Western Ghats. They are a homogeneous community. Kanis today live in tribal settlements called “Kanikkudi” each consisting of 10 to 20 families. 159 tribal settlements are located in this biosphere reserve, both in Kerala and Tamilnadu sides.

As far as Tirunelveli district is concerned, Kani tribes mainly reside in seven tribal settlements i.e., Servalar, Agasthiyar Kanikkudiyirruppu, Kanikatty, Karayar, Chinnamayilar, Periyamayilar and Inchikkuzhi. Kani Tribes secure their food, fodder, medicines and tools and all their requirements for their sustenance only from the forest.

The main objective of this research study is to explore the changing life style pattern of Kani tribes living in the Agasthiyamalai biosphere area, in the part of Tirunelveli district, Tamilnadu, India. As such during the field visit a few case studies have been conducted to substantiate this study.

Kani tribes residing in the deep forest areas are still supplement their food by gathering roots and tubers from the nearby forest areas. It is believed that they are extremely hard working and can survive without the modern technology and facilities. They are socially as well as economically backward and most of them are very poor. Majority of them are engaged in seasonal collection of honey, bee-wax and minor forest produces. On the agriculture side, they cultivate edible plants like tapioca, banana, millet and cash crops like pepper, coconut, areca nut and cashew nut. Kani Tribes use natural resources in the forest with very minimum destruction. They are worshipers and revere of the forest and it's animates and in-animates. Even in the age of modern technology the Kani Tribes do not use any artificial fertilizers. They do not use any pest control. They use only folk remedies to keep away the pest.

It is unfortunate to observe that natural resources available to this Kani Tribes are over – exploited and hence there is a great danger of their extinction. Therefore, measures must be taken to conserve the medicinal herbs and fruits in this area by involving the Kani Tribes both in preservation and conservation aspects.

The Kani Tribes are inevitably facing transition in all aspects of life. Globalization, especially the communication revolution has made indelible impacts on their lives. The younger generation is not much interested on their culture and as such they are severely affected by this impact. The result is that the erosion and dilution of traditional ethics and values exposed by the ancestors. However, some influences from the external world can be beneficial if changes that inevitable can be induced for their sustainable development.

Detailed information on the nutrients and health beneficial components of lesser known fruits and herbs would lead to an increased awareness and may help promoting the conservation of these plants which are presently under threat by human activities. Because, these fruits and herbs can make an important contribution to the sustainable tribal economy and can change the quality of life of the Kani population living in the bio-sphere areas.

It is interesting to note that medicinal plants still play a vital role in the primary health care of the indigenous people. Such studies would help in standardizing traditional remedies and therapeutic efficacy. There is an urgent need to document such wealth of knowledge of the Kani tribes – because the old age Kani health healers are dying with their traditional knowledge.

### Methodology

Case study method has been adopted for the better understanding of the Kani tribes. Observation and focused group discussion have also been useful for collecting more reliable data necessary for the study. Secondary data such as published documents available from Tirunelveli District Forest Office have also been much helpful for understanding the topography, tribal habitation and changing life patterns of the Kani tribes.

### Limitation of the Study

Kani Tribes are scattered in Kanyakumari and Tirunelveli districts of Tamilnadu and Thiruvananthapuram and Kollam districts of Kerala. However, this study focuses mainly on the Kani Tribal settlements of Tirunelveli district only.

### Key Words:

Agasthiyamalai, Kani Tribes, Transition, forest produce, folk remedies

## The United Nations Sustainable Development Goals and the Health of Indigenous Peoples in Canada

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### Abstract:

The United Nations Sustainable Development Goals (SDG) agenda comes at a potential turning point for Indigenous peoples in Canada, who have long experienced socio-economic marginalization and poorer health outcomes than non-Indigenous Canadians. The National Collaborating Centre for Aboriginal Health (NCCAH) has undertaken a process to understand how the SDGs impact the health and well-being of Indigenous peoples in Canada. We have done so through the development of resources and national knowledge sharing activities. This presentation will focus on that work in order to provide an assessment of the current state of

progress on SDG targets for Indigenous peoples, and suggest some ways that the SDG agenda can be used to improve socio-economic and health outcomes moving forward. It will underscore the role poverty plays in the health inequities Indigenous peoples face in Canada and the need to alleviate poverty to ensure they are not left out during the period of the SDGs. The presentation will frame the significance of the SDGs for Indigenous peoples within a determinants of health approach and will be broken into a discussion around the following four themes and specific SDGs: 1) socio-economic marginalization (SDGs 1, 2, 8, 9 and aspects of 10); 2) promotion of health and well-being (SDG 3); 3) equality and social inclusiveness (SDGs 4, 5, aspects of 10, 11, and 16); and 4) the environment (SDGs 6, 7, 13, 12, and 14). The presentation will conclude with recommendations on how to address some of the SDG issues of relevance for Indigenous peoples in Canada. In particular these recommendations hinge on the recognition that poverty and inequitable access to services are crosscutting themes that resonate with the four major categories of SDGs.

### Sports in Development (SiD) as a Community Common Project to build inside and outside collaboration towards their independent approach in Sustainable Development.

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#### **Abstract:**

There are several academic approaches to work on community development, but the following is an illustrative case study, an in-depth and detailed review of how two indigenous communities responded positively to the Sports in Development approach. This project was ran in two Kichwa groups of Ecuador: a) Oyacachi, a highland indigenous community who suffered a mudslide and affected the economy and wellbeing. b) 12 de Febrero-Ruku Kawsay, an Amazon indigenous community that represents to one of those communities left behind for the governmental system and live under poverty). The implementation of Sports in Development represents a new approach to the sustainable development in particular groups like indigenous. In the first case, it was launched to recover after a natural disaster and the second one was a proposal to create a model of an independent, innovative and resilient with stewardship behavior community to finally reach the formation of sustainable destinies and promote with ecotourism and ethno-tourism.

In both cases the goal was to reactivate and activate the drive of development of the community and their Sumak Kawsay (wellbeing in English) of the citizens of these indigenous communities. "Sport in development" has represented a good tool to provide assistance and accompaniment to members of rural communities for the effect and how this attracts to the collaboration of the six sectors (private, public, civic, academia, media and community).

“How did a sport event, impact the communities as a recovery intervention following the mudslide for one side and for the other side to build bases to development?” The major portion of the case study focuses on events prior to, during, and immediately following the event. The final part of the case study presents a model that goes beyond economic recovery, using ‘sports-in-development’ (SiD) to promote a sustainable model for recovery (SD) and for development. The new paradigm that emerged based on this model, identifies resiliency, innovation, stewardship, citizen participation, collaboration and ownership as the main outcomes of this development approach compared with interventions by the central government creating more dependency and unsustainably. This study explains the variety of benefits and opportunities resulting from a sports event that mobilized the community, affirmed their social identity, and produced a sustainable economic and launching their tourism as a main income for both communities.

## Indigenous Approach to Achieving Sustainable Development Goals: The Nigerian Journey.

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### **Abstract:**

Contemporary National development and growth issues center on effective blue print for the achievement of states’ growth and development goals set by any nation desirous of such. To this end, the 17 items sustainable development goals SDGs document by the United Nations provides a framework that has engaged country leaders into new global partnerships for the achievement of sustainable development for their various countries. This paper mainly analyses the nature and content of the Nigerian government middle term plan (2017 – 2020), known as the National Economic Recovery and Growth Plan vis-à-vis the SDGs’ document by the United Nations; the state of affairs since 2015 when implementation began; implementation successes and challenges; as well as the way forward. The paper also analyses various stakeholders’ views in Nigeria on efforts and outcomes towards achieving the SDGs and the possibility of meeting target of 2030 as stipulated by the United Nation. The study is based on interviews with a wide array of actors including Nigerian government officials, academics, politicians, businessmen, and other stakeholders including some members of the public who are supposed to be the ultimate beneficiary of the outcomes of these development goals. The study’s findings which corroborated existing knowledge indicated that though the medium term plan was developed through a wide consultative process, build on previous government plans, and it is aligned with the SDGs of United Nations, however, it was developed against the backdrop of current challenges including Contracting growth, High inflation and interest rates, wide spread between the official and the parallel FOREX rates as well as slowed GDP growth on the one hand, on the other hand, implementation of the development plan is hampered by humanitarian crisis in the north-east with about 15.6 million people currently in need of humanitarian and food

assistance, compounded with herders-farmers clashes and Niger-Delta insurgency.

Keywords: Sustainable Development Goals (SDGs), United Nations, Nigerian Government National Economic Recovery and Growth Plan, Gross Domestic Product (GDP), Foreign Exchange (FOREX) rates, Humanitarian Crisis, Herders-Farmers Clashes, Niger-Delta Insurgency

## Baiga- The Children of the Earth

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**Abstract:**

Background

Bona village is located in south-eastern part of state of Madhya Pradesh. It is predominantly inhabited by indigenous community that was traditionally engaged in shifting cultivation known as Baiga tribe. The people of this village possess profound traditional knowledge of indigenous crops and medicinal plants. The community has rich traditional culture. This is evident from their lifestyle, as women folk are often seen wearing short saree, tattoos and silver jewellery.

Indigenous Practices

A. Community Nexus

Identified as a forest-dwelling indigenous tribal community of central India, Baiga promotes many modes of sustainable living. In their strong, equitable and just community, all the members are engaged in and have authorship of their lives and their future.

B. Knowledge Relays

Erstwhile nomadic hunter-gatherers, who practiced shifting agriculture, Baigas are believed to have received the gifts of rich wisdom vis-à-vis their forest ecosystems. Without any external intervention, they allow the flow of inter-generational knowledges over these years.

C. Self-Sustaining Indigenous Regime

The Baigas not only share a symbiotic relationship with the nature but are also known and admired for their simple and minimalistic way of living with it. The inseparable relationship indicates that peace and harmony are maintained, and the equilibrium is left undisturbed. Their maintenance of ecological diversity and mutualism is unfound and unheard of even in the

developed parts of the world.

#### D. Baiga and Animal Totems

Dharti Mata (Mother Earth's) Totems are the metaphorical representation of the Baiga's culture and depict the steady companionship between them. From flora and fauna, every individual in the tribe is labelled with a totem which signifies their liability to protect the same. They're considered no less than a deity and their deliverance from harm rests on the shoulder of the associated community member.

#### Objectives:

Ensuring steady flow of income through sustainable options of livelihood

Improved agricultural yield to tackle food insecurity

Preserving indigenous crop varieties

#### Proposed model:

A community facilitation centre could be set up with the help of KVK, NIWCYD and TRIFED

KVK will act as a technical body to guide Baiga towards sustainable agriculture using their traditional knowledge about indigenous crops.

Owing to the immense work experience in Baiga Chak, NIWCYD can mobilize and train the community with the help of TRIFED.

Community centre can also facilitate NTFP processing for better market prices along with market linkages.

### Indigenous Approaches to Sustainable Development: Sasi as Maluku's Community-Based Strategy to Environment Sustainability

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#### **Abstract:**

Over-exploitation of the environment has urged the need for a strategy for a better-sustained exertion. This out-of-control usage of nature would put the sustainability of natural resources in



jeopardy along with the possible conflicts that might arise. In Indonesia, this problem has become a long-term discourse. For example, in the maritime sector, Indonesia has the capability to produce 6.5 million tons of fishes each year. To maintain the sustainability of the ocean, the government regulates a limit for fishing, which is 80% of the maximum capacity. However, the data shows that the production of fishes has exceeded the limit with 6.9 million tons of fishes being caught in 2015. The over-exploitation also happens in other sectors, one of which is the forest sector. Indonesia's forest area has continued to decrease since 1990 and reached its lowest number in 2015 with only 910.000 km square forest left. The over-exploitation could disrupt the ecological cycle in the ecosystem, endangering the long-term availability of the resources. The better-sustained exploitation strategy responding to the problem could potentially come from Sasi, a distinct way to maintain the sustainability from the indigenous people of Maluku, Indonesia. Sasi is an effort to preserve the environment by limiting people's access to natural resources in a certain period of time. This will give time to let nature regrow and reproduce without interference. Violating this customs law will lead to social sanctions by the community as it is regulated by individuals, religious institutions, and the local government. The appointed leader then determines the period of Sasi depending on the lifecycle and season of the natural resources. Sasi is a community-based strategy that has better manage the environment usage in Maluku. Sasi has a big prospect of implementation in a broader area in the future due to its involvement of every aspect of the community in both formal and informal sectors. The objects that are protected by Sasi are natural resources that have high economic values. By implementing Sasi, people can have fair and equal access to resources, sustainable use of the environment, and steady income. This paper will explain how Sasi can be an alternative way to maintain the sustainability of the environment and whether Sasi can be implemented in other parts of the world with similar circumstances.

## Public-private partnership in sustainable integrated coastal management through community based dive tourism: Oslob Whale Sharks

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### **Abstract:**

Sustainable integrated coastal management is an accepted model for conserving coral reefs and marine resources in the less developed countries of the tropics. Dive tourism is often cited for its capacity to support sustainable integrated coastal management, yet its contribution to this goal is poorly understood. Here, we examine this issue for Oslob Whale Sharks, a community based dive tourism business based on provisioning (feeding) of whale sharks, off the coast of Oslob, in the Philippines. Using key stakeholder interviews with artisanal fishers, their

community, local government and politicians, we found that by creating a public-private partnership with local government and redeploying traditional fishing occupations, vessels and gear from fishing to whale shark tourism, Oslob Whale Sharks contributes to all nine factors required for sustainable integrated coastal management. Income of US\$18.4m from ticket sales over the 5 years from 2012 to 2016 from Oslob Whale Sharks provides livelihoods, sustainable finance for the management of five marine reserves, enhanced enforcement of fishery and protected area laws and the protection of the whale sharks livelihoods are based on. Oslob Whale Sharks has allowed a group of the world's poorest artisanal fishers to succeed in using sustainable integrated coastal management to link livelihoods with fishery and protected area management and perceived improvements in biodiversity conservation. Local authorities and fishers report their perception that whale sharks are protected from poaching and finning, and destructive fishing is decreased, while fish abundance, pelagic fish species and catch have increased. Our findings further suggest that because there is little evidence that this type of tourism has any negative impacts on the biology of the whale sharks, community based dive tourism can be a mechanism for the delivery of sustainable development, building the capacity of artisanal fishers and communities to achieve sustainable development goals.

## Indigenous knowledge in sustainable: attitude, knowledge and practice in Sub Saharan Africa.

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### **Abstract:**

Over the years sustainable development does not consider culture as an aspect of his success in Sub Saharan Africa. Most of the inhabitants of the Sub Saharan region live in rural areas and they depend directly and indirectly on natural resources for their livelihood; in many ways indigenous people have been isolated especially when it is about the extraction of natural resources on which they are directly linked. It is argued that sustainable development most depend on what indigenous people are doing or how they understand the concept; it is also argued that solutions to problems currently faced by the continent with an eye on Sub Saharan region must proceed from understanding of local capacities such as the role of indigenous knowledge in promoting sustainable development. It is important to engage with indigenous peoples in a manner consistent with their wishes and needs as they perceive them, it has been understood that indigenous people are not only more aware of but also better able to identify their own needs than are outside developers. This can be reached by taking in consideration indigenous capacities to address some sustainable development issues that are currently viewed on the global level. Firstly this paper reconsiders the place of cultures in sustainable development, and explores what we have to know and what we have to do especially when we say that all cultures and civilizations can contribute to sustainable development, in this section the paper asks what we understand when we admit that "Sustainable Development Goals embody a new era of engagement and exploration in pursuit of equality for everyone on our

planet”, secondly the paper asks what indigenous contributions to sustainable development might be, and how sustainable development might be understood and pursued; finally the paper examines the government’s efforts to integrating indigenous knowledge in development programs, and the role of companies working in natural resources industries especially those based in the territories of Indigenous peoples.

## **Sustainable financing of REDD+ activities and indigenous peoples in Central Africa. Added value to the implementation of SDGs in Africa.**

**Submitter: Ngulungu, Alain Parfait**

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### **Abstract:**

In 2002, the World Summit on Sustainable Development established a link between biodiversity conservation, sustainable development and the eradication of poverty. In response to these conceptual breakthroughs linking development to indigeneity, several targets and indicators are being put in place to promote and defend the rights of indigenous peoples (Grace Baruka, 2017).

In this context, the international community adopted in September 2015, under the auspices of the United Nations, the 2030 Agenda for Sustainable Development, a global plan of action for humanity, planet and prosperity for the world's peoples. Next 15 years. The program puts people at the center of development and aims to eradicate poverty in all its forms and dimensions, preserve the environment and ensure the advent of more peaceful and inclusive societies.

In this paper, we present the approach used by projects supporting indigenous peoples in climate mitigation in Central Africa to improve SDG targets and indicators in REDD + pilot areas, including education, health, access to land, gender equality, the fight against poverty and hunger.

This presentation is subdivided into three parts. The first presents identifies and maps the activities of these projects in Central Africa in correlation with the target SDGs (2,3,4 & 5). The second characterizes this added value as an added value to efforts to integrate the SDGs into national REDD + strategies in Central Africa. The final section analyzes constraints and recommends a model for sustainable financing of indigenous peoples' activities to mitigate climate change in Africa.

# Indigenous Approach to Regional Peace and Security for Sustainable Development in West Africa

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## **Abstract:**

It is evident and proven that no society exists without any form of conflict; and apparently, no society thrives without proper measures of managing the different dimension of conflicts prevalent in that society. The nexus between peace, conflict and development determines the level of chaos or sustainable development in any part of the globe. Sustainable development is an outcome of peace and security. However, West African region, just like other parts of the globe has witnessed a lot of social unrest, environmental degradation and armed conflicts that claimed lives, destroyed properties and endangers environmental well-being. No region of Africa or any part of the globe has developed amidst hostility or chaos. Thus, adequate measures suitable for not just West Africa region but African continent are of great importance to ameliorating and managing conflicts and hostility in order to champion sustainable development. The conflicts in West African region ranges from insurgency to illegal migration and human trafficking, dictatorship to monopoly of the use of force from the armed forces, widespread of proliferation of small arms and light weapons to complex humanitarian crisis, weak government institutions to corruptions. Some, if not most of the efforts made towards resolving these issues have been abortive, either because they do not fit in to addressing the unique African/conflict context or it is not addressing the root cause of the problems. Therefore, this study advocates for indigenous approach to regional peace and security for sustainable development in West Africa and African continent at large.

For the purpose of this study qualitative-content analysis research design was used to carry out the research. The study relied extensively on secondary source of data collection; books, journals, online materials, and newspaper articles. Hence, conceptual analysis was used in analyzing the findings of the study.

The study made different finds; first, that conflict in Africa, more especially in the West African region has had a massive impact on the fight against poverty, ultimately stunting the continent's prospects for long-term structural stability and sustainable development. Therefore, conflict has caused the deaths of millions of people, injuries and abuses to countless others and destroyed innumerable livelihoods. The attendant destruction of material resources has setback by many years the vital economic and social development programmes that are so needed to tackle poverty and promote stability on the continent. The above conflicts have always had regional ramifications in Africa at large.

The study recommends that indigenous approach to conflict management is imperative as it would provide better understanding of the regional dynamics of conflict which is increasingly emerging and reflected in policies of the EU and its member states. Notwithstanding that

conflicts are sometimes intra-state in origin; strong cross-border dimensions have often spread to destabilising whole regions.

Key Words: Peace, Conflict, Sustainable Development, West Africa, and Indigenous

## Prospects of Sustainable Development as an Alternative to the Orthodox Conception of Development: A Critical Analysis of the Nigerian experience

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### **Abstract:**

This paper attempted to know whether there are prospects for Sustainable Development as an alternative to the orthodox conception of Development with focus on the Nigerian experience. It endeavored to establish an understanding of the orthodox conception of Development as well as identify inherent flaws in the practice, that warranted an alternative. An attempt was also made to examine the promises that earned Sustainable Development its initial applause. It also examined some of the studies that have been conducted on Sustainable Development concerns in a developing economy such as Nigeria and analyzed the possibilities, or otherwise, of its reliability in place of the orthodox conception of Development. This article explored the research studies of Adejumo and Adejumo(2014), Daramola and Ibeme(2010), Igbokwe –Ibeto , Ighodalo and Oteh (2012), Omole and Ozoji(2014) and Omisore (2017), as a possible mirror of current issues of Sustainable Development in Nigeria. Findings include the observation that Sustainable Development as originally conceived has been consistently dedicated to further entrench the cause of the North. It concludes that what Nigeria, like other nations of the South is contending with is the harnessing of its human resources and the forging of a virile economy with a focus on her shared destiny of economic challenges. While recognizing environmental challenges, Nigeria's peculiar challenges have imposed on it the need to focus on sustained human development. Sustainable Human Development has become Nigeria's alternative approach to development. Sustainable Development may be nothing more than a new incarnation to further the vision of orthodox Development.

## Sustainable Ecological Governance and Reducing Forest Dependency: A Study of Kani Tribes Living in the Agasthiyamalai Biosphere Reserve of Western Ghats, Tamilnadu, India

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**Abstract:**

Sustainability is a multidimensional concept, encompassing economic, social, environmental and other factors. Many environmental issues affect sustainability. The loss of biodiversity throughout the world, due to economic development and other factors, threatens the sustainability. Deforestation and development often lead to the destruction of natural habitats and cause the migration men and animals to suitable environs. The sustainability of humanity implies ensuring an ability of the Earth to support human and activities related to development. Human economies and populations have grown in a way that anthropogenic activities now have global and long-term impacts with various consequences, which can degrade the ability of the planet to support life.

As such, the main objective of this study is to critically examine the relationship between the conservation of bio-diversity and sustainable use of natural resources management. In this context, crisis and livelihood opportunities of forest dwelling communities like Kani tribes living in the Agasthiyamalai ,in the southern part of western Ghats after the implementation of the Scheduled Tribes And Other Traditional Forest Dwellers (Recognition of Forest Rights)Act,2006, has been the primary focus of this study. This study has also strives to evaluate the adequacy and relevance of existing tribal welfare laws and policies.

**The Agastiyamalai Biosphere Reserve**

The Agastiyamalai Biosphere Reserve is located in the Western Ghats in the Southern part of India. It covers the areas of Thirunelveli and Kanyakumari districts in Tamil Nadu and Thiruvananthapuram, and Kollam districts in Kerala. The biosphere reserve was set up in 2001 and covers an area of 3500 sq. km. It has major wildlife sanctuaries and tropical forests that are home to about 2254 species of plants. This biosphere reserve is also inhabited by many tribes and forest dwellers' settlements, amounting up to a total population of 1, 00,000. These communities mainly rely on biological resources and 14 rivers found in the area for their survival. There are five Kani tribal settlements in Tirunelveli areas of Agasthiyamalai i.e. Servalar, Agasthiar Kanikudiyirrupu, Mayilar, Periyamayilar and Inchikuzhi.

Poor living conditions, lack of basic amenities such as education, health and electrification in hilly terrains, nutritional deficiencies, and low literacy rate and migration due to degrading of forest resources are the major challenges faced by tribal people in India. Forest dwellers living in Agasthiyamalai are not an exemption to this.

**Need for the Study**

Though a few research studies are available on the Agasthiyamalai biosphere tribals, they mainly focus either on anthropological aspects or medicinal knowledge of tribals living in this area. The mutual relationship between forest dwellers and forest must be better understood and new Eco-Governance system must be designed in consultation with all the stakeholders that would protect and legitimize the land ownership rights of the forest dwelling communities. It must also be noted that, recent changes in the tribal governance, enactment of Forest Rights Act, 2006 and role and intervention of other stakeholders like judiciary have not yet been clearly documented in a scientific manner.

Moreover, it is interesting to note that no comprehensive study which is exclusively focuses on forest dwelling communities of Agasthiyamalai and implication of Forest Right Act, 2006, has not yet been conducted. This study attempts to emulate an ecological governance model by tracing and documenting the good practices of Natural Resources Management prevailing among the Kani tribes and other forest dwelling communities.

### Methodology

Case studies through field investigation form the primary source of this study.

Secondary data such as published works, articles in the journals, monographs on tribals, and statistical data prepared by the local forest offices have also been utilized to enrich this study.

This research would prove the fact that different forest dwelling communities living in the different parts of Western Ghats must need differential approaches and area specific development programmes and policies, which would address the livelihood issues or Kani tribes.

Not the forest dwellers, it would be the government agencies and the researchers and civil society actors who will be and must be learning lessons from them in the area of sustainable use of natural resources, benefit sharing and caring for other living animals in the forest, water and forest conservation as well as food security and herbal medicines.

Keywords: Sustainability, Ecological Governance, Agasthiyamalai, Case study, Kani tribes.

## Poverty Reduction Through Non-Timber Forest Products Personal Stories

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**Abstract:**

The presentation is about a recently published book that narrates personal stories of people from around the world who have used natural products, in particular Non Timber Forest Products (NTFPs) as a means to come out of poverty. Majority of them are indigenous communities and those in rural areas, cut off from modern development. Their voices and stories are often unheard and forgotten. Ending poverty remains a major worldwide challenge and is the number one goal under the UN Sustainable Development Goals. The book fills an important knowledge gap; that of personal stories of NTFP users. This has not been part of past publications on NTFPs which tend to focus on statistics and analysis of numbers, thus, the human faces of NTFP users are missing. Narrative stories provide a wealth of data about people and their experiences rather than aggregated classifications, categories and characteristics of poverty. The objective of this book is to illustrate the poverty alleviation (Sustainable Development Goal 1 ) potential of NTFPs through documenting the personal life stories of individuals and households that lifted themselves out of poverty through trade of NTFPs.

## Indigenous Knowledge, Creative Industries, and African Development Narratives

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**Abstract:**

The practice of the arts and indigenous knowledge systems have both limited and empowered people in engaging with notions of development in Africa. Arts practice, cultural imaginings, and indigenous “business” shape developmental trajectories in Africa. These assertions mobilize the main arguments and propositions of this paper. The paper offers an exploration of how Africans engage with the notion of “development”, and examines the trade-offs that Africa concedes in such practice. It explores metaphysical landscapes and cultural imaginings that either propel or impede sustainable development in the Continent. The main insight of the project is that cultural practices and indigenous knowledge systems that are not kept in check can compromise the growth of development sectors such as the cultural and creative industries. By extension, the paper looks at global corporate businesses that cash in on Africa’s material culture and accrue huge returns on its indigenous knowledge. It concludes with propositions on ways of transforming the mind-set, reviewing policy, and revamping indigenous practices as steps towards scaling up action for the implementation of the Sustainable Development Goals. Illustrations are drawn from Botswana and other parts of the Continent to demonstrate the role of knowledge systems and creative innovations in advancing the agenda for sustainable development.

## Indigenous Approaches to Sustainable Development: Case Study of Garhwal, Uttarakhand



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**Abstract:**

Water is considered sacred by most populations in the Himalayan mountains.

There is immense local knowledge that has been orally passed through the generations, to rever it and ensure its sustainable supply. The paper and the presentation will focus on such indigenous practices relating to conservation and sustainable use of water and how they relate to the Sustainable Development Goals. It will cover the aspects of water production/harvesting, distribution, storage and reuse. It will show how each of these steps in the cycle of water use has a philosophy of water conservation which are manifested in the form of (physical) structures and (daily or periodic) practices. The presentation will further contextualize these practices in relation to the SDGs.

The proposed presentation is part of the work Nagrika has been doing towards fulfilling our commitment at Habitat III in November 2016 to produce and co-create new knowledge 'from' and 'for' small and intermediary cities. Our commitment was to make the knowledge accessible for a variety of stakeholders for decision-making.

We have been working on a knowledge project to formulate and implement context specific solutions for urban local development that can lead to better utilization of resources in a region . The project is documenting local knowledge and local context as a tool for sustainable urban development.To co-create this knowledge, we have been collating information from formal and informal networks of knowledge and information that exist in small cities in Uttarakhand, a state in northern India with multiple small habitations in the Himalayan mountains.

For the state of Uttarakhand SDG 6 on water security holds significant importance. There are at least 17 major rivers that flow through the state including the Ganges and Yamuna. The state has almost 33,000 square kms of glaciers. Nearly 70 percent of the state of Uttarakhand is covered with forests. The maintenance of these water bodies and sources is important not just for the state but for the South Asian Region.

Uttarakhand is home to multiple pilgrimages situated in the high mountains and adjacent to perennial glacial rivers. The civilisations in these Himalayan mountains go back to 1500 BCE. The indigenous practices of living life embody various sustainable elements through their life beliefs, philosophies, customs and traditions as well as religious practices. The construction of houses, places of worship, public places, storage for water, vessels, as well as the daily habits of people and institutions have traditionally been oriented towards conservation of water.

Based on discussions with individuals and communities, especially aged people from these communities, the presentation will outline key 'Indigenous Water Conservation' practices.

The presentation will shed light on the traditional and philosophical beliefs that underpin these practices and how such beliefs are critical for the practices to have survived over the generations. For example the role of water in traditional rituals during weddings; construction of water bodies and supply systems as part of charity; construction of places of worship at the water sources and so on. It will then try to place the SDGs in this context to critically examine how these practices have and can enable sustainable development.

## Built Environment Sustainability Assessment Program for the Nigerian Building Industry

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### **Additional Authors:**

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### **Abstract:**

As efforts are being made to produce sustainable buildings, an issue of great importance is a need for a meaningful and practical benchmark which measures sustainability performance in terms of identifying both the starting point and monitoring progress. These can be referred to as building sustainability assessment tools. Building sustainability assessment tools are usually developed specifically for their location. Nigeria has no locally based green building assessment or application procedure and The Green Building Council of Nigeria (GBCN) which was recently established has yet to produce an environmental rating tool that could be used to certify projects in the country. Building sustainability assessment tools have been and are still being developed worldwide, providing an effective structure for measuring the environmental performance of buildings and the construction process. This has led to the creation of environmentally efficient buildings thereby reducing the negative impact of buildings on the occupants and the environment. Due to the factors which are assessed to determine sustainability differing in each country or location, for optimum efficiency, it is required for each built environment to have its own specific tool. The main aim of this research is to develop a building sustainability assessment program for use in the Nigerian building industry as this has become necessary because of the environmental, social and economic problems arising in the country at present. This tool will be developed to guide professionals in the building industry in the aspect of sustainable buildings enabling them to implement and see the level of sustainability in their projects from the early design stage to construction, use, maintenance and demolition. Both qualitative and quantitative methodologies will be employed to achieve the main aim of this research. The factors to be assessed in order to determine sustainability will be correlated from a detailed study of prior tools and systems like BREEM, CASBEE,

GBTOOL, LEED and others coupled with empirical data collected from a survey of professionals in the Nigerian built industry about building sustainability. This data will then be used to create a comprehensive programme for the assessment of the building.

Keywords: Sustainability, building sustainability assessment tools, life cycle assessment tool, rating tool, Nigeria.

## HUMAN-ECOLOGICAL RELATION OF TAMANG PEOPLE OF EDUCATING CHILDREN

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### **Abstract:**

Tamang- indigenous group of people are living in the central hill of Nepal have a very complex web of human nature interface of educating their children. Following the traditions of ecological knowledge in bringing up children and educating them have been culturally transmitted, cumulative, multigenerational knowledge is held also by some groups. Traditional ecological knowledge may be considered as a sub-set of indigenous knowledge, defined as local knowledge held by indigenous peoples or local knowledge unique to a given culture or society. Right from the beginning of the birth of the child in the Tamang community, they perform certain rituals which are connected with nature and ecology. The use of plants, soil, water, and air remains the live serving force among Tamang community which was gradually applied in the other life courses of the upbringing of the children. These people do have a range of environmental and ecological practices which shapes the learning and schooling of the Tamang people which could maintain environmental ethics. Believing so, the paper aims at exploring the human-nature interface of Tamang people which promotes sustainable learning and educating children in Timal Rural Municipality of Kavre District. In doing so, the paper employed the ethnographic research approach which generates insights that the human-nature continuum of Tamang people and assesses that of the children in Tamang communities' who have better learning experience which has sustainable learning values.

Keywords: Indigenous, Sustainable Development, Tamang

## Indigenous knowledge and livelihood practices for sustainability: A case study of metalcraft among Newar community of Nepal

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**Abstract:**

This paper offers a case study of traditional metal craft, an indigenous knowledge and practices unique to rural eastern hills of Nepal. These occupational indigenous practices are prominently of Newar ethnic group and their culture. The knowledge, skills, and craftsmanship are unique in sustainability aspects as it embeds the transfer of knowledge from one generation to another along with the reuse of the metal resources. While, such crafts, craftsmanship, and production of artifacts were recorded to decline since 1970s, our field study conducted on 2018 (for exploring and examining the status and condition of traditional occupations in rural Nepal) suggests that there still exists households engaged in these occupations. Further, the skills and knowledge are being transferred from previous generation to the current generations, and, the current generation is learning it effectively in order to enhance their livelihood.

Through this case study, the authors of this paper offer a connection between traditional occupation and local knowledge for sustainability. In general, the case will present a knowledge system that is unique to Newar culture and society and discuss on how the traditional metal craft occupation embed sustained use of natural- resources underpinned by social inclusiveness of concerned actors and institutions and recycling of waste metal products.

The fieldwork for this research was conducted during the month of September and October 2018. The chosen field site was one of the historic towns called 'Taksar' currently in province one, Bhojpur district situated in mid-eastern hills of Nepal. The rationale behind the choice of this site is that this town is recorded to be the historical market place and cultural hub of eastern Nepal. A total of five households currently engaged in traditional metal occupation were included as respondents for this case study. In-depth interviews were conducted, and, each of their narratives recorded. This case study offers a narrative analysis of the narrations given by actors engaged in this traditional occupation and practices.

The case offered here explains that the existing traditional occupation and practices are in general indigenous knowledge owned by the local community in concern. This local knowledge have been used and reused from one generation to another for sustained livelihood and livelihood practices among the community members for the past 150 years. Such knowledge potentially can be transferable across other communities which could help understand the role of local and indigenous knowledge for enhancing sustainable livelihood for communities in rural settings in general and contribute to cultural dimension of sustainable development in particular.

Keywords: indigenous knowledge, traditional occupation, sustainable livelihood and sustainable development.

## **Community-Driven Tiny Houses: Reframing Indigenous On-Reserve Housing for Sustainable Development**

**Submitter: Vas, Erika**

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**Abstract:**

It is a universally declared human right that all individuals have a standard of living, including housing, that promotes health and well-being. This is further recognized as the eleventh United Nations Sustainable Development Goal: “Make cities and human settlements inclusive, safe, resilient, and sustainable”. In direct violation of the Universal Declaration of Human Rights, as a result of colonization, substandard housing issues continue to be a major social issue for Indigenous communities in Canada. The housing issue has not been adequately addressed by the government and may compromise future generations. The last comprehensive analysis of the on-reserve housing issue was conducted in 2012 when it was estimated that “between 2010-2031 there is a projected need for 130,197 new housing units to accommodate household and family growth (not taking into consideration replacements and renovations)”. Promises have been made by the federal government to address this issue with a budget announcement to improve on-reserve housing conditions, reduce overcrowding and increase health and safety”.

With this financial commitment to on-reserve housing, Indigenous governments must determine how to allocate these funds to arrive at solutions that are culturally meaningful. This will require partnerships between Indigenous governments and other stakeholders to implement Indigenous solutions to overcoming barriers, such as insufficient infrastructure, lack of housing programs, and fragmented delivery programs. Additional challenges, including overcrowding, high cost of building materials, limited life span of houses on reserves, and inadequate water, sewage, heat, and electricity services remain highly problematic. The colonial notion of a stationary house, on a fixed area of land, and artificially contrived communities was wrongfully imposed on many communities. This emphasis disregarded the unique cultures of Indigenous peoples, including their strong sense of kinship, familial and community ties and their respect for the sustainability of the land. A community-led solution implemented by several Indigenous communities across Canada is the usage of tiny houses, which may provide an economical, sustainable, and inclusive solution to on-reserve housing. The tiny house movement, also known as the “small house movement” advocates simple living in small, architecturally efficient houses. Complementing traditional housing methods, the benefits of tiny houses also include cost effectiveness, environmentally friendly designs, ease of mobility; and enhances the sense of community through shared space. While tiny house living has long existed, the “Idle No More” protest movement introduced the concept of on-reserve tiny houses through the “One House, Many Nations” campaign. The movement has inspired Indigenous communities to build tiny houses for members, taking housing into their own hands. The implementation of tiny houses enables communities to fully exercise their self-determination and to effectively address community health and wellbeing through community-driven work. Though well-received, critical and evaluative literature on the efficacy of on-reserve tiny houses is non-existent. Furthermore, the availability of on-reserve housing literature is scarce and that which is available is primarily produced by the government. This is

problematic because it does accurately depict on-reserve housing. In this presentation, we ask what are tiny houses, why are Indigenous communities using them, and are they effective?

## Seasonal Climate Variability and Indigenous Climate Risk Prediction Methods of Pastoral and Agro-Pastoral Areas of Somali Regional State, Ethiopia.

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### **Abstract:**

Information related to farmers perception, indigenous climate prediction methods and retrospective relation with observed weather data in the study district is very scanty. To address this gap a study was conducted in Jigjiga district. Both social survey and historical weather data analysis were employed. The survey encompasses Pastoral and Agro-pastoral production system with a total of 96 respondents. A structured and semi-structured questioners, key informants, focus group discussion and field observation methods were used to collect data. Besides, daily rainfall and temperature data for the period 1980-2015 were obtained from NMA of Ethiopia. Descriptive statistics was employed to analyze the survey using SPSS. Climate characteristics such as onset and cessation of the rainy season, length of growing period and dry spell using INSTAT plus software. The result indicated that 93.5% of the interviewed households perceived climate change and variability with a declining rainfall and increasing temperature trend. The analysis of coefficient of variation revealed that Dira' (MAM) rainfall has shown high inter-annual variability with a CV of 33.6% than Karan (JAS) and annual with a CV of 23.8%. The result also revealed that there is significant increment of maximum and minimum temperature. The findings indicated that before 15 April was identified as the starting of rain for 24 years (66.7%) and before 30 April for 28 years (77.8%), For (JAS) before August-15 for 24 years (68.6%), also in the last decade the onset of rainfall shift from March to the April for MAM season and for JAS it shifts from July to August, it shows also short rainy (MAM) ends in the first 10-May the water balance for long rainy season (JAS) completed before 20-September. The finding also indicated that the maximum dry day length was highest in March for short rainy season and July for long rainy season, respectively. The main indigenous forecasting mechanisms follows Islamic calendar called "Hijri"; Astronomical observation and wind direction are the main in this Finding. Lastly the retrospective relationships between these indigenous forecasting systems and scientific forecasting system had a synergy/positive relationship.

**Keywords:** Indigenous knowledge, Pastoralists and agro-pastoralists, Prediction, Rainfall Variability Rainy season.

## Pedagogy & Delivery Methods for Sustainability Education, Training, and Outreach

### Social Impacts of Narrowing Gender Gap in Education: Obstacles and Opportunities for Bangladeshi Female Youth in the Job Market

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#### **Abstract:**

This study focuses on the shifting trends in narrowing the gender gaps in education and its impact on socio-economic development in Bangladesh. Despite the fact social norms and cultural barriers play a significant role in either widening or narrowing the gender gap in a country, specifically for a developing country like Bangladesh, still Bangladesh has made significant progress over last sixteen years between 2000-2016 in narrowing the gender gaps in education. The first part of this study focuses on the literature coverage, annual report, journal articles, and newspaper coverage regarding key shifting trends on narrowing the gender gaps in education for Bangladeshi youth ages between 15-24. The second part of this study focuses on how the narrowing gender gaps in Bangladesh impact gender equality in the workplace over the same period. The third part of this study focuses on the disparity in getting equal opportunities for youth in the Bangladeshi labor market, regardless of the significant improvement in narrowing the gender gap in attaining education. Finally, the last part of this study addresses the fewer studies, journal articles, annual reports, and reviews that focus on this issue of narrowing the gender gap in education but are not translating in narrowing the gender gap in the labor force. The outcome of this study is to create appropriate awareness and policy reformation in Bangladesh in order to reduce gender gaps in the labor force to ensure equal participation and ultimately attaining sustainable socioeconomic development for the country.

### Silencing Environmentalism

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#### **Abstract:**

Silencing is a strategy – both legal and political – used against the critics of the corporatist system, which capitalizes upon and targets marginalized communities and vulnerable populations. Yet the impacts of these incidents are also environmental in that these incidents worked to silence environmental work and to demonstrate adverse impacts of climate change on frontline communities. That is, vulnerable communities, located in “sacrifice zones” have less of a right to be here – in the United States or on the planet – and, therefore, require less of

a need for a clean environment, including clean air, clean water, and energy access. The law operates as “a virtual anarchy of claims about rights, justice, and communal responsibility and expectations, which the law, in turn, attempts to contain.” James Epstein considers stories and songs to “reconstitute communities of resistance.”

This article explores ways that environmentalism through activism, advocacy and litigation is silenced. Part I considers the impact of silencing of environmental work and the ways in which it is done by deploying the study of rhetoric and power in the narrative form. Part II of this Article considers and surveys SLAPP suits, RICO cases, FARO actions, ICE raids, and other methods used by governments and corporate entities to limit, delay, and thwart efforts of environmental work and the environmentalists themselves. Part III of this Article analyzes ways that communities internationally have fought against efforts to silence environmentalism with case studies from India, Turkey, Bhutan, and Singapore and what communities in the United States can learn from these efforts.

## Sustainability principles in agriculture training

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### **Abstract:**

Sustainability values and entrepreneurial skills are central to poverty and violence reduction and it could be a solution to improve the quality of education. Especially, in poor zones fraught with violent conflict that has been reducing the food security in Central America. The responsible management that contributes to improving social wellbeing is sustainable when it is ethical.

In agriculture, the historical principal incentive to produce and behave has been the economic return which explains the unsustainable practices, demands, and beliefs. Because of that, it is proposed that agricultural education needs to reinforce its content and pedagogy with the sustainability principles of entrepreneurial skills and sustainability values transversally in all academic program. However, the relationship between entrepreneurial skills and sustainability values has been unsatisfactory explored in academic research. Indeed, how does it could contribute to sustainable production and consumption in Central America has been lightly mentioning in agriculture education.

The contribution of this proposal to theory is to provide on the ground considerations of how sustainability values and entrepreneurial skills could enhance the content and learning process in agriculture education. Since the decision makers on the main agriculture universities were interviewed, it is expected that they lead this educational improvement and continue to research the potential limitation that it could have in each Central America country.

**Keywords:** Agriculture education, entrepreneurial skills, sustainability values.



## Sustainable pedagogy – the results of local-expert leadership in Kuthambakkam

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### **Abstract:**

Abstract for International Conference on Sustainable Development

Results of local-expert leadership in Kuthambakkam a semi-rural Indian village – A model of Sustainable Development Goals in practice.

If we are to meet the Sustainable Development Goals, and adhere to the agenda outlined in the Paris Agreement, we must learn from successful models of sustainable communities that significantly pre-date such documents. Kuthambakkam, under the leadership and guidance of a local-expert leader in Dr Elango Rangasamy provides a real world case study of successful address of the SDGs. The Gandhian and Marxist influenced network economy model has been growing for over two decades. Through stages, the efforts of the leadership and community have provided significant improvement for residents - aligned with SDG targets. Sustainable Holistic Economic Development (SHED) is being achieved using Dr Elango's network growth economic model in a resource-poor and complex cultural context.

The plenary provides an argument for appropriate recognition of the value of such efforts, and the need for greater focus and attention from the international development community to expand the model exponentially.

National Taiwan University International Program in Climate Change and Sustainable Development (IPCS) has formed a partnership with Dr Elango Rangasamy and Kuthambakkam to increase exposure and resources for the uptake of the network growth economic model. Dr Elango has trained many Panchayat leaders through the Panchayat Academy. IPCS are building online education tools that can be utilised by villages all over India and around the world. These tools increase opportunity for people to gain greater understanding of the practical steps required to achieve sustainable development in their village or region.

The materials developed will also hold significant value for application in higher education institutional systems. Students of sustainable development programs can gain from exposure to a model that has a measurable, practical and rational development framework. Kuthambakkam

is a living example of successful address of the SDGs. The key factors of an holistic approach, reliable leadership and ownership through community participation are exemplified in the Kuthambakkam model and highlighted in the online learning tools.

The education of the SDG framework to marginalised and disadvantaged communities is another impactful feature of the partnership. The SDG targets are linked through the learning tools to provide inter-connectedness between activities on a community level and actions of state and international actors. It is vital for both sides to understand how their work contributes at the other end of the spectrum.

This plenary will summarise the history of the relationship and display some of the tools developed through the IPCS – Kuthambakkam partnership.

## Unreliable Electricity in Tertiary Institutions, possible causes and the impact on the standard of Education: Case study: University of Nigeria

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### **Abstract:**

A major contributing factor to the ineffectiveness of Nigeria's power network is energy theft that directly effects the revenue generated by the energy distribution companies thereby stalling the development of the power sector. The need for reliable power supply cannot be over emphasized as it is an unavoidable prerequisite to any nation's economic development leading to poor educational practices. It has been observed that no electricity means that the internet cannot be accessed. The internet today is one of the most widely used educational tool. With the lack of sufficient electricity, the economic impact is felt directly by the students who have to look for alternative sources of energy in the form of fuel generators to proceed with their laboratory practical's and have immense security issues relating to the lack of power. The availability of internet access is also hindered making it impossible to access the World Wide Web for resources important to their learning process including the submission of assignments. The unreliable power at the University of Nigeria has a direct impact on the students and staff as well. A number of students were interviewed on how the lack of electricity effected their education and surprisingly all of them resident in the University explained that it had a negative impact on them both mentally and financially. The delivery of standard lectures to becomes tedious and research and development activities is greatly hindered. The major causes of the unreliable electricity is highlighted in the day to day activities of the Academic community. A solution using solar energy is proposed as a solution in the course of this paper in order to sustain the effect of unreliable energy in order to maximise student and staff productivity.

## Investigating the Impact on Visitors' Environmental Attitudes and Behavior through Innovative Interpretive Media

**Submitter: Dong, Xue**

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### **Abstract:**

How to use innovative interpretive media to achieve environmental education outcomes at parks? It is time to take advantage of the digital functions of mobile technology to attract people to explore outdoor environments. Join us to explore more possibilities to change visitors' environmental attitude and behavior! State parks provide a good opportunity for communities to connect with nature and learn about their natural environment through interpretation and education programs. Interpretive media designed for these outdoor settings could be upgraded to achieve environmental education outcomes.

The Nature-Deficit Population is Growing. While people may know about global environmental issues, they have lost direct touch with nature. With the Nature-deficit generations becoming more addicted to smartphones and novel applications on mobile devices, it is time to take advantage of the digital functions of mobile technology to attract people to explore outdoor environments. This study is designed to apply QR codes to four newly designed interpretive signage and evaluate the effectiveness on changing visitor's attitude and behavioral intention toward environmental issues. In order to collect both quantitative data and qualitative data of perspectives from sampled visitors, this study included focus groups, observations, surveys, and semi-structured interviews. The observational data was gathered through trail cameras to count the number of visitors and the holding time on each newly designed sign.

In the summer of 2018, I surveyed and interviewed 1,006 visitors and got observation data of 2,875 visitors at Green Lakes State Park to assess perceptions of the environmental issues about meromictic lakes. The results shows a great increase in the second phase when visitors interacted with interpretive signs with QR codes compared to the first phase without QR codes. For example, the distribution of pretest's staying time ( $\mu=31.24$ ,  $SD=6.92$ ) and posttest's staying time ( $\mu=37.39$ ,  $SD=5.68$ ) for newly designed Sign #1 indicated that the average staying time increased in posttest. A one-tail t-test conducted on the final scores of the pretest and posttest ( $p = 0.000104$ ) showed there was a highly significant difference.

In spite of concerns about poor environmental manners, positive attitudes towards lake conservation initiatives were typical. I recommend an integrated approach of preventative and mitigative measures to reduce problems and maintain support for conservation in the scenario that almost three quarters (72.8%) of the sampled visitors did not have a clear awareness of lake conservation and 61.8% of interviewees were dissatisfied with amounts or processes associated with park management.

## Teaching Sustainability: Modern Challenges for the Baltic States

**Submitter: Eteris, Eugene**

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### **Abstract:**

**Aim & Objective:** Sustainability issues do not occupy a priority role in the Baltic States due both to economic reasons and the SDGs interdisciplinary nature. Teaching sustainability (TS), can become a pivotal “instrument” in changing existing paradigm. The task is complicated enough as the TS shall include numerous scientific fields of natural, technical, social and political character. Besides, the TS shall include the SDGs’ implementation process which requires new approaches to traditional political economies and combined Baltic States’ strategies. The presentation shows the perspective TS methods in resolving new pedagogical challenges in line with the reviewed national growth strategies.

**Structure & goal:** The presentation analyses the Baltic States’ involvement into SDG strategies (so far being insufficiently “SDG-oriented”). In some states national SDGs are only in the making, and only few universities are having SDG courses. Sustainable growth in the Baltic States’ governance still lacks adequate support and solutions, mainly due the lack of funding. As to the TS, most of the educators/teachers are still within a linear market economy practice, which do not allow for revolutionary approaches to modern SDGs.

Alongside national specifics, TS are already having some common denominators in the Baltics: e.g. in energy and transport sectors, as well as in economics, including sustainable development practice, circular and bio-economy. It is important that the TS shall be based on learning by good examples: positive examples are evident mostly in Estonia with Latvia and Lithuania lagging behind. TS is going to assist people in new jobs and skills in sustainable economies, while providing learning and training in a new “sustainable mindset”.

**Results:** The presentation’s outcomes are of a triple nature: a) showing the Baltic States modern socio-economic-political challenges in implementing SDGs; b) suggesting new teaching and learning methods; c) increasing role of science and research in progressive TS.

The author suggests a new “social contract” in SDGs being oriented: first, towards making living places healthy and comfortable; second, on circular and bio-economies; and, third on inclusion of SDGs and global climate goals in political guidance.

Modern TS cannot proceed along classical lecturing methods: a combination of modern digital technologies, new political-economy methods and sharing best-practices are needed. The new forms of teaching and learning can help students to deal better with SDGs complexities: in line with the breaking the “business-as-usual” approach, the TS shall review the “education-as-usual” concept.

The following suggestions in the conclusion: - transforming national primary, secondary and

higher education systems according to SDGs; - embedding SDG-related knowledge in the learning curriculum and other teaching activities; - providing SDG-knowledge to national leadership and decision-makers.

## Low Resource Ecosystems and Health Education: Multilaterism for Sustainable Development and Global Health

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### **Abstract:**

With the ratified declaration of the United Nations' 2030 Agenda for Sustainable Development, member states avowed a universal set of 17 interdisciplinary goals that empowered stakeholders to structure and tool inclusive approaches to improve the survivability of the planet whilst increasing the quality of life for all. In Sub Saharan Africa, health pedagogy and science literacy stands as fundamental drivers of deterring a myriad of regional contractions in health, from HIV infection to unwanted pregnancies. Persons living with HIV/AIDS burden harrowing consequences that often involve severe comorbidities that supplements strain upon household income furthermore negatively affecting gross macroeconomic metrics. Currently, the Republic of Nigeria is the most populated nation in Africa coupled with the highest HIV/AIDS mortality rate; therefore, we evaluated and optimized existing public and private partnerships between a variety of nongovernmental organizations and stakeholders, and through exhaustive consultations with Nigerian participants, our team developed a culturally competent sexual health curriculum to increase science literacy of HIV disease transmission whilst driving down the incidence of newly diagnosed HIV cases. Since the average national school life expectancy is only 8.5 years, with a corresponding literacy rate of less than 50% for females, we underscored sexual health issues fashioned for both young women and girls, to increase aptitude and knowledge sharing of sexual and reproductive health rights among other social signals such as consent, and relationship skills with young men and boys. We collectively converged upon three Sustainable Development Goals (SDGs) that included Good Health &

Well-being (SDG3), Quality Education for All (SDG4), and Gender Equality (SDG5). Altogether, culminating in the cursory enrichment of sexual health literacy, whilst strengthening regional and national economic outputs by preserving a healthier, more sustainable workforce to improve both micro and macroeconomic metrics, underscoring returns on investment when institutions provide the necessary securities to health services and education.

## Analyzing the Primary Education System in Light of Achieving Sustainable Development Goal in India

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### **Abstract:**

The quality of education of people holds the key to achieve sustainable development goals especially in developing countries like India where it has the potential to eradicate several other problems persisting in the society. It is often observed that without having a strong foundation in the education system other socioeconomic and environmental problems cannot be resolved. Hence, this study makes an attempt to examine the trends and patterns of primary education in India and identify and analyze the factors influencing the outcomes of primary education and its significance in addressing the sustainable development goals in India. Using the time series data on education from the year 1990 to 2012, the paper estimates an econometric model on the outcomes of primary education. The results indicate that there exists a statistically significant relationship between education expenditure and population growth with net enrollment in primary education. The model satisfies more than 89% of the variations in the enrollment of students in the primary sector. The overall model is statistically significant at the level of 5%, implying that the results are robust and consistent. The study indicates that education expenditure and population growth are the two main driving forces of the primary education system in India. In addition, in order to further substantiate the above findings and delve deep into the issue, a qualitative analysis is carried out. In this context graphical presentation relating to primary education, parameters are plotted against various government policies implemented, which allow us to examine the effectiveness of the execution of government policies. For example, we have related the various inflexions in the graph of Net Enrollment in primary education versus subsequently increasing years based on the launch of District Primary Education Programme (DPEP), Sarva Shiksha Abhiyan (SSA) and the 1991 economic crisis. We were able to justify these inflexions as a result of these major happenings. Other than this, various other indicators which define how well an education system is performing in a country

like the Gender-parity index, Pupil-teacher ratio etc. were also analyzed. It is observed that government have consistently launched schemes in order to improve primary education but unfortunately the effectiveness of these schemes confined to only enrollment in primary schools and not continuing it to the secondary level, which is the main bottleneck towards achieving sustainable development goals. The alarming difference between enrollment in primary and secondary education calls for introspection. One probable solution could be to launch targeted programs focusing on minimizing the drop-outs rate during the transition phase from primary to the secondary sector of education.

## Eco-Literacy for a Sustainable Development of Amazonian Biome

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Lifelong expert in Amazonia and Climate Change, worked with institutions as PNUD, USAID and GIZ. Now CEO of my own Project in Putumayo Colombia.

### **Abstract:**

The goal of my conference is to expose the importance and loss of the systemic function of the Amazonian Piedmont Biome, which is key for the permanence of one of the most important ecosystems, able to keep in equilibrium the global climate. This ecosystem is a complex of wetlands in the Guamuez Valley (Colombia) forming a biome which is located between the Putumayo and San Miguel rivers (South of Colombia), constituting one of the most perfect refuges or biodiversity deposits in the world, converging fauna and flora hosted from long time ago, derived of the flood caused by the melting of the last glaciation. This shelter like the Macarena and the Chibiriquete, represents itself the highest diversity of the Planet. Located in the Guamuez River Basin is a large wetland staircase detached from the Colombian Massif, up to the lower bed of the Putumayo and San Miguel rivers. This is a complex that has a systemic function in the regulation of water and deposit of materials (minerals and organic) contributed by the largest fluvial star of the continent. For this reason, the Guamuez Valley is one of the most important connectors between the two largest biomes that regulate the continental water cycle, in addition to the transcendental role of the forest in the control of GHG. Sadly, this ecosystem is currently the most intervened due to the dynamics of coca cultivation, deforestation and potrerization. Intervention that goes hand in hand with a deep ignorance of the "plot of life", poverty and the formation of a mafia thought that has taken over society. For this reason, existing scientific knowledge must leave the auditoriums and be massified as a survival action of the BIOSPHERE, so that it is understood that the human species is at risk in the face of the acceleration of global warming produced by this intervention. For this, it is urgent to advance in a strong way in an Early Eco-literacy process for our new generations of the Region, that allows the human being to find its systemic function, through a synergistic



interaction with all the other components of the System. Only ECO-LITERACY will allow us to synchronize our objectives and equifinality as a species with the rest of the local ecosystem, especially with the other elements of the Climate System. But this is only possible with an educated or informed society, our proposal is to introduce into the life of the human, from its embryonic development, an Early Eco-literacy process, with pedagogical techniques and virtual tools such as artificial intelligence, that bring us closer to an environmental culture, that modifies our way of intervening the ecosystem. Our purpose is the official declaration by the RAMSAR Convention, of the Guamuez Valley wetlands as a protected system such as the "Cuyabeno-Lagartococha -ASUMÍ Wetland Complex", already in the convention, to allow us to guide relevant educational resources and culturally appropriate to the ethnic and cultural diversity of the area.

## Implementation project educators at school of Climate Change education

### **Submitter: Lucien Blaise, Koon**

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### **Additional Authors:**

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### **Abstract:**

In 2015, the world made a commitment to educate, train and obtain public participation and access to information on climate change (art.12 Paris agreement) and education development goals (objective 4 and target 4.7 sustainable development goals 13). Climate change education begins at schools (UNESCO 2016) and required new approaches to learning to make sure that they understand. A global partnership is needed to empower teacher to build inclusive and resilient society. Teacher face to challenge of anchoring sustainable development in real life situations. The competency based in effect since 2014 is ineffective. Integrating environmental, citizenship and human rights modules into learning, teaching and evaluation process remains an issue. This project presented during the recent regional training on Climate education at school which takes place in Cotonou, on November 2018. It was considered Best practice by francophony organization, on education sustainable development and Africa Union. In 2016, our structure organized a consultative workshop to bring the decision makers. The fifth participations all teachers signed the Douala declaration. There are no transition without education. This pre Cop validation workshop took place in a context of weak electricity supplies. There are another threat, the floods. Douala city is may disappear under the weight of waters. If nothing is done in Upstream. Plastic pollution population pressure on wetlands are one of the causes of climate change.

After describing some problems that degrade the ecosystem and biodiversity, what should be



done to overcome the challenge of inaction? As a reminder, since 2014, ANDSE has been a partner of the Global action program of ESD( GAP). The launch of this program took place in April 2015 on the occasion of the end ESD decade (2005-2014) and the launch of educators and trainers of the future on ESD. The general objective is to introduce climate into continuing training. In terms of specific objectives, this project aims to integrate ESD into existing program at the primary and secondary levels in Cameroon. Promote environmental education and sustainable development and Climate science, to set up educational project on the climate.

To achieve these goals, our network undertook to organize training and Conferences to build sustainable teachers knowledge. Teachers and tools will be able to empower young people. Our structure is committed to ensure that learning gain the knowledge and skills, and values needed to build a sustainable future. Target 13.3 encourage to transforming teaching and and learners environments through education climate change education.

In the framework of this project, mix but significant results were achieved.

## An engaging way to translate the SDGs into national and regional priorities

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### **Abstract:**

The Sustainable Development Goals (SDGs) represent the politically negotiated global consensus on our Grand Challenges until 2030. Focused on reducing the gap between the global North and South, the SDGs are proven difficult to apply to every single nation. The GAPFRAME is a normative framework that translates the SDGs into relevant measures for each nation and as a basis for a strategic business tool, highlighting the gap of where we are today versus where we need to be so that all of us can live well on one planet.

The GAPFRAME identifies a “safe space for all of us” and serves as a basis for multi-stakeholders to address these Grand Challenges, by sector, across industries, for an enterprise or as a responsible management educator, building on the “outside-in” perspective of true business sustainability. Check-out this tool which reflects a multi-sector research effort spanning across 155 countries and 24 Grand Challenges, including national priorities. The true viability of the GAPFRAME comes with an expansion of users, who are invited to join expert panels that will upgrade this current version in 2018 and thereafter.

The GAPFRAME translates the Sustainable Development Goals (SDGs) into four sustainability dimensions: planet, society, economy, governance, enclosing 24 issues and 68 underlying indicators. The 24 Grand Challenges are assessed for 190 countries, 22 regions and the world.

The Gap Frame identifies a “safe space for all of us” and serves as a basis for multi-stakeholder coalitions to address relevant global challenges. This can be done by sector, across industries,

for an enterprise or as a responsible management educator. It has been defined as a tool for business strategy development in the sustainability field so far. But how can it be put to use in an educational context? Beyond first order changes (bolt-on solutions) simply by adding a course or module featuring the Gap Frame and other relevant process tools, we want to focus on applications in the area of second order (built-in solutions) and third order (platform solutions) changes:

1. The Gap Frame as a tool to frame and understand the Global Goals as defined by the SDGs
2. The True Business Sustainability typology (BST 3.0) as a way to re-define long-term opportunities for business that directly connect to external social, governance, environmental and economic issues
3. The Collaboratory as a process tool to include multi-stakeholders in prototyping ideas derived from an ideal future, resulting in measurable goals for business
4. The SDG Compass enriched by the above three methods representing a long-term strategy tool for business Third order change: platform solutions
5. Integrated teaching & learning, and research applications that combine a number of tools into a broader platform solution at the school, program or course level
6. Integrated applications of the Collaboratory for industry-wide solutions across business schools regionally and globally

The poster will outline opportunities and best practices in higher education, as well as opportunities in secondary education.

**Information and communication technologies for education (ICT4E) in low income countries: how can technology make a difference?**

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Mr. Sergio Donati, MDP Student, Trinity College & University College Dublin and Plan International Ireland

**Abstract:**

## Research Aim:

This research investigates how technology makes a difference in education in low income countries, and aims to illustrate how ICT4E programming can affect education quality, access and equity. Evidence is drawn from low- and middle-income countries that highlight the benefits and barriers of ICT4E implementation. The main objectives are to

- (i) address the knowledge gaps,
- (ii) identify tools and resources for programming, and
- (iii) inform Plan International Ireland's (PII) conceptual framework for ICT4E programming, particularly in West Africa.

## Methods:

A desk-based qualitative literature review was undertaken, focusing on knowledge gaps in ICT4E, tools and resources for programming, and evidence from low/middle-income countries across Africa, Asia and Latin America. Relevant, reputable and/or published documents (not older than 2009), alongside material shared by PII, were referenced.

## Results:

Despite the huge potential and the heavy investments in ICT4E in both developed and developing countries, there are significant knowledge gaps and the real benefits of implementation are not always clear. Where high-tech solutions seem to be successful and comprehensive initially, they are often not cost-effective nor practical in rural settings; due to the lack of infrastructure and support available. ICT projects must take into account the local context, as well as existing technologies that are accessible and being utilised.

## Discussion:

The SMS Story Project in Papua New Guinea and the National Education Programme for Illiterate Youth and Adults through ICT in Senegal were identified as the most practical and applicable solutions that PII should consider adopting/adapting. These initiatives are cost-effective and scalable, having the greatest impact on education quality, access and equity in under-resourced settings.

## Gender based violence and the culture of silence amongst Niger Delta women

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**Abstract:**

This study examined gender based violence and the culture of silence among Niger Delta women and identified its implications for social work practice. The study focused on three purposively selected states in the Niger Delta, Nigeria namely Rivers, Bayelsa and Delta States. It adopted the social anomie theory which examines the patterns and dynamics of social interactions and its relevance with norms and societal values. Descriptive and qualitative research designs were adopted. Three key research assumptions guided the study while primary and secondary sources of data collection were used. Our primary sources derived largely from direct field data. Questionnaire was administered to 1,200 participants in the study States, the sample size was derived through the Taro Yamane statistical tool, while our qualitative data were analyzed using simple percentages and tables. The major findings of the study showed that gender based violence and the culture of silence among Niger Delta women have adverse effects for women's transformation. This among others has implications for social work practice. Based on the findings, the study drew conclusions and recommended some strategies to engage social workers to mitigate gender based violence

## Teaching and Learning: Getting it Right with Transfer of Knowledge on the SDGs at the Primary and Secondary Educational Level in South-Western Nigeria

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**Abstract:**

The primary aim of imparting knowledge is to see it being put to good use, thereby yielding positive and visible outcomes. In achieving learning in any setting, the right teaching style (pedagogy) has to be adopted depending on the peculiar circumstance. This underscores the need to recruit well qualified teachers in schools in order to transmit knowledge properly to students. Sound and accessible education is not only a laudable goal but also serves as a key enabler to achieving the sustainable development goals. Hence educational systems should necessarily include relevant learning objectives and contents by incorporating appropriate pedagogies. This has in a little measure been put in place in Nigeria as the National Primary School curriculum used according to a 2003 UNESCO report has been improved. It includes a variety of subjects that foster different thought patterns which can be channeled by teachers to helping pupils understand issues in relation to the global goals. Likewise, the secondary level of education is established with the aim of preparing students for useful living in the society. This provides a good window of opportunity for students at this educational level to be acquainted with possible roles they can play in the near and far future in addressing global issues. It is therefore important that teachers have a basic understanding of the Sustainable Development Goals (SDGs) in addition to mastering different teaching styles which will help empower learners. Oftentimes, public school teachers in South-West Nigeria have confined themselves to the theoretical and abstract parts of courses taught; an anomaly that has the consequence of creating yawning knowledge gaps in the mind of students as correlation between the classroom and the real world is not clearly presented. The obvious side effect is a veer off the road map

that leads to Nigeria's attainment of the SDGs in an inclusive and people centered manner. This error therefore calls for a review in the teacher training curriculum as well as an improvement in the teacher development or continuing performing development schemes. This paper highlights the low awareness level of the SDGs among pupils of primary and secondary school age in South West Nigeria. It identifies the appropriate pedagogy styles in teaching the SDGs considering the different age range and educational needs of pupils. It is recommended that teachers are trained for new integrated knowledge, mindset and skills set on the SDGs. Also, engaging electronic sources in teaching will help to creatively broaden the minds of these students on the SDGs.

KEY WORDS; Pedagogy, Curriculum, SDGs, Primary Education, Secondary Education

## **A Global Voice for Survival: An Ecosystemic Approach for Communication, Advocacy, Public Policies, Research and Teaching Programmes**

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### **Abstract:**

Evidence shows that the paradigms of growth, power, wealth, work and freedom embedded into the dominant political, technological, economic, social, cultural and educational systems are actually responsible for degradation of quality of life, increased urban violence, chaotic system of production and consumption, energy squander, deforestation, mining expansion, hazardous wastes, pesticides, pollutants, global climate change, diminishing biological diversity. Communication, public policies, research and teaching programmes should embed an ecosystemic framework to deal with governance policies, lack of pluralism in decision-making, internal incoherence, historical injustices, asymmetries of knowledge and power, a long-standing reproduction of subalternity, unequal sharing of benefits, vested interests of established corporations that destroy cultural relationships, land and territories, in the benefit of commercial demands for exported commodities. An ecosystemic approach, encompassing all dimensions of being in the world (intimate, interactive, social and biophysical), is proposed to deal with environmental problems, quality of life and the state of the world, encompassing environment, health, politics, economics, culture, education, ethics and overall quality of life. The dynamic equilibrium, complementarity and mutual support of all dimensions are considered: deficits and assets are assessed, connections strengthened and ruptures sealed, as they evolve as donors and recipients and combine to induce the events (deficits/assets), cope with the consequences (desired/undesired) and organize for change (potential outputs). To develop awareness, interpretation and understanding, beyond established stereotypes and taken from granted views, "path breaking" development of new socio-cultural learning niches

provide new structures of thought and action, in view of the transition to an ecosystemic model of culture. Challenges are conceptual, more civic and political than technical; the proposal extends to environmental problems, quality of life and the state of the world a larger conceptual framework encompassing ontological and epistemological issues, in view of the isomorphy and transfers of concepts, laws and models; it highlights how taken-for-granted worldviews, values and perceptions affect the definition and treatment of the problems by communication, advocacy, public policies, research and teaching programmes in the contemporary world. The proposal favours societies which invest in each other, in view of new forms of being-in-the-world, not in mega-projects with intensive use of resources.

## Student's attitude towards environmental awareness following STEM based educational intervention: evidence from a student survey

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### **Abstract:**

Science Technology Engineering and Mathematics (STEM) based educational activities have been known to have a positive effect on students' performances at school. Such events also raise students' interests in STEM-related fields. Impact of STEM-based educational activities on grades, academic achievements, high school dropout, college enrollment, attitudes toward society, drug and substance abuse amongst others have been widely studied. However, there are very few studies that explored the impact of STEM-related educational intervention on students' perception of environmental awareness. Moreover, we are unaware of any studies that investigated students' attitude toward the environment in underrepresented communities. Therefore, little is known about the factors that impact a student's perception of environmental awareness particularly in underrepresented groups. To address the research gap, we surveyed students who participated in the STEM-based field trip, which was focused on terrestrial and aquatic ecology. The main objective of the study was to investigate the factors that impacted the change in students' perception towards environmental awareness in underrepresented

communities. To study the change in perception of environmental awareness following the field trip, we carried a survey before and after the trip. From the survey, we selected the five most important questions using principal component analysis followed by stepwise regression analysis. We found students from higher grade were more likely to believe that environmental threats were a concern. They also believed that environmental problems could be solved without making large scale changes in their life. We also found that intrinsic factors such as parents' education and occupation played a crucial role in shaping their environmental awareness. Students whose parents worked in a STEM-related field believed every individual could make a significant contribution towards environmental protection. Students whose parents had an education in the US were more willing to make sacrifices to solve environmental problems. Exposing students to such out of class activities such as field trips can be a medium of environmental education particularly in underrepresented communities.

## Population, Sustainability, and Intergenerational Transfers

### Population Dynamics and Poverty Reduction in sub - Sahara Africa Countries: What can promote sustainability of economic development?

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#### **Abstract:**

Early economists attribute growth of nations to large population; in view of this, large population is desirable for labour to enhance food and industrial production. The ultimate aim is to have increased national output through increased labour brought about by large population. This made nations with lower population but high technology to develop speedily and emphasis on the need large population was played down. Large population was seen as a burden by population pessimists. This position may not be completely ruled out, as studies have shown that there is an inverse relationship between population growth and economic development. Contrarily, studies also show that population may influence economic development positively if the structure of the population is put into consideration giving rise to the "demographic dividend hypothesis". The argument is that population may lead to higher growth if the structure of population have large working age group compared to non-working age group. Evidence from literature has shown that the structure of the population has a relationship with economic development of nations. Also, the structure and composition of population cannot be divorced from fertility and mortality rates of countries. The present population was determined by past fertility and mortality rate, likewise, the future population will be determined by the present fertility and mortality. The demographic transition theory explains how countries move from high birth and death rate to a lower birth and death rate as they develop from pre-industrial societies into a developed industrialized economy. Recently, countries have emphasize not only on economic growth of nation's and regions but sustainable development. This requires a careful look at the present dynamics of the population which will not amper development goals set to be achieved in 2030. SSA is a region known for its slow



economic growth, poverty and high population. Incorporating population dynamics into sustainable development will help to shed more light on sustainable development issues and be a pointer to achieving the goals. The question is what aspect of population influences economic development? Hence, this study examines the relationship between population dynamics and economic sustainable development. This paper examined the effect population dynamics (structure and composition) on poverty reduction in sub-Sahara Africa using balanced panel data covering twenty-four countries and over a period of two decades (1997 - 2017). We adopted system-GMM for the analysis. We discovered negative effects of population structure of ages 0-14years and 65years and above, on poverty reduction, while income level, birth rate, fertility, death rate and population structure of working class (15 -64year) had positive effects on poverty reduction. This study recommended formulation of policies that will discourage excessive increase in dependency component of population in sub-Saharan Africa if development sustainability is the focus

## The Relationship between Physical Activity levels and Obesity status of Factory Workers in South western Nigeria.

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### **Abstract:**

The aim of this study is to assess the physical activity level and obesity status of some factory workers in south-western Nigeria. Adults with varying working conditions (senior staff/ junior staff) were randomly sampled from two factories (A food company and a Pharmaceutical company). Their physical activity level was estimated using the long format of the International Physical Activity Questionnaire (IPAQ). Diagnosis of obesity and abdominal obesity was done using the WHO standard recommended method of determining of body mass index (BMI) and waist circumference (WC) and subjects were classified into 3 BMI groups underweight, Normal and overweight/obese. A total of 158 adults were recruited for this study but 8 had incomplete data.

In women, the prevalence of overweight/obesity ( $BMI > \text{or} = 25 \text{ kg/m}^2$ ) is 41.9%, higher than in men 39.5%. The prevalence of abdominal obesity (waist  $> \text{or} = 88 \text{ cm}$  in women and  $> \text{or} = 102$  in men) was higher in women than in men (45.2% vs. 9.2%). The overall overweight/obesity is 40%

The overall level of physical inactivity in the study is 24%. Thirty six (24%) of the subject had no physical activity, 12.7% (19) had insufficient physical activity, 38.7% (58) had moderate PA, while 24.7% (37) had high physical activity. There existed a relationship between the recreation physical activity level (PAL) values and the BMI groups ( $P < 0.05$ ). However, there was no statistical relationship between Total PAL and BMI groups.



It is suggested that further studies been done to investigate the reason why 24% of the study population had sedentary lifestyles and policies be formulated to drive the adult population to engage in active lifestyles.

## Reasons to develop sustainable mining in South America

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### **Abstract:**

Mining activity in Latin America, especially in Chile, Peru and Argentina, has grown during the years 1992 – 2010. Financial investments were promoted due to increasing prices of metallic minerals, especially gold and copper, the potential natural resources of the countries, economics reimbursement, financial and legal benefits given to investors by these governments. The papers selected fore view describe the particular phenomena detected in different countries where the mining activity has different effects in the communities surrounding the deposits. However, the similarities of the mining effects on the communities surrounding the mineral deposits of the cases studied permit the comparison of countries with different cultures, economics and social aspects, but with similar needs. This review will help to analyze mining activities towards a sustainable and multidimensional approach that will justify this study. The review is based on the concept of “weak sustainability” , a version of sustainability which can be defined as “the obligation to leave to the next generation all resources necessary to ensure the same standard of living as ours and promote in a similar manner to continue into following generations”. The growth of local and national gross domestic products (GDP) from mining activity does not ensure a “trickle-down” of equal economical magnitude to people’s standard of living, because it depends on the redistribution of the wealth generated by the mining activity. This phenomenon was indicated by a great number of researchers who studied different countries where they observed that the growth of mining activity was not reflected in the improvement of the standard of living of the surrounding community of the mineral deposits. This phenomenon is repeated frequently in all countries studied especially in those which are in the process of developing. Mining contributions realized in Latin American countries have not been enough for local communities, and they could not perceive the benefits of this economic activity, as tax and non-tax contributions and social and economic contributions, including corporate social responsibility, failed to compensated the loss of the wealth of their natural resources. Therefore, these contributions were not enough to transform natural capital into a social and economic capital. The different phenomena associated with weak state apparatus to implement economic, social and environmental proactive politics has limited the present and future development of the communities surrounding deposit sites. Therefore it is vital to evaluate the effects of different

contributions that mining industries can make to surrounding communities. To conclude, the concepts described by this review are associated with the environment, since environmental degradation inhibits the realization of capabilities and does not ensure environmental, economic, political and social sustainability, because it may trigger social conflicts which not only affects the expression of capacities, but also the system's integrity.

## Perceived city opportunities: A study developed in Ruminahui, Ecuador

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### **Abstract:**

In the last decade, rural youth feel encouraged to migrate to urban areas motivated for the lack of employment, lack access of services and in bad infrastructures that they had in the communities (FAO, 2018). Rural Young migration is decreasing the number of people that work in agricultural business (United Nations, 2016) Ecuador is a small country of around 17 million of habitats and has two main cities: Guayaquil and Quito. While the rate of urbanization remains lower than the countries next to it, the development of internal migration is constant, as well as the proportion of the population that lives in cities is projected to increase in the future. This study used as a theoretical framework the Theory of Planned Behavior (Ajzen, 1991). This study is focused on how youth perceived the opportunities cities have and their intention to migrate to those places. Finally, about 10 percent of the Ecuadorian rural population perceived a better life in urban areas and are planning to migrate, this phenomenon has experienced an impact on internal population flows (Royuela & Ordóñez, 2016).

### **Purpose:**

The study aims to compare and determine what is the Perceived City Opportunities that youth with agricultural education had and youth with other technical education from Ruminahui, Ecuador have and evaluate if there is a relationship between their Perceived City Opportunities and their intention to migrate. Three objectives have been established:

- 1) Determine the relation between Perceived City Opportunities and Intention of Migration to urban areas in youth with agricultural education.
- 2) Establish the difference between Perceived city opportunities in youth with agricultural rural education and youth with other technical rural education.
- 3) Compare the difference between Intention of Migration in youth with agricultural education

and youth with other technical education.

### Methodology:

For this quantitative study, the population (N=215) was composed of high school students from two rural communities in Ruminahui, Ecuador that had similar socioeconomic characteristics. One group have a formal agricultural education (n=104) and the other group have other technical education (n=112). The instrument has 7 constructs that were created by experts in the topic, and pilot tested to have validity and reliability in the study. This study was conducted after IRB approval was obtained. Data were analyzed using SPSS v.25 and the following statistical analyses were conducted: descriptive statistics, correlations, and independent T-test.

### Finding

The majority of the participants were female (54%), male (46%) and most of them live in a different place where they born (52.3%). Results of objective one shows a negative correlation between Perceived city opportunities and their Intentions to migrate in youth with agricultural education, ( $r = -.30$ ,  $p = .001$ ).

Results of objective one found a significant difference ( $F = 10.14$ ,  $p = 0.02$ ) in the scores between rural youth with agricultural education ( $M = 2.60$ ,  $SD = .66$ ) and rural youth with other technical education ( $M = 2.49$ ,  $SD = .48$ ); ( $t(214) = -1.41$ ,  $p = 0.02$ ) concerning their Perceived city opportunities. This show that youth with agricultural education perceived that the city has better opportunities for them, that youth with other technical education. In contrast, results for the Intention of Migration reveal that there was not a significant difference between youth with agricultural education and youth with other technical education.

### Conclusions and Recommendations

The result of the relationship between youth perception of city opportunities and their intention to migration is negative moderate, this show that even student with agricultural education consider the opportunities that city can gave to them, they prefer to stay in their communities; this phenomenon need to be considerate for future interventions that allows to knowing more about rural migration.

Based on the Theory of Planned Behavior (Ajzen, 1991), the Attitudes, Subjective Norms and Perceived Behavioral Control are important for predicting the Intention of Migration. For instance, the results show that the Attitude was perceived with more opportunities in the city; the Subject Norms reflects a positive influence of people close to them, but their Perceived behavioral control change the way they act, because they consider difficult to migrate, basing on their actual situation, changing their decision.

## Factors Influencing the Choice of Family Planning and Its Effect on Childhood Education in Rivers State, Nigeria

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### **Abstract:**

The impact of population control on education is an inevitable issue and straight forward as it entails the availability and proper management of resources for effective human capital development as a means to empower the present and future generation. Family planning as a means of population control is one of the effective means to control population in a very populous environment where the natural forces of morbidity and mortality rate are not effective and improved health facilities are provided to curb both. Even though there has been increase in public awareness and the provision of family planning facilities, social factors like education, religion, cultural belief, number of living children and socio-economic status affect the effectiveness of this method. This study seeks to understand the various social factors affecting family planning practices among eligible couples in urban and rural communities and ascertain the impact of these factors on childhood education in Rivers State, Nigeria. To achieve this, this study makes use of questionnaire, in-depth interview and secondary data sources. The association between the variables (correlation) and analysis were done with the use of SPSS and Microsoft Excel 2010. The preliminary result shows that majority of the women were aware about contraceptive method. Higher level of contraceptive method acceptance was evident among older and more educated women while low level of acceptance of contraceptive method were observed among women who had low socio-economic status and low literacy level. Health professionals play the most effective role in motivating women to adopt family planning methods. Children with more educated mothers and high socio-economic status obtained high literacy level and quality education. This calls for better focused re-orientation through proper knowledge development in the area of family planning and empowerment of female to engender better educational opportunities for the future generation.

Key words: Population Control, Education, Family Planning, Rivers State, Nigeria

**Socio-Econo-Engineering: What is the right dose of capitalism regarding fertility? Recommendations how to use capitalism for population control and how to avert the falling rate of fertility in capitalist territories**

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**Abstract:**

In a realm of literature on influence factors on fertility rates; this paper innovatively introduces capitalism being associated with lowered fertility rates. Based on a 180 country strong worldwide data set and cross sectional correlation studies, this paper outlines that hallmark pillars of capitalism are all negatively associated with fertility rates. The 2017 Economic Freedom Index – comprising of input variables such as property rights protection, judicial effectiveness, government integrity, fiscal health, freedom of business, labor, monetary policy, trade, investment, finance, taxation, GDP freedoms as well as FDI inflows – is significantly negatively correlated with fertility rates around the globe. Based on a 139 country strong worldwide dataset on industrialization as measured by the UNIDO in the Industrialization Intensity Index of 2014 and fertility rates, a highly significant negative relation is found between industrialization and fertility rates around the world. Urban areas around the world tend to have higher fertility rates and access to markets within rural communities lowers fertility rates measured by the World Bank Rural Access Index for 64 countries around the world. The inverse relation of economic freedom and fertility was also found for 50 U.S. states based on the 2017 Economic Freedom Index and fertility rates in the United States. The historic examples of communism imploding giving way to free market mechanisms but also an Islamic regime changing towards a Western free market approach captures capitalism to crowd out fertility in a meta-analysis, which also finds higher education levels not being stringently related to fertility rates. Industrialization, globalization and capitalism lead to vanishing populations. Being occupied by production and consumption but also the entertainment of capitalist markets, economic mobility and international trade may distract societies to prosper regarding fertility. Focus on competing in markets may hinder from procreation. Equilibria und markets may have an undocumented negative effect on fertility. Unruled capitalism may lead to a falling rate of fertility, decimating the populace and eventually also the reserve pool of economic agents. The paper concludes with proposals how to use these novel insights as (1) birth control mechanism in those parts of the world, where overpopulation is currently demanding governments to find ways how to lower the fertility rate and (2) means to avert the falling rate of fertility in capitalist societies with a shrinking, aging population. Infusing capitalistic market freedoms in birth control needed territories but also taxing capitalist activities to fund parenthood through direct investment in social benefits and/or via subsidized parenthood to alleviate the tendency of the falling rate of fertility in the eye of capitalism is recommended concurrently, depending on the starting level on the overpopulation-low capitalism versus under-reproduction-high-capitalism spectrum. Revealing the found mechanism has also implications for advocacy to strengthen fertility and the intergenerational glue in light of vanishing populations in the Western world. In addition, the findings have innovative and futuristic prospects in the age of artificial intelligence. Robotics and artificial intelligence slowly taking over human capital labor activities but not being able to reproduce a human DNA is argued to increase the future value of humanness – and with that human fertility – in the artificial age.

[Urban Forest Cover Changes using Remote Sensing in Democratic People's Republic of Korea](#)

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**Abstract:**

As the world's urban population has been growing, new challenges have come up, the impact of urbanization on the environment. Since urban green spaces play an essential role in sustainable development and quality of life in cities, there have been numerous efforts to increase green spaces including parks and gardens. Democratic People's Republic of Korea (DPRK) has also tried to make cities green since the late 1990s in line with the change of forest policy from economic utilization of forest resources to forest protection. This paper examines urban greening activities reported through media and urban forest cover changes using remote sensing in the DPRK. First, we investigated accessible media sources such as official newspapers and press regarding urban greening to figure out urban greening activities. With the information, second, we selected study areas, 12 major cities including the capital city, two special cities and nine provincial capital cities. Subsequently, we performed estimation of forest land use and land cover (LULC) changes in the study areas by using NDVI-derived classification with Landsat data from 1990 to 2018 and using Object-based image analysis (OBIA) techniques with recent high-resolution images. The result shows that DPRK has implemented a lot of urban greening projects as DPRK's official newspaper, RodongShinmun, since 1988. We found that overall forest cover of the total in the study areas has decreased by 1.6% from 1900 to 2000 and increased by 5.2% from 42.2% to 47.4% from 2000 to 2018 even though the whole forest cover of DPRK has been continually decreasing. In conclusion, this research indicates that introduction and implementation of urban greening policy and increase of urban forest cover in major cities in DPRK since 2000.

## Responsible Consumption and Production

### Influence of strategic inter-organizational relationships on smallholder market performance in the Nigerian shrimp and prawn sector

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**Abstract:**

The current efforts to simultaneously improve production and smallholders' market performances tend towards more complex inter-relationships. Yet, informally coordinated smallholders are characterized by poor market performances and widespread poverty. This study seeks to better understand how and when complex inter-organizational relationships influence smallholder market performances across mutually reliant tiers. The study proposes a conceptual framework and empirically test the research model using data obtained from a standardized survey of 405 small-scale producers and 238 processors in the Nigerian shrimp and prawn sector. Results of the Partial Least Squares (PLS) estimations indicate that the predominant external contingencies of the supply chains and valuable internal resources available to smallholders influence both their inter-organizational structures and market performances, even though, trading partners are mutually reliant. These results generate several managerial and policy implications regarding how to improve smallholders' market performances by overcoming predominant external supply chain situations and effectively using valuable internal resources.

### Life Cycle Assessment (LCA) of a Packaged Fish Spiced Biscuit

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**Abstract:**

Life Cycle Assessment is a tool for assessing the stages of a product and minimising the impacts of human activities from resources and energy consumption on the environment. The stages include raw materials acquisition processing/manufacturing, transportation/distribution, use/reuse/maintenance, recycle and disposal. The adoption of the LCA techniques have been used in a variety of purpose with respect to the ISO 14040/44 standards identified in four phases as goal and scope definition, life cycle inventory, life cycle impact assessment and interpretation of the impact assessment. LCA study is considered data intensive that requires the material, energy and water input to balance the emissions and waste generated there from. In view of this the planning phase is considered to have a great impact on the final result.

This research work assessed the unit process involved in the life cycle of packaged fish spiced biscuit, to which its production processes is similar to all products brands delivered by confectionaries for distribution in order to determine the environmental impacts associated with each of the unit process using the system model. The study was from cradle-to-grave of the product system involved in packaged fish spiced biscuit. Primary data for biscuit production, raw material acquisition as well as waste management activities were obtained from the actual producer. Aspects of emissions from product system to land, water and air and subsequent waste generation were examined and quantified for activities. Available data on raw materials,

energy use, water consumption, waste generation, products and by-product were utilized to determine the material balance in order to achieve sustainable development.

The study identified steps to take that was given as recommendations to reduce the impacts of production and movement of product brands on the environment.

Keywords: Life Cycle Assessment (LCA), Sustainable Development.

## **Sustainable Consumption and Environmental Citizenship in Developing Countries: Evidence from Assessment of Knowledge, Attitude and Practice in the Use of Non-Biodegradable Plastic Carrier Bags in Ondo State Nigeria**

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### **Abstract:**

#### **Introduction**

Environmental Citizenship centres on the consciousness of a collective group, community, business and individuals on the state of the environment and the deliberate role they have to play in ensuring environmental well-being. Achieving a balance between consumption and environmental quality is one of the basis for sustainable development. A self-deliberate action that an individual can take is to engage in sustainable consumption. The environmental citizenship domain is still not well defined while tools for assessing the status of a community or individual are few with little or no consensus on what should be the standard. There is also a paucity of studies on environmental citizenship in developing countries and in the study location. This study attempted an integration of sustainable consumption and environmental citizenship through the lens of a case study on the use of non-biodegradable carrier bags in Akure, Ondo State, Nigeria.

#### **Methodology**

This cross sectional study evaluated the awareness and responsibility (knowledge) of 250 shoppers selected through multistage sampling from twenty (20) supermarkets of various sizes on the concept of environmental citizenship and sustainable consumption through the use of a questionnaire. The Intentional and meaningful environmental behaviour (attitude) of respondents to sustainable consumption with regard to collection of plastic carrier bags during shopping and the method for the disposal of such bags upon use was assessed using the PEN-3 Cultural Model. The determinants of respondent behaviour with respect to sustainable consumption was assessed. The 20 businesses used were assessed for their business model whether it encouraged sustainable consumption and their willingness to adopt new processes or change an existing one completely if shown to be unsustainable. The data collected was



analysed using SPSS-22

## RESULT

Existential attitudinal factors were the major factors responsible for negative consumption habit. Eighty-five (85%) of respondents have no knowledge of environmental citizenship while 60% of this group claimed to have indulged in meaningful environmental behaviour in the past such as re-use of non-biodegradable carrier bags and safe disposal of bags. More than half (65%) of the respondents expressed desire to know more about the concept of environmental citizenship while only 10% agreed that activities that contribute to climate change can be controlled through the concept of environmental citizenship. All the businesses involved in the study were prepared to be part of an environmental citizenship initiative provided it will not increase their production cost.

## Conclusion

It is evident that the concept of environmental citizenship is still novel to many people in the global south and that there is a huge prospect for its adoption if appropriate advocacy mechanism is put in place for its propagation. The concept will also be useful in shaping consumption in the global south.

## Assessing the Impact of Psaltry Outgrower Scheme in Enhancing Cassava Farmers Productivity and Sustainable Livelihood in Nigeria

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### **Abstract:**

Nigeria is applauded as the world's largest producer of cassava, but ironically, she scores low in the global market for cassava value added products. A vibrant link must exist between cassava producers and processors to attain appreciable growth in the nation's cassava value addition pursuit. Hence, the need to assess the impact of Psaltry cassava outgrower scheme as a potent model in facilitating such linkage.

Cassava has the potential to increase farm incomes, reduce rural and urban poverty and help close the food gap. Without question, cassava holds great promise for feeding Africa's growing population.

However, Cassava processors often face problems in sourcing adequate quantity and

appropriate quality roots for processing. This results in inadequate processing capacity and lower net profit potential for processors. To mitigate these constraints, cassava farmers seek to embrace outgrower schemes to meet the demand of the consumers and their ends means.

Outgrower schemes are systems that link networks of unorganized smallholder farmer with domestic and international buyer. Also known as contract farming, these schemes provide benefits to players along the supply chain. Buyers can improve their control over crop supply, often access more secure markets, often receiving technical and financial support by cultivating within outgrower schemes. When effectively designed and well managed, outgrower schemes can address numerous sustainable agriculture objectives. They can facilitate greater private sector investment in developing countries like Nigeria, improve sustainable sourcing practices by bringing smallholder farmers into mutually beneficial partnerships with large buyers, and increase smallholder farmer incomes by improving yields and quality through training access to credit and markets. Psaltry has a robust out-growers' program. The out-growers are located around 80km radius from the factory in 4 different local governments, 8 clusters and 50 farmers' organization covering more than 20 villages.

Simply random procedure was used for the study, 150 outgrower from Psaltry outgrower scheme. A total of 57 non-outgrower were proportionately selected from contiguous communities. Focus Group Discussion was conducted with 50 outgrowers from different clusters and Key Informant Interview KII with extension personnel as well as actors along the cassava value chain. Data were analysed using descriptive and inferential statistic such as ANOVA and T-test

The result revealed that outgrowers' participation in scheme management was high while most had a favorable perception towards Cassava Outgrower Scheme COS. Prominent among benefits derived by outgrower were guaranteed market, exposure to improved technologies and access agri-support services which also served as determinants for their participation in the scheme. Contrariwise, a larger category of non-outgrowers had low productivity, access to these services. A larger category of outgrower rated effectiveness of Cassava Outgrower Scheme COS in the study area as high. The findings of this study conclude that impact of Psaltry outgrower scheme was high while there are still more rooms for improvements.

Keywords: Outgrower scheme, user-companies, cassava value addition, value chain guaranteed market.

## Implications of Nature of Firm ownership on Environmental Sustainability

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**Abstract:**

The global effort to combat environmental pollution and climate change requires all firms' strong commitment and participation. However, it is unclear as to how firms with different ownership types contribute to this endeavor. In this study, we contrast foreign and local firms' role and contribution with regards to key dimensions of environmental management: specifically, extent of environmental practices implementation, the strengths/influences of the drivers and barriers affecting that implementation, and the associated environmental, cost-related and organization-related performance benefits realized. Hypothesized differences between the firms on these dimensions were assessed using 395 responses collected through a structured questionnaire in the United Arab Emirates. Foreign firms were found to have significantly greater levels of both 'external' environmental practices implementation, namely eco-design, environmental purchasing, environmental transportation, environmental manufacturing, and end of life environmental practices, and 'internal' environmental practices implementation, namely environmental management system (EMS) and ISO 14001, environmental training, environmental auditing, cross functional integration, and environment-related R&D. Also, foreign firms were found to have greater internal drive to implement environmental practices, both from an environmental commitment perspective, and in achieving business benefits. In addition, foreign firms reported lower barriers in implementing environmental practices such as shortage of environmental professionals, shortage of local environmental/green suppliers, high cost of implementation, and lack of knowledge and awareness. Local firms on the other hand were found to be not too far behind foreign firms on each of environmental, cost-related and organization-related performance benefits, though there is significant room for improvement for both foreign and local firms in terms of all three performance aspects. In an era of increasing globalization, liberalization, and foreign direct investment, this study is timely, and offers useful insights to policymakers and practitioners to make informed actions, strategies and policy interventions, so that foreign and local firms can contribute to a greener economy. For example, foreign firms may be viewed as a diffusion mechanism to transfer their environmental-related knowledge, expertise and skills to local firms.

## Glass Recycling in Hong Kong: A Grassroots Movement

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**Abstract:**

Hong Kong is a bustling international hub with a glaring waste issue. The small island has already filled 13 of its 16 initial landfills, and Hong Kong's Environmental Protection Department estimates the remaining three will reach capacity within a few years. The most prominent plan to address this inevitability is the construction of an incinerator to burn 30% of the city's waste. The incinerator would introduce a slew of issues, including worsened air pollution for a city that

already suffers from poor air quality. It is clear that Hong Kong would benefit greatly from increasing their waste diversion from landfills, and the Hong Kong government has established a \$1 billion HKD fund to bolster the city's recycling sector. All but missing from the conversation, however, is glass recycling. Glass is not included in the set of materials recycled through the city's collection system. As a result, 93% of glass, mostly bottles, is disposed instead of recycled in Hong Kong, adding over 300 tonnes of glass to the landfills daily. This represents about 3% of Hong Kong's daily municipal solid waste that is not being addressed. However, the capacity for recycling glass is readily available—Tiostone Environmental is a private nearby glass recycling plant that crushes glass for use in manufacturing high-quality paving bricks. Unsurprisingly, the plant operates far below capacity because so little glass is recycled in the city. Due to the government's inaction in creating a stream of recycled glass, the onus falls on the residents to fill this gap. I founded Glassroots Glass Recycling Hong Kong, a Non-Profit aimed at increasing the amount of glass sent to Tiostone for recycling in Hong Kong. The organization operates by a two-pronged approach: infrastructure and awareness. To provide Hong Kongers a channel to recycle their glass, we created a third-party glass recycling system. We established glass collection points in residence complexes and buildings throughout the city where residents can deposit their glass. This glass is then picked up by a coordinated schedule of trucks and transported to the Tiostone facility for recycling. Glassroots has also conducted awareness campaigning for residents to utilize this glass recycling infrastructure. Through speaking engagements and promotional events across the city, my team and I have spread education about the importance of recycling glass in Hong Kong and how to do so. On the commercial side, we arranged an agreement for restaurants and bars in a high-traffic district to set aside their glass bottle waste for our team to collect and send to Tiostone as well. Through our efforts, Glassroots has demonstrated a growing community of Hong Kongers who contribute to the sustainability of their city by recycling their glass in the absence of government support. In this presentation, I will detail the waste issue in Hong Kong and the story of Glassroots. As I learned, Hong Kongers can be particularly apathetic to sustainability concerns, and I will also share the challenges and insights of building a grassroots movement in this environment.

## Sectoral Composition of Growth and External Debt (ED) Reduction: Evidence from Selected African Countries

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**Abstract:**

In this paper, we investigate the impact of the composition of growth on external debt (ED) reduction in a cross-sectional panel of 34 countries, spanning 1990-2016. The motivation behind the study is to determine which sectors have the higher capacity to reduce the levels of ED in the face of high debt stock and weak revenue base facing the African continent. Applying the generalized method of moments (GMM) estimation technique, the results showed that the composition of growth has significant impact on the levels of ED in a country. Specifically, our findings revealed that among the three key sectors – agriculture, industrial and services sectors, the industrial sector's impact is highest in the reduction of ED. This result has serious policy implication for a continent like Africa that relies so much on the export of primary commodities. The study therefore recommends that for African countries to meet their debt obligation and mitigate future fiscal imbalances, a strong policy commitment that emphasizes the generation of domestic revenue through production and export of secondary commodities will greatly assist the continent in the management of its ED profile.

JEL Classification: C33; F34; O41; O55

Keywords: Panel Data; External Debt; Economic growth; Africa

## Applying the 'Doughnut Economics' Model to Corporate Social Responsibility – Contributing to Responsible Production

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**Abstract:**

Increasing responsible consumption and production requires decoupling economic pursuits away from traditional growth targets and toward an equilibrium balancing social and environmental responsibilities alongside profit. Businesses are a source of tremendous potential Sustainable Development Goal action as conduits for Goal achievement, underscoring the importance of implementing models which ensure good practice. Current corporate social responsibility (CSR) practice often pursues the triple bottom line (TBL). While the TBL presents an 'equation' of planetary and people-oriented measures to produce profit, it is unable to conceptualize these constraints within nationally or internationally mandated sustainable measures, such as the SDGs. Instead, it perpetuates a system that emphasizes action which directly translates into economic gain and parallels traditional growth targets. Kate Raworth's (2017) 'doughnut economics' model, however, represents a reconfiguration of economic focus by pursuing fiscal growth that is founded on social wellbeing and bound by the ecological ceiling of environmental resources. This model provides a clear theoretical delineation which can pin production within sustainable social and environmental parameters.

Limited research has focused on the the application of doughnut economics on business

performance and has elucidated the connection between CSR and the doughnut economic model. However, there is a current gap in research which investigates the connection between the doughnut economic model on business production in terms of SDG targets, indicators and achievement. As such, this presentation aims to contrast the utility of the CSR framework against the doughnut economic model in the ability to integrate SDG progress and measures in company practices.

By analyzing Australian company CSR reports and reporting standards, this presentation will apply Raworth's (2017) doughnut economic principles to extend current CSR practices. The application of the doughnut economic model can provide direction for good practices of social, environmental and economic company reporting which contributes to the achievement of Goal 12, whilst creating interlinkages with subsequent Goals. Therefore, this presentation exemplifies how company integration of the doughnut economic model can contribute to capacity building for good practices in reporting and achieving responsible consumption and production.

## Sustainability: How Do We Save Business?

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### **Abstract:**

Human capacity to inhabit, manage and modify the environment in which we live, that is, the planet, has, after years, triggered discussions about the conciliation between the human existence and the lived environment. The dialogue resulting from this interaction aims to find socially desirable results, as well as avoiding gross mistakes made throughout history, in order to conciliate development and the environment. In this sense, Public Governments and business activity have an interdependent relationship. While the first one holds the punitive and regulatory power, the second has the economic bias. The achievement of the global Sustainability goal implies the conciliation of these actors for joint policies. In this point of view, our article aims to demonstrate the participation of the business sector to achieve this objective, through socio-environmental management - with the organization or business financially viable, fair to the Company and endowed with environmental responsibility. To do so, the relationship between human being and the environment is first analyzed in order to identify the consequences of human performance over time. Subsequently, the application of Sustainability as a concept to the application of management policies for the business sector is examined, considering the awareness developed about the existence of a Risk Society, as well as the possibility of benefits arising from this management model. At the end, examples of Companies that have become Eco-efficient by applying sustainable guidelines – combining environmental goals and profitability – are mentioned and described. It is noted that attention

to the requirements imposed by a Sustainable vision, especially in its environmental aspect, does not only subsist as an ethical justification, around a concern with human well-being, but precisely becomes a condition for the survival of the company in the business game. The ideology of economic and business progress always understood as a measure of infinite growth has already proved to be a failed way of life. The 21st century demands other economic criteria in order to ensure this interdependence between human and non-human in a harmonious way. It does not mean that we need to adopt an “economic zero mark”, but to identify how it is possible to generate profit without destroying the world around us. For this reason, the expression “ecological completeness” becomes a key part of this understanding. The method used was inductive.

## A Thermodynamic Theory for the Circular Economy

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**Abstract:**

This is a thermodynamic theory of the Circular Economy that views the product supply chain through an entropic lens. The second law of thermodynamics provides a theoretical and mathematical basis for modeling the transition from a frontier economy driven by the exploitation of natural resources, to a spaceship economy driven by renewable energy that minimizes material exchanges with the natural environment. While all economic (and environmental) processes produce entropy (at the expense of exergy), this poster explores the mathematical analog between entropy and information. As materials are used, comingled, wasted, and disposed of thermodynamic analysis can determine those material and energy transformations that are the result of mixing (rather than reaction), and identify those leverage points in material flow streams that are suitable for intervention by applying information technology (IT) to mitigate exergetic losses. Unprecedented advances in sensors, sorting, and assessment technologies may make circularity an affordable prospect, should a thermodynamic theory of the circular economy prove to be useful for identifying high-quality opportunities first. This poster shows how information theory can be used to identify those thermodynamic barriers to the closed loop economy, with examples in light-metal alloy recycling with the potential to increase the value of current recycling streams by a factor of 3 or 4.

The evolution of thinking about entropy has progressed from Clausius (who defined it in terms of heat), to Boltzmann (who was first to define it in terms of statistics), to Shannon (who defined it using Boltzmann's mathematics but applied it to information), to what we're calling knowledge. For example, when we know the bill of materials, or the use history of a product, or location, that might help us identify the right circular strategy for it. Information is not the



same as knowledge, whereas Shannonian information is a change in probability assignment, knowledge is information in context.

When viewing the supply chain from an entropy lens, we can understand the knowledge gained or lost. When we recycle, we capture only the knowledge value of the materials. When we remanufacture, we might capture the knowledge value of the components. When we reuse, we might capture the knowledge value of the whole product system. When we dispose, all of the knowledge (materials, components, and product system) is lost.

The entropic theory of a Circular Economy helped us understand that there are two reasons to go circular:

1. To avoid environmental impacts of disposal, and
2. To retain the value (i.e., knowledge) of the used good.

## Supply chain partnerships to secure Leather Bracelet Industry

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### **Abstract:**

The most important watch bracelet manufacturers (representing 70 % of the luxury watches production) have realised that they can only fulfil their sustainable responsibilities with joined forces. For these challenges, they have founded AQC.

AQC is a Swiss-based international non-profit association initiated to facilitate the traceability and the compliance of materials used in the manufacturing of Leather Bracelets for the Watch Industry in the frame of the SDGs and sustainability improvement.

The vision of AQC is to ensure a leather watch bracelet with the highest level of safety with a responsible global supply chain that promotes confidence, security, and traceability in the luxury leather bracelet Industry.

Bracelet Manufacturers not only finance together all topics regarding the security of the environment, production safety, animal welfare, product safety, and consumer safety, but they also make sure laws and specifications are respected and solutions are developed for improvement at points where these are necessary.

Challenges were high: leather is one of the most sensitive material because of the animal origin and lack of transparency in the supply chain. The tanning process is one of the most critical chemical processes that need to be secured, manufacturing also requests chemicals with



possible impacts on the environment and workers that have to be appropriately monitored. Moreover, since the watch bracelet is also in permanent contact with the human skin, allergy risks are existent and should be duly avoided.

AQC has involved all concerned supply chain players to develop standards in order to respect CSR requirements such as Human rights, environment protection (included animal welfare best practices), health and safety at work, waste and emission evaluations and to perform chemical assessments. The standard definition starts with existing and harmonized practices to be then evaluated and improved step by step to put all stakeholders at a higher level of sustainability with stricter requirements. Audits and tests have been put in place to secure the process by independent third-parties.

Now AQC is technically able to communicate on the safety of the product to the consumer. A Label is in place and covers more than 50% of the AQC Members production. Next steps in 2019 will be the implementation of a traceability platform that facilitates the communication between all stakeholders in the supply chain with a Blockchain oriented solution to secure and assess the traceability flows.

What has been developed for the leather bracelet industry is a perfect example of cooperation between stakeholders and competitors in a win-win strategy. The methodology used for this supply chain could be implemented in other sectors with the same approach: status, harmonization, standardization.

At least it shows that possible solutions also exist for topics that are not easy to communicate to final customers, evermore for luxury goods production such as chemical compliance, traceability, animal welfare.

**Education and Research & Development in Sustainable Chemistry are a key element on the way to a Sustainable Society**

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**Abstract:**

A sustainable society relies on the use of materials as single use (e.g. disposables), middle use (e.g. cars) and long use (e.g. construction materials) in every action that we take. These materials are made from resources and with the help of a lot of energy. Most of the industries producing materials are among the largest industrial CO<sub>2</sub>-emitting and energy consuming industries as there are chemistry, refining, steel, minerals, non-ferrous, cement, engineering, etc. The chemical and refining industry is quite central in this panoply of large industries and can therefore be taken as an example for the strategy to move to a more sustainable society. The Antwerp University is in the center of the so-called Antwerp-Rotterdam-Rhine-Ruhr Area, the largest chemical cluster in the world giving the university a large responsibility in the education of its future chemists and engineers and in its research & development towards more sustainable materials and processes. The university and RTO have a crucial role in the integration of governmental regulations and industrial sustainable development in agreement with climate change mitigation, the circular economy and competitiveness.

Indeed via public-private-partnerships and cluster activities authorities work together with academics and industries as well at the level of Regions (e.g. Flanders) via Catalisti as at the European level via SUSCHEM (sustainable chemistry of the European Chemical Association). On top of that sustainable processing is not anymore only a case of one industrial sector. It is a combination of energy and resources supply, water and waste treatment, emission control, and value chain working (from feedstock to final product). In this way also a public-private-partnership SPIRE (Sustainable Process Industry through Resource and Energy Efficiency) combines the higher mentioned industrial sectors in a strategic road map thinking together with the European Commission in order to pave the way to a sustainable European production by implementation and applied research to solve technical hurdles in order to reach the final climate goals set by the EC toward 2050.

In order to get there the chemical industry focuses on the use of renewable resources (biomass, CO<sub>2</sub>, waste, ...) and renewable energy (e.g. more focus on electrification). Also auxiliaries as water, solvents and catalysts need to be recycled among the process. On top of it creating new processes via process intensification can make a big change. Also the production of new more performing, safer and climate friendly products and materials of the future needs (e.g. insulation, lightweight composites, energy storage, 3D-printing feedstock, etc.) can have a large impact.

The lecture will explain how the strategy was realized in combination with PPPs and several cases of successful results will be demonstrated as example to trigger others to follow the lead of the European Sustainable Chemical industry relying on climate improvement, circular economy and competitiveness.

## Pakistan National Action Plan (NAP) a Policy Framework on SDG 12 (Sustainable Consumption and Production): An Indigenous Approach of Implementation

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### **Abstract:**

Pakistan resource efficiently is among the lowest in Asia. Pakistan has developed its Environmental Protection Act to pursue sustainable development agenda, which remained unimplemented. Sustainable consumption and production is crucially relevant for Pakistan given the massive degradation and depletion of natural resources due to the population explosion – from 32 million in 1947 to over 185 million in 2010 – and agricultural and industrial development pursued without regard for environmental sustainability. Per capita, fresh water availability has declined from over 5,000 cubic meters in the 1950s to less than 1,000cm in 2010. Therefore, the quality of drinking water has deteriorated in most cities and towns, leading to a huge increase in water-borne diseases. If that wasn't enough, the majority of rivers, lakes and ponds are heavily polluted and industrial, municipal and household waste continues to be dumped in water courses. Because of the decaying water infrastructure, there is a 40pc water loss in conveyance from dams to farms, which is seriously challenging for agricultural development. To add, industrial, agricultural and household chemicals are freely imported and used without any regulatory system. Then, forest cover has dwindled from 5pc to around 3pc. Massive depletion of natural resources has meant the cutting of trees, resulting in increased timber imports for housing, furniture production and other usage. Consequently, health and productivity are impacted because of the lack of sustainability.

It further required lot of strategies for its implementation. Lately Pakistan National Action Plan (NPA) was developed in May 2017 to achieve the sustainable Goal particularly Goal 12. This goal is about Sustainable Consumption and Production (SCP).

This was developed after extensive input and deliberations of all stakeholders. It marks the culmination of national and provincial level multi-stakeholders consultation process launched by the Government of Pakistan, Ministry of Climate Change in collaboration with the EU SWITCH-Asia Policy Support Program as well as UN Environment agency and devilment program.

Moreover, a unanimous resolution by Pakistan constitutes Assembly on 19th February 2016 and a history is made that Pakistan become the first country in the world that adopted Agenda 2030 for Sustainable Development as its own national development agenda.

This epochal decision, attaches special significance to the NAP-SCP as it lays foundation of the roadmap for achieving its sustainable development goals. In August, the government facilitated and actively contributed to an UN-sponsored round-table on SCP, as a means of ensuring

“efficient, appropriate and affordable use of our natural resources.

This paper would like to present the development of the key strategic actions towards attaining SDG 12 for indigenous approach of implementation for instance establishment of climate resilient infrastructure; optimal exploitation of indigenous renewable energy resources, cut waste full losses through investment in transmission and distribution infrastructure; introduction of farm and crop management techniques, increasing storage facilities and on farm residue management, eco-labeling of agricultural products; promote smart cities, prevent urban encroachments on fertile agricultural and forest lands, provide affordable housing, integrated waste management program; introduction of market tools to promote value chains of transport management; integrated water resource management, recycling and re-use of industrial and domestic wastewater; promotion of sustainable forest and land management; technology parks, incubators and cleaner production centers; provide quality and affordable education and establish linkages between universities and industries and how much it has been humanized of the country 2025 vision of development.

This paper would also discuss in length the legislative and regulatory steps including in mainstream SCP in national sectoral policies, strategies and planning and capacity for sustainable governance.

## Sustainability in buildings: an overlook in a city in southern Brazil

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### **Abstract:**

Sustainability is a theme that has been much discussed in recent decades. In the field of civil construction, sustainable buildings have emerged with the aim minimizing consumption of natural resources and decreasing environmental impacts. In order to attest that these buildings meet sustainability standards, environmental certifications have been created. In the city of Florianópolis, there is a small number of LEED- or AQUA-certified buildings, the two most commonly used certifications in Brazil. Thus, the objective of this work was to find out the sustainability strategies that have been implemented by builders in residential and commercial non-certified buildings in Florianópolis. The work was carried out by means of exploratory analysis and questionnaires. First, the websites of selected builders were accessed in order to check the sustainability strategies they have been applying in their real estate developments. Then, questionnaires were applied directly to the builders with the purpose of obtaining more data about what strategies are actually implemented. The exploratory analysis showed that few

sustainability strategies have been used, but they have been used more often in residential buildings. Strategies related to water savings are the most used due to the ease of implantation and the greater perception of users. When comparing the results, it was observed that some of the sustainability strategies that are implemented are not publicized. The main conclusion is that the implementation of sustainability strategies in buildings in Florianópolis is growing, but remains low and, even so, the publicizing of such strategies is poor.

## Assessment of Potential Human Health Consequences Associated with Processing and Handling of Switchgrass Biomass for Bio-Based Products

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**Abstract:**

In an expanding, regenerative bio-based economy, the role of cheap, low impact lignocellulosic switchgrass (*Panicum virgatum* L.) biomass is that of a steady energy source, as we make the transition from fossil fuels to wind and solar power. Perennial bioenergy crops such as switchgrass can grow efficiently on marginal and degraded land with very low nutrient and water demand. However epidemiological studies have linked worker exposure to high concentrations of bioaerosols when handling and processing biomass in a biofuel plant. Toxicological studies have also found bioaerosols exposures to have inflammatory, respiratory, and pathogenic effects on worker health. In this study, we collaborated with a switchgrass processing facility that manufactures a variety of pelletized and non-pelletized biomass adsorption products. These products are currently being used for livestock bedding and, other valued added industrial adsorbents. The primary aim of this study was to quantify personal and

environmental exposure of workers to dust, endotoxins and bioaerosol present during handling and processing of switchgrass biomass, and to describe airborne fungal and bacterial communities associated with their daily activity. For the purpose of this study, a total of 111 airborne dust samples were collected using a stationary 37-mm open face cassette across the processing facility. Similarly, 27 stationary respirable and 15 personal exposure dust samples were also collected using an aluminum cyclone. Collected samples were quantified for dust concentration using gravimetric analysis. Captured endotoxins were analyzed using *Limulus* amoebocyte lysate, while total bioaerosols were enumerated using a modified CAMENA method, and airborne microbial communities were identified using sequencing a portion of the bacterial 16S rRNA gene and fungal ITS region. The environmental exposure levels to fungi (median =  $118 \times 10^4$  cfu/m<sup>3</sup>), bacteria (median =  $29 \times 10^6$  cfu/m<sup>3</sup>), endotoxin (median =  $2.6 \times 10^4$  EU/m<sup>3</sup>) and, organic dust (median = 8 mg/m<sup>3</sup>) were in general high across the processing facility. In Netherlands, an occupational exposure limit (OEL) for total organic dust is strictly enforced at 5 mg/m<sup>3</sup>, and it is recommended to the industry by the Dutch health council to observe a health-based OEL of 90 EU/m<sup>3</sup> for airborne endotoxins. In our case study the environmental concentrations for both airborne organic dust and endotoxins exceeded these occupational exposure limits. Given the current emphasis on bio-refining, bioenergy and biomass as being of crucial economic importance in attaining the sustainable development goals, it will be important that these industries protect workers. Our data indicates that the health impacts to workers in this industry are of concern and should be monitored, and that countries without OELs should consider adopting them to ensure worker health and safety and thus sustainability.

## On the Path of Zero Carbon: A Case Study of Dubai Police Energy Conservation Practices

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## **Abstract:**

### Introduction

Coupled with the UAE's current profile of having one of the highest carbon footprints per capita, and Dubai's consequent march towards becoming the world lowest carbon footprint city by 2050, Dubai Police's objectives and strategies have expanded to face challenges related to climate change mitigation. As the world's first carbon neutral police force, the initiative has supported in promoting environmental education and awareness, addressing the limited resources encountered, and building strong community engagement practices to reduce carbon emissions.

Dubai Police was established in 1956 with only one building to run its operations. Today, the force owns over 400 buildings and manages more than 3000 vehicles of its fleet to run its operations. With the growing demands of the Emirate of Dubai and the expected increase in population size over the years, the organization's growth must go hand-in-hand with the city's growth to ensure high quality of safety and security services are provided.

### Methodology

In its aim to be a carbon neutral police by 2020, Dubai Police measures its climate footprint using an Operational Control Approach that identifies the sources of Greenhouse Gases (GHG) emissions and accounts GHG emissions in line with ISO14064-1, and other international GHG protocols. A Measurement, Reporting and Verification framework was developed to ensure standardization of GHG accounting within Dubai Police. The 2020 target commits Dubai Police to 30% emission reduction from business as usual scenario through effective measures including consumers' behavioral change, green procurement, adoption of efficient building energy practice in existing operations, and designing future operations with zero carbon specifications.

A network of representatives within Dubai Police, the carbon champions, were appointed to drive the initiative from inception, ensuring that the initiative runs through every aspect of the organization's work and creating a strong linkage between the core duties and the activities to achieve carbon neutrality. To achieve the former, the carbon champions joined practical and theoretical capacity building programs that equip them with the tools to drive the initiative successfully.

The designed approach of the zero carbon project is tailor-made to Dubai Police but can also be scaled up as a best practice to other larger sector organizations such as civil servant bodies. The initiative was set up to meet local, national and global climate change directives and the methodology follows standards that can be accustomed to any organization regardless of its size, operations or geographical location. The targets used allow for flexibility within the first years of implementation, as it considers the challenges encountered and the learning curve in the first stages of implementation. The success of replicating the initiative stems from the basic foundational principles that considers the principles of relevancy, completeness, consistency,

transparency and accuracy. With a solid foundation in place, the initiative can be tailor-made to suit any environment and sectors across the world.

## Results

Energy efficiency measures have reduced electricity-water bills in buildings by 22.5%, and fleet fuel consumption by 19.6%, leading to a total of USD 10 millions in savings and over 15,000 tons of carbon emissions reductions from 2014 to date. Beyond Dubai Police operations, an estimated 120,000 tons of carbon emissions were avoided in two years record due to smart transformation which have reduced the number of customers' trips to the service centers.

## Steps Forward

With achievements in operational efficiency, Dubai Police is now transitioning towards clean energy production with future plans to cover the 400+ Dubai Police building rooftops with solar panels. The customer services centers are also transitioning to smart police stations, offering all public policing services with zero paper consumption and human interactions, and automated services that produce the lowest emissions possible. The strategy further targets to pursue carbon offsetting in 2020, after ensuring that all efficient measures are fully implemented until emissions cannot be further reduced.

## Sustainability

The initiative proves to be powerful tool to build capacity and empower different community members to reduce carbon emissions through a city-wide approach. The benefits cover the three pillars of sustainability, with reductions in GHG emissions and long-term running costs and increased social awareness.

## CareBag: a concrete example of circular economy and sustainable production

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### **Abstract:**

CareBag is a green line of products consisting in assembly kits of eco sustainable bags, and assembled bags. The main features of CareBag are:



- Green Product: high quality, 100% eco sustainable and natural.
- Do it yourself: simple and fun product to assemble.
- Customization: alternative assembly paths, and creation of customized accessories.
- Educational value: a small booklet will be provided, with a strong scientific basis that will show the environmental advantages of the kit.

The circular economy and the blue economy are the foundations on which this project is based, closely related to the concept of sustainable development, based on the idea of an economic system designed to be able to regenerate on its own, and on the creation of an eco-sustainable production system that transforms or reuses substances previously wasted on goods and products of economic value.

The CareBag project is perfectly in line with this systemic approach. In fact, materials generally considered waste were chosen: wool, as the main material of the bag, olive wood coming from pruning residues and plexiglass waste from industries, which is the material with which the buttons and other parts of the bag were made. Wool has now become a mainly waste product. Except for the fine breeds, and for use as an insulating material for the building sector, it is often even a burden for breeders, having its own disposal cost.

This project is the accomplishment of a "multi skill concept", a production process where the capabilities and contributions of all actors in the supply chain (designers, makers, web community, customers) are put together to arrive at the final product. The product is complete and assumes its final configuration thanks to the final customer, who can customize it; he knows that his product is a unique piece, because is not the result of an industrialized process, but of a self-production. A short chain, made in Italy, but which reaches every corner of the planet. It brings with it not only the product, but a message with a high educational value, on the feasibility of a different model of economy, and its positive impact on the economic, social and environmental system.

In this context, the project's environmental assessment was included. In particular, the products used were considered in a life cycle analysis perspective, according to the method of the Life Cycle Assessment (LCA). The results of the analysis showed, per kg of material produced, a reduction in impact of almost 5% for several impact categories, examined through the Ecoindicator 99 method (Goedkoop, Spriensma, 2001), in particular for the categories:

- "climate change" (climate change, linked to emissions of greenhouse gases into the atmosphere),
- "ozone layer" (ozone hole),

- "respiratory organics" (emissions of organic substances into the atmosphere),
- "radiation" (radioactive substances),
- "ecotoxicity" (toxic substances for aquatic and terrestrial systems).

Furthermore, there has been a reduction of almost 15% in the consumption of fossil fuels ("fossil fuels" category).

## Responsible consumption and production: using behavior change models to tackle food waste

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### **Abstract:**

Each year, approximately 1.3 billion tonnes of edible food produced for human consumption is wasted globally (Russell et al., 2017; Schanes et al., 2018). 'Food waste' refers to the loss of edible produce in different stages of the food supply chain (Stancu et al., 2016). Studies show that food waste is significantly concentrated at the household level (Setti et al., 2018). In Australia alone, household waste amounts to about 3.1 million tonnes of edible food per year (Kelton, 2019). Throwing away food intensifies environmental burden, as it contributes significantly to greenhouse gas emissions such as methane (Russell, et al., 2017). Similarly, food waste has financial impacts as it uses substantial quantities of resources like water, arable land, fertilizers and fossil fuels from its production to consumption. It is resource intensive and expensive (Stancu et al., 2016). Hence, the drive to reduce food waste is further emphasized by Sustainable Development Goal (SDG) 12, which promises to ensure responsible consumption and production patterns (Commonwealth of Australia [CoA], 2017). Thus, individual behavior associated with rising food waste must be taken into consideration.

In this regard, the Australian Government designed the National Food Waste Strategy in accordance to SDG 12 to reduce food waste (Department of Environment and Energy [DEE], 2017). Nevertheless, while knowledge motivates people to change their attitudes on certain issues, it does not guarantee their intention to change behavior (Government Communication Network [GCN], 2009). Behavior change theorists posit that personal factors like having knowledge of an existing problem or a positive attitude towards waste prevention does little to encourage behavior change (Schanes et al., 2017). Thus, this paper suggests using behavioral models like the Theory of Planned Behavior (TPB) to examine and tackle food waste behavior among consumers at a household level (Ajzen, 1991). This paper will try to unpack how behavioral models can be used to stimulate favorable attitudes towards behavior change (Graham-Rowe et al., 2014). For example, the TPB framework suggests that for an individual to perform a certain behavior, intention is a key factor, which is further influenced by attitudes, social norms and perceived behavioral control (Ajzen, 1991). On the other hand, the paper will

try to explain how factors beyond an individual's control influences their ability to make rational decisions when purchasing food items (Quested et al., 2013).

## Using Microalgae to Trap CO<sub>2</sub> in Cement Production Process

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### **Abstract:**

Autotrophic microalgae are photosynthetic organisms that undergo the conversion of light into chemical energy as a form of organic compounds through their photosynthetic machinery. The cultivation of microalgae brings environmental advantages, bearing in mind the capability of nutrient recycling in waste waters together with the fixation of greenhouse gases such as CO<sub>2</sub>. [1]

Microalgae are microscopic organisms that typically grow suspended in water and are driven by the same photosynthetic process as that of higher plants (Hanelt et al., 2007). Microalgae can include bacteria (cyanobacteria), diatoms (e.g., Chromalveolata), other protists (e.g., Chromista), and unicellular plants (e.g., Chlorophyta) (Bahadar and Khan, 2013). However, unlike higher plants, microalgae do not require a vascular system for nutrient transport, as every cell is photoautotrophic, directly absorbing nutrients. Microalgal cells are sunlight-driven cell factories that can convert carbon dioxide (CO<sub>2</sub>) into raw materials for producing biofuels (e.g., biohydrogen, biodiesel, and bioethanol),

animal food chemical feedstocks and high-value bioactive compounds (e.g., Docosahexaenoic acid (DHA)) (Spolaore et al., 2006; Milledge, 2011; Razzak et al., 2013). In particular, the ability of these cells to absorb CO<sub>2</sub> suggests microalgae cultivation as an attractive alternative for CO<sub>2</sub> sequestration that can be applied to fossil fuel power plant gas effluents to facilitate the reduction of greenhouse gas emissions (Yun et al., 1997). [2]

Sabancı Cement Group, as the leading cement producer of Turkey, has adopted a sustainability approach that includes decreasing greenhouse gas emissions. Carbon dioxide (CO<sub>2</sub>) is the most important greenhouse gas that causes global climate change. The Use of Microalgae as CO<sub>2</sub> Trap in Cement Production Process project is one of the sustainability projects carried out by the Akçansa Çanakkale Plant<sup>1</sup>. The aim of the project is to reduce the amount of CO<sub>2</sub> released from the flue gas of the Akçansa Çanakkale Plant<sup>1</sup>. For this purpose, photosynthetic microscopic living microalgae have been used. With the reduction of CO<sub>2</sub> emissions, microalgae production costs were reduced and an important oil source was produced. CO<sub>2</sub>, NO<sub>x</sub> compounds and trace elements such as iron, zinc and copper are important nutrients for

photosynthetic life. Microfiber culture systems help to reduce microalgae production costs by performing integrated production with these types of products and providing the optimum temperature for microalgae throughout the year. Three different culture systems (panels, tubes and open ponds) were tested in parallel. Outdoor ponds have the advantages of being both easy to operate and cheaper to install. The growth of microalgae was investigated in 3 different (5, 10 and 20 cm) width panels. Photobioreactor tubes with a diameter of 5 cm were also used. CO<sub>2</sub> in the flue gas was supplied to the systems via a diffuser. The flow rate of the flue gas from each branch in the ponds was approximately 10 liters / min, and in the panel and tube bioreactors 0.6 liters / min. This difference in flow velocities is related to the culture of the biomass.

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## Corporate Social Responsibility in the Oil and Gas Industry: a study case

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#### Abstract:

Corporate social responsibility (CSR) is a widely known term nowadays but, what is really CSR? There is not a clear and concise definition of CSR. Therefore first in this paper we explore some of the different existing classifications and the consequences of this lack of a precise definition of CSR. This multiplicity of interpretations creates hundreds of rankings attending different criteria so that almost all of the companies are on the top of one of these CSR rankings. This leads to a lack of transparency when trying to judge whether the CSR politics of a company are the right ones or not.

Then, using the CSRHub database, the biggest oil companies are examined and compared between each other considering four dimensions: social, labor, environmental and corporate government. This gives us an overview of CSR in the oil and gas industry. After that, we analyze the biggest three oil companies in The United States: Chevron, ExxonMobil and ConocoPhillips. We look at their history, their common origin and we study their CSR reports considering again the four dimensions aforementioned. Finally, the case study: we explain one particular case in which these oil companies do not do what they say they do in their CSR reports. The three

cases are: the contamination for more than thirty years of the Ecuadorian forest done by Chevron, the continuous violations of Human Rights including torture, rape and forced disappearances at the premises of ExxonMobil in Aceh, (Indonesia) and the use of "fracking" by ConocoPhillips in Colombia despite the danger and consequences of that technique in the country. With all this, we can conclude that just writing huge CSR reports is not enough and these reports do not guarantee a correct behavior on the part of big companies.

Sometimes, transnational companies use their CSR strategies in order to justify their actions in the countries they operate and when those actions are denounced, they enjoy impunity. This is why we defend that governments should legislate globally; there should be international rules transferable between all the countries. These rules should be also mandatory and the companies should face consequences if they do not comply with them. Thus, the situations we explore in this paper would not exist and there would be no such differences between the home country of the company and the countries they operate in.

However, it is important to remark that CSR has an important role in the business world and it has a great potential for the most vulnerable communities who can benefit from it. The key is to achieve a real corporate social responsibility and that is not used for different purposes.

## Consumption and production redefined

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### **Abstract:**

#### Introduction

The United Nations as a Global Governance wing shoulders immense responsibility to "understand" things that matter cutting- edge.

Volumes of quality effort has been pumped- in to develop a model of " understanding" to manage global crises and this " understanding " base is evolving with no hope of a " perfect" solution at hand.

Unless there is a fundamental change with which we operate inside and outside the paradigm is initiated and worked upon the real " disease" cannot be addressed.

While the UN came in as the post world war peace dispensing model, notwithstanding its "achievements" it still needs to go a long way to keep " pace" with the ever increasing need for " solutions".

This may be a defining moment if the UN is taking total 360 degrees cognizance of the need to strike at the root of faulty understandings in terms of policies and systems.

Though the space offered by this research paper is too miniscule to throw light on the "big picture" the effort would consider it an opportunity to highlight what it means to be "responsible" especially towards two of the most defining activities- consumption and production.

### Consumption and Production redefined

When connected to a "sustainable" big picture micro level consumption pattern should be thoroughly choreographed in terms of per person needs. To put it simply the absolute well being of an economic unit cannot be so complicated. This truth is more than understood by any simple system without the expertise of economists and other social tools of intelligentsia. Poverty is an artificial "creation" of the "inbetween" "logistics" system. By logistics it not only means the physical transportation of the "service" but also the different pockets of "decision making" units this service has to pass. "How" the input is understood is too complicated in terms of multiple systems. Before the service can be routed to its destination it has to cross over corrupted "black boxes" which has earned a permanent place within the system.

The paper would attempt to identify and throw light on how to de-clutter choked systems in terms of consumption. An attempt will be made to define "consumption" in a simple light.

Production has been a mainstream activity since time immemorial. To bring into existence a product or service which would address the need is termed as production. Simple and simplicity based intelligentsia would agree to the fact that consumption and production should match. The equilibrium is what we call as "peace". This simple equilibrium is hard to achieve and is symptomatic in the poverty stricken continents. Poverty then should not be a by product of lack of production. Now there is a compulsion to understand "production" in a different light. With such "technological" growth if poverty still continues to be an overpowering malady - then it is an "understanding" flaw.

The paper would also throw light on "production" and simple systems to achieve responsible production. When we say "responsible" production then the question arises "responsible" for whom and for what and why. The paper would also throw light on the three aspects of "responsible" production- the what, why and whom- the three W's.

Resources are not scarce for Global Governance organisations and the needed "know-how" to dispense the resources are also not dreary. So any neutral, discerning system can understand that "systems" complicate peace models. Consumption and production, as all existing patterns, should be thoroughly redefined in the light of simplicity and models should be tuned to achieve the ends.

Effort will be made within the scope of the paper to understand the Production, Consumption

model in a new and different light which would serve as an eye-opener for policy makers thriving to achieve the MDG's and the Sustainable Development Goals.

Cutting- simple models have been long ignored for want of "discerning" systems and the paper will by using its limited scope "pull the wool" of the eyes of such systems by clearly putting forth the model with all its dimensions.

## Sustainability Reporting Leads to Responsible Consumption and Production

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### **Abstract:**

In order for business to make social and environmental sustainability a priority, regulation needs to be brought in to make sustainability reporting a requirement.

Business operates in targets and measures. Progress is never going to be achieved without objectives that can be measured. Objectives can be re-evaluated and improved upon to ensure ongoing advancement. At the moment in most countries, profit is the priority and targets are made to measure it very carefully. Thus every level of an organisation works towards advancing and finding ways to improve their profit over improving other options.

These goals should include not only the financial information but the social and environmental "income" and "costs" a firm has to the planet and society. Furthermore, all negative externalities can be captured by these sustainability reports. Negative externalities are never captured in standard financial reporting all businesses do. It is important to capture negative externalities to ensure businesses are always focusing on the costs to third parties.

When organizations have to report on the positive and negative environmental and social effects they have, they then become more aware at a production level what actions and materials have more impacts. This then leads to choosing more sustainable materials and ensuring that people in their supply chains are paid a fair wage and have safe working conditions. Therefore, businesses will choose actions and materials that will have less impacts and less "costs" on the environment or social section of the report. Thus production becomes more responsible and sustainable.

Additionally, Corporate social responsibility is encouraged in this system because firms can report this as an "income" on their reports and this can be celebrated. Consumers can then become more aware of the good work organisations are doing.

As the sustainability reports can be made public and consumers can understand and see what businesses align with their expectations and spend their money and power there. Furthermore, consumers can understand how sustainable and ethical products and companies are and hopefully consumers can choose more sustainable options. Therefore consumption can become more sustainable and responsible.

When production and consumption become more responsible, economic growth can occur socially and environmentally sustainably.

## Socially Responsible Financial Services for Migrant Workers in Korea: the Case of Sentbe's Digital Remittance Service

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### **Abstract:**

SDGs and remittance

Remittance can effectively improve the living standards of migrants, their families and communities back home. The United Nations and many scholars emphasize that remittance is, directly or indirectly, connected to SDG 1 (poverty eradication), SDG 2 (zero hunger), SDG 3 (quality health), SDG 4 (education for all), SDG 5 (gender equality), SDG 8 (job creation and employment), SDG 10 (equal society), SDG 16 (peace and security), and SDG 17 (partnerships).

### Significance of remittance for low-income economies

According to the recent data of the World Bank in April 2019, Korea is the 10th largest remittance sending country: its outward migrant remittance flows amounts to 12,888 million USD as of 2017. Its major destination countries are concentrated in Southeast Asia as well as in South Asia. In most of these countries, remittances are not only a bigger overall figure but also more persistent, compared to FDI or ODA. In the case of Nepal, one of the least developed countries in the world, its remittance in 2017 was equivalent to 27.8% of its GDP. Meanwhile, a study found that 81% of Nepali workers in Korea relied on informal channels to send money to home despite the high risk. Given such a situation, its remittance ratio to GDP would be higher.

### Long-lasting problems in the Korean remittance market

Remittance service is a common financial service in many countries. The case of the Korean remittance market has, however, a distinctive background. The Korean Foreign Currency Exchange Law had allowed only banks to provide remittance service for over 50 years until the law began to permit non-bank financial service providers to enter the market in 2016.



Consequently, banks enjoyed its dominant position without making more cost-efficient remittance product and better service for clients. According to the World Bank, when sending 200 USD to China or Vietnam from Korea, the average total cost of remittance by major Korean banks and global MTOs was 9.27% in 2011 and 6.88% in 2018. In addition to the expensive cost, remittance clients in Korea have largely felt that sending money abroad is difficult and slow. Such pain points have been, for migrants who account for the majority of remitters in Korea, more than an inconvenience: they rather choose to use illegal cross-border money sending channels despite its assumed high risks.

#### Sentbe's digital remittance service and its impact

Sentbe, a socially responsible non-bank financial service provider, is challenging the conventional financial system landscape by providing migrants who have long been neglected in it. Traditional remittance methods are expensive, limited, inconvenient and slow. To address these pain points, Sentbe reduced the cost of remittance to 1.2% of the total remitted amount while the remittance cost of banks remains at 9% in practice. Its cost is far less than the SDG 10 target aimed at reducing to less than 3% the remittance costs and eliminating remittance corridors with costs higher than 5% by 2030. As a result, it is estimated that Sentbe's end-customers have saved approximately 16 million USD, compared to when using banks' remittance services.

In addition, it differently segments customers by nationality, region, and lifestyle. Remittance request of migrants had to be done by a visit to banks: it is often concomitant with banks' limited opening hour from 10 am to 4 pm during the weekdays, a long waiting queue, and complex documents preparation. Sentbe essentially offers online remittance service to migrants, enabling them to request remittance anywhere at any time via mobile devices or PCs. Given its 62,000 users have 12 different nationalities. its online service pages are designed in 10 languages and its customer service staff have the same nationalities with customers. It also runs offline branches in 2 cities where migrants are the most populated in Korea and diversifies end-points upon the preference, convenience, and accessibility of receivers.

With respect to remittance processing time, its users can make remittance request within 20 seconds while banks' processing takes 3 to 5 days, thereby enabling beneficiaries to receive funds 5 minutes after the request.

## SDG Partnerships and Whole-of-Society Engagement

### Sustainable development goals and tourism in Nigeria

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**Abstract:**

Sustainable development goals and tourism in Nigeria using Old Oyo National Park tourism activities to examine the crucial role and significance of sustainable development goals and tourism in Nigeria for Nigeria's development effort. The instrument used in the study was a questionnaire of 28 research questions. The responses to each item were analyzed using simple percentages, mean and the hypothesis was tested using chi-square statistical tool. Using the degree of freedom of 3 at 0.05% level of significance, the results showed that, tabulated value is 7.82, calculated  $\chi^2$  (4773.99) is greater than tabulated value. Therefore, null hypothesis which says that there is no positive relationship between Old Oyo National Park Developmental goals and the Economic Development of the area was rejected and we conclude that Old Oyo National Park tourism development goals in the study Area are positively related. It is hereby recommended that Nigeria government should support the integrity of local tourism activities by favouring businesses which conserve tourism's heritage and traditional values. By consciously supporting local economics by purchasing local goods among other things is capable of creating a suitable premise for sustainable tourism development. Next, is the suggestion to set up some relevant institutions and organisations to foster the development of tourism. Security is a vital component that gives the tourism industry the desired cover especially when considering the life of tourists. Security of tourist destination is the most critical responsibility of any nation that opens its borders to foreign tourists. Government should urgently tackle the problem of infrastructure development and maintenance.

Key Words: Tourism, Sustainable tourism, Goals

## From The Millennium Development Goals (MDGs) to the Sustainable Development Goals (SDGs): Another Joke?

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**Abstract:**

Purpose –There is growing interest among academics and policy makers about the role of the SDGs in bringing about sustainable economic growth and development among the poor in the world. Despite this, current studies on the topic have focused on how the West can help the poor in the world to meet the SDGs targets without critically assessing the failures of the MDGs and all the other development programmes before it. This paper therefore sought to answer the following questions: How relevant were the MDGs? What were the failures of the MDGs? How different are the SDGs from the MDGs? Are the SDGs not another talk show from the developed world?

Design/methodology/approach – A qualitative research approach was used for the study. Using secondary data sources, data collection was guided by aspects of the modernization theory and the analysis was conducted using content analysis techniques.

Findings – The result suggests that the SDGs identified are not targeted to specific groups and needs of communities. Again, these programmes are appears elitist with limited involvement from the majority of the citizens who constitute the majority population. The study concludes that the gaps in contextualizing the needs of the poor will dent the efforts the world is investing into the SDGs.

Research limitations/implications – Further studies will be needed to validate findings using the quantitative research method and primary primary data.

Key words: Millennium Development Goals (MDGS), Sustainable Development Goals (SDGS), Joke

## Empowering LSGs is the Key to Achieve SDGs: An Indian Perspective

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### **Abstract:**

From last three decades Millennium Development Goals (MDGs) has played a major role to bring right based approach to socio-economic development at the local, sub-national, national and international scenario. The multi-lateral and bi-lateral agencies tried their best to implement eight major goals to achieve the MDGs but could not succeed, as the then Secretary General Ban Ki-Moon observed, “The MDGs helped to lift more than one billion people out of extreme poverty, to make inroads against hunger, to enable more girls to attend school than ever before and to protect our planet.” He went on and added further “Yet for all the remarkable gains, I am keenly aware that inequalities persist and that progress has been uneven.” The ‘Sort of’ success as seen in the MDGs report 2015 draws a mark of confusion, of course, it is a difficult question to answer empirically, because the way of achieving a specified result on the effect and cause of these goals are difficult to discern, but still brings confident when it shows new rays with 17 new goals that is not that much difficult to attain if we implement it not from the top but from the bottom. The researchers McArthur and Krista Rasmussen have nicely discussed it in their research topic “Change of pace: Accelerations and advances during the Millennium Development Goal era.”

Whatever the reason and the result may be, as we are looking for a new growth with the

dashing goals and a new terminology of SDGs covering 17 important goals to make the world a better place to live. The empirical evidence suggesting the failure in the achievement of MDGs, is the reason, why, we should not avoid the faults we have committed during the implementation of the MDGs and correct them more effectively in an inclusive way with hi-tech initiatives by educating, empowering and inspiring all those who had been left behind during MDGs. The central point of SDGs is “No one should leave behind”. In other word our approach should be more inclusive governance by engaging local governments at village levels. During the implementation of MDGs, an observational research shows that MDGs become less successful as it could not reach to the public at the grassroots and it could not include the local government. Study shows that even district level administrators were unaware or ill informed about MDGs. Against the backdrop, the research article will attempt an evidence based implementation strategy from Indian perspective stating as how to indulge LSGs (Local Self-Governments), both in rural and urban India to bring exciting results in achieving the SDGs. Since the LSGs work under the sun-national governments in Indian federal system, it is important to study the environment States have created for the LSGs to function under. This includes devolution of functions, finances, functionaries and their capacity building including training and education which is key to implement aspects of SDGs. This will give a tremendous boost to achieve the Goals, as they can implement the objectives very nicely at the local level to see that SDGs are really achieved instead of keeping these goals in the files of top level administrators at central and state level who seem to be least concerned but confident to achieve these goals.

## Solutions for the world ocean

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### **Abstract:**

By presenting a study of the global mobilization toward plastic pollution in the world ocean, we highlight the vital role of whole-of-society approaches in bridging spaces and communities. Now that « closed societies are no longer an option » (Kaldor, 2008: 44), Whole-of-Society partnerships are key to addressing transnational problems and achieving the 17 SDGs. As an integral part of the 14th SDG, plastic pollution in the world ocean is a case that simultaneously attest dynamics of planetary interconnectedness and the necessity for beyond-borders cooperation.

To be answered, transnational issues require « unprecedented levels of cooperation » between transnational actors (Carter, 2007: 176) and we argue that academic research can support this process towards global cooperation. As many other transnational problems, environmental concerns call for the necessity to take each other into account and act in concert (Corry and Stevenson, 2017: 1). Hence, we must now move to « beyond nation-state frameworks of analysis » (Robinson, 1998: 578) to understand and act on the world. Accordingly, we suggest

that building adapted frameworks to support whole-of-society cooperation and cross-disciplinary discussion is essential.

On-the-ground initiatives are changing the world one step at the time while researches inform actual and future decisions and whole-of-society cooperation. To inhibit solutions for wide-scale concerns, we argue that ideas and norms are powerful determinant of reaching consensus. In fact, consensus building is one of the biggest challenges of Whole-of-Society approaches. Yet, it can be overcome by realizing the full potential of the world when united.

At the International Conference on Sustainable Development, we expect to bring light to the rich discussions on Whole-of-Society under the presidency of Dr. Aparajita Banerjee, Dr. David Horan, Dr. Edna Murphy, and Dr. Patrick Paul Walsh. Searching for pragmatic solutions and exploring new area of research will be central to our contributions. Whole-of-Society approaches have much to offer when it comes to addressing global problems. Key to our success are ideas and norms that bridge populations and foster common understandings. In our study of the world ocean, we highlight that the world society is emerging, and with it, many solutions to achieve the 17 SDGs.

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## Why we need to democratize space

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### **Abstract:**

Life on our ever-changing world faces many big challenges facing ever more people as the population of Earth expands. The Sustainable Development Goals have been identified and

embraced as a means of addressing major problems and improving life for everyone's benefit. Awareness of the Goals, and actions to achieve them, must reach beyond politicians to the whole of society. Acceptance and change must ultimately come from the people. Efforts to raise awareness of the challenges facing humanity must therefore be embraced.

Providing a global view of Earth from space, monitoring our world's major changes daily, accessible for free by everyone, will offer unique new perspectives of the challenges facing humanity and provide key infrastructure for a sustainable future.

Timely video from space has unique attributes of movement and story-telling power that can change the outcome of both rapidly evolving disasters and of the bigger picture of our future. Video of Earth from space can raise awareness and change how people feel and act. A new media that democratizes space is necessary to ensure these unique video perspectives are accessible—and benefit—all humanity.

Key structure of speech

Our ever-changing world.

The human world changes every day through the actions of a growing population.

The natural world changes every day.

The interaction of these worlds, ensures life on Earth is constantly changing.

On a planetary scale, we face many big challenges, well defined by the SDGs.

Ever more people must face these big challenges, as the population of Earth grows exponentially.

Solutions are needed more than ever.

We need to build solutions that can reach billions of people, solutions that empower billions of people to make informed decisions, solutions designed for the benefit all humanity.

We need to look at the big picture—to look at Earth from space.

Satellites provide a bird's eye perspective—a unique perspective—of life on Earth.

There are two problems with current satellite views of Earth:

1/ there is nothing for the people

2/ there is no 'Earth live'

The solution is real-time video from space.

Video has unique attributes of movement and story-telling power which, if given to the people, can change the outcome.

Real-time video can change the outcome because video has the unique attribute of movement.

From movement it is possible to derive speed and direction.

From speed and direction it is possible to derive actionable alerts: people can be alerted and plans for evacuation and containment can be enhanced.

Let's consider the longer-term governance of our planet:

Video has another unique attribute: story-telling power

Think of the power of movies to tell a story and change the way people think, the power to change the way people feel and act ... movies move people

For people to take actions that limit climate change, a key driver is raising awareness of how our natural world is rebelling violently against human evolution. Its violent rebellion is manifested daily through natural disasters that impact hundreds of millions of people a year.

To give a sense of the scale of natural disasters, in the decade 2007-2016 there were on average each year: 354 reported disasters, 68,273 lives lost, 210 million people affected and \$141B of economic loss suffered.

To address Climate Action, we need the people of the world to act, to change behaviour, to make the difference. Seeing Earth from space—seeing how nature indiscriminately unleashes devastation to lives, communities and trade—can help change the way we think, feel and act.

Democratizing space is necessary for people to fulfil their responsibilities to each other and the future of the planet.

We need to give information to people—to democratize what's happening on our world—so we change the way people think, feel and act, and create a sustainable future.

Democratizing space can change the outcome of our present and future.

It is Sen's vision is to democratize space with unique perspectives of our ever-changing planet and our future in space, accessible by everyone, to inform, educate, inspire and benefit all humanity.

Sen will achieve this by its mission of streaming real-time videos from space to billions of people.

ENDS

## Yeoubi - SDG Partnerships and Whole-Of-Society Engagment to address Commercial Sexual Exploitation of Children

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### **Abstract:**

In accordance with Thematic Area 11 – SDG Partnerships and Whole-Of-Society Engagement – this proposal leverages partnerships between public sector and citizen actors to build whole-of-society engagement and fight commercial sexual exploitation (CSEC) of young women. This proposal focuses specifically on CSEC of minor women in West Bengal, India. The method used to address CSEC here exemplifies successful partnerships between public justice system institutions and local communities. The framework proposed in this model is intended to build institutional capacity by engaging strategic partnerships and the whole of society to address a multitude of development issues beyond trafficking.

Trafficking occurs when institutions fail to protect vulnerable populations and prosecute perpetrators of these crimes. Although India has ratified international conventions and has passed laws condemning crimes of child trafficking and exploitation, thousands of cases of trafficking are still reported every year. In the state of West Bengal alone, over 3000 cases of trafficking were reported in 2016. There are many gaps in the public justice system that lead to this institutional failure. Local law enforcement is often underpaid and under resourced to meet the challenges of investigating and enforcing trafficking crimes. Public defenders and social workers advocating for rescued trafficking survivors do not have the support needed to care for survivors or sufficient legal counsel or evidence to prosecute perpetrators in court. Because of failure in the public justice system to address trafficking crimes, there is a distrust of the public of government institutions to protect local communities from trafficking. While trafficking remains a challenge for the public justice system, strategic partnerships between public sector institutions, local communities, and individual citizens can help bridge the gaps needed to end impunity of trafficking crimes.

Yeoubi, the proposed application, is designed to meet those gaps by integrating data analytics and open source mapping to build transparency and accountability in the public justice system. Yeoubi is an open technology platform providing information on CSEC to various citizen and public sector users and equips individuals to act on the impending challenge of CSEC. This



platform is updated regularly by local police reports on CSEC incidences in the local communities and helps expand the networks of government institutions to stop CSEC. Yeoubi also provides a platform that streamlines communications between citizen users as well as law enforcement and shelter homes to more effectively and efficiently address incidences of trafficking in local communities. Yeoubi will collaborate closely with government agencies, police forces, local NGOs and civil society organizations while building up public support against CSEC.

## Gendered Homelessness in Winnipeg

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### **Abstract:**

This paper contends that homelessness among women in Winnipeg has proven to be a difficult issue to capture. This is mainly due to seldom visits to homeless shelters as a result of unsafe conditions coupled with the fear of child apprehension by Child and Family Services (CFS) among other insecurities. The Plan to End Homelessness in Winnipeg was initiated in 2014 to foster a partnership between various sectors to coordinate and improve services available to end homelessness. Homeless women are faced with a double burden of challenges together with health disorders. Thus, a call for a conscious effort to focus on the experiences of homeless women and measures that homeless women deem fit for their situation. With the growing concerns of the 2030 agenda to end poverty, homeless women in Winnipeg need to be active participants in addressing homelessness and its dynamics. Getting access to already existing data is an important aspect of this study. Drawing on the 2018 census data in Winnipeg, the study will use mixed method in examining data on services available to women experiencing homelessness. The study will map out the possible services available to women experiencing homelessness and the need to improve upon these services to include the needs of women. It will also examine the reasons homelessness among women tends to be subtle in comparison to homelessness among men. Based on the analysis, this paper may confirm or contradict the findings of existing literature that used participatory approach. Consequently, the paper will examine how homeless women are likely to grow a sense of attachment to handling issues relating to homelessness. The intersection of gender-related issues and homelessness need careful consideration. The need to address the dynamics of homelessness is much greater than policy and collaborative partnership between public and private sectors; rather a collaboration together with the people who matter (women facing homelessness).

## SDG Localisation - Avoiding Goal Washing and Cherry Picking

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**Abstract:**

Since the adoption of the Sustainable Development Goals, one of the main challenges has been to make meaning at a local level - The SDGs are complex, encapsulating 17 goals, 169 targets, and (currently) 232 indicators. Navigating this complexity can seem daunting and has likely been a cause of delay for wider adoption. In order to manage this complexity and localise the goals, two initial stages have been commonly suggested: 1) understanding relationships between the SDGs and the organisation; 2) prioritisation.

The first step of understanding the SDGs involves exploring opportunities and responsibilities the SDGs bring. In theory, this step is an exploration of fit between an organisation and the SDGs, as well as between the SDGs and the organisation. In practice it has commonly involved exploring how well the goals fit into existing strategies, not necessarily how well the organisation incorporates the SDGs into their strategies in a meaningful way - SDG designer Jakob Trollbäck refers to this as “goal washing”.

Prioritisation is the act of using the SDGs as a means of focussing effort. It makes sense because for most organisations, some of the goals, targets and indicators seem less relevant and organisations must decide where to prioritise finite resources. Discounting involves the elimination of some goals from decision making, strategy and reporting and is a common part of the prioritisation process. However, the elimination of some of the goals allows skewed emphasis to be placed on different goals, with organisations focusing on more easily achievable goals and marginalising more difficult ones. This global approach of “cherry picking” goals is popular not only amongst governments but also amongst non-governmental organisations and private sector investors,

Environment Hubs Aotearoa Network has been exploring how to localise the goals in ways that enhance strategic decision making toward the goals, avoid "goal washing" and "cherry picking", include critical local contextual factors such as New Zealand's foundational document (Te Tiriti o Waitangi), and allow for interdependencies, ripple, and spill-over effects to be reported on. We have developed a simple framework for environmental centres to incorporate and report on the SDGs without burdensome reporting requirements. What has resulted is an approach that, rather than viewing the goals as an end to which we are working, utilises the goals as a filter through which ideas flow and a lens to focus effort.

## Economic Sustainability of a Community Water System in Southern Haiti

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**Abstract:**

Though communities in Haiti have some access to water, there is a need to create locally sustainable solutions for expanded access and quality. Lack of funds for non-profits is a pressing issue for Haitian water projects. Many non-profits have built water systems which temporarily provide communities with water, however stop operating due to an inability to finance regular maintenance or replace expensive parts. High costs place a financial burden on organizations and the lack of a sustainable source of income leaves communities at risk.

The goal of Economic Sustainability of a Community Water System in Southern Haiti is to transition Tree of Hope Haiti's (TOHH) existing water storage and filtration system into a self-sustaining, income generating operation in the community of Grand-Goâve, Haiti. TOHH is a Haitian-run non-profit that constructed a water storage and filtration system in 2015 in response to the community's need for a reliable source of drinking water. Serving around four hundred individuals daily, TOHH is facing rising maintenance costs, which are currently financed by intermittent international donations. To continue serving as a sustainable water source for Grand-Goâve, TOHH is aiming to reduce their dependence on international donations for the water system maintenance by half over a period of five years. TOHH's goal is to generate \$700/year (USD) in local income and \$700/year (USD) in donations, totaling the \$1,400/year (USD) needed for water system maintenance.

This project, funded by the Institute on the Environment at the University of Minnesota, has a twelve-month timeline which includes quantitative and qualitative research, data analysis, project development, initial implementation, and evaluation. In August 2019, Girard and Funkhouser will begin by conducting a survey and interviews, guided by the principles of Community Based Participatory Research (CBPR). Contrary to many traditional methods for research and development, CBPR emphasizes co-ownership and co-generation of knowledge and prioritizes solutions that originate within the community. The hope is that through these participatory research methods, the community will provide valuable insights about their assets and needs and take ownership of the development of the most realistic income-generating program for the water system.

**Ceramics in environmental health: genuinely sustainable technologies for whole society engagement**

**Submitter: Harvey, Anthony Reid**

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**Abstract:**

In the developing world as elsewhere clay material resources tend to be abundant along with a widespread tradition of those who work with clay. In rural areas the product line for these artisans often includes such products as cook pots, water storage containers and construction bricks, however there tends to be an interest in opportunities for new products.

Such new ceramic products as water filters and environmentally responsible cookstoves will make possible many new opportunities in addition for the clay workers' neighbors. They will fabricate these life-saving devices and will in turn familiarize new users with proper use. New users may well listen to them where they would not listen to supposed outsiders while the exchange would benefit both. There is much evidence of such social engagement, for example, that for peri-urban communities there is a new paradigm of community involvement in safe water projects.

There is a doorway into development in general through introduction of two vitally needed ceramic technologies of environmental health, with devices uniquely suited in remediating the two most apparent problems implicit: 1) pathogen contaminated water, and, 2) smoke and fumes around cookstoves. The crises of these two problems result in thousands of deaths daily among small children having dysentery due to unsafe drinking water. And thousands of women and girls die every day as a result of the respiratory illnesses caused by air pollution around cookstoves.

In the January/February 2019 issue of \*Ceramic Bulletin,\* a publication of the American Ceramic Society is the article, \*Filtering safe drinking water through granulated ceramics,\* [http://tamceramics.com/wp-content/uploads/2019/01/TAM-feature\\_01-02-2019.pdf](http://tamceramics.com/wp-content/uploads/2019/01/TAM-feature_01-02-2019.pdf)

In the March 2019 issue of Ceramic Bulletin, scrolling down to page 22 is the article, \*Reducing air pollution: Insulating ceramic rocket stoves.\* <http://ceramics.org/wp-content/bulletin/2019/pdf/March2019.pdf>

Also from Ceramic Bulletin here's the link of another such article:  
<https://ceramics.org/ceramic-tech-today/international/reducing-air-pollution-insulating-ceramic-rocket-stoves>

Community members involved in the introduction of these environmental health technologies will have as their biggest challenge keeping interested the new users of such stoves and water filters. New users will not benefit health-wise if a cook doesn't like the stove or if someone unknowingly prefers water from a polluted creek.

Ceramic products go way beyond what improved water filters and cookstoves suggest and new production processes starting with high temperatures are at the origin of industrial development. Clay workers are ready to build on their knowledge and along with their neighbors tend to be ready for whole community engagement. Nearly all of the 2030 goals could be maximized with the help of the social engagement that would start with ceramics in environmental health.

## Mapping Community Development Aid in Myanmar: Combining Satellite Imagery with Spatial Analysis

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### **Abstract:**

Aid policy has the potential to alleviate global poverty by targeting areas of concentrated need. However, a severe gap exists between aid given and actual need due to data sparsity in fragile and conflict-prone states. Thus far, few aid-determinant studies have analyzed the characteristics of poverty at the sub-national level, and even those studies were conducted with their units of analysis at a high administrative level such as the state. This study intends to fill this knowledge gap by examining poverty and aid across a range of spatial scales. This approach allows policymakers to portray poverty at the granular level, and promote the design, monitoring, and evaluation of aid towards the most marginalized communities. The goal of this study is to explore the extent to which community-led-development (CLD) projects take place in poor villages, using the case of Myanmar. This study examines how much of the variance in CLD project allocation is explained by wealth and development-related measures. It also analyzes how two CLD models, National Community-Driven Development Project (NCDDP) and Saemaul Undong (SMU) target needs differently. To collect outcome variables, I develop web scraping algorithms to create comprehensive and up-to-date locations of CLD participating villages ( $n=12,282$ ). As for exploratory variables, nighttime satellite imagery is trained on the Demographic and Health Survey (DHS) to estimate wealth at the community level. In addition, I spatially interpolate the DHS wealth index to make inferences on poverty in aid sites. By geospatially matching aid and wealth data, I test factors that may explain variation in the distribution of CLD and different approaches to community development. The results show mixed evidence of poverty-oriented targeting. First, as each increment of the share of a vulnerable population rises, the likelihood of aid presence in that community declines by 4%. Next, the density of community development projects is higher in areas shining brighter. A one unit increase in the radiance value increases the number of projects by 86 within a two-degree radius of a DHS village cluster. Among villages of similar levels of nightlights and population, however, aid goes to areas with lower assets. Last, NCDDP, which emphasizes inclusion and collaboration, supports poorer villages farther away from conflict events. In contrast, SMU, which considers competition conducive to performance, supports more established areas including villages near conflict zones. To conclude, CLD in Myanmar disproportionately flows to better-off communities. However, unlike previous studies finding that state-level aid allocations favor the richest, a more fine-grained analysis suggests that a need-based allocation is also in place. In this study, the nuances captured in nightlight luminosity are shown to improve predictions of aid distribution. Synthesizing new sources of data can be used to assess area-based interventions in the context of poverty and conflict where traditional surveys are too costly.

## Localization: the key to realizing SDGs in Nepal

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### **Abstract:**

Localization of SDGs, in the context of Nepal, is a modality appropriate for getting the targets achieved in time. It prepares and facilitates all 753 local governments spread over 77 districts of 7-Province- Federal State to make arrangement for fulfilling the goals by 2030. Moreover, it seeks to address the current gap that exists between SDGs and the country's socio-political, economic, and technological sector besides addressing the pressing problems facing the country particularly in point of good governance and corruption.

The rationale behind the proposition for the model is based on the finding that the country has not yet been able to drive or motivate the local levels to focus on SDGs. After nearly two years of operation of elected government at the local level no workable track for concentrating on achieving the goals has yet been carved out. SDGs, in a sense, find room in speeches of political leaders, rhetoric of planners (15th Five Year- Plan to be initiated in July, 2019) and government's formal progress report of ministries concerned. To people in general, SDGs appear something to be handed over by authority in power. The move to take initiative to engage people's representatives at the grass root level for SDGs is virtually absent.

One strategy that the initiative for localization of SDGs follows is: creating ward level status from the perspective of 17 goals, detecting the fissure, and working out ways to close the crack and chart path for SDGs. Engaging local level leadership and decision makers to formulate policies and plans with priority emphasis on the SDGs and approaching people of the ward concerned to participate in them with full information and awareness constitute the basic strategy the initiative pursues.

Since all 17 goals are in a sense interlinked with public life and they are simply unattainable without three components: public understanding, public participation and public commitment, grass-root level intervention in development works, plans and policies is essential. Ensuring commitment of local leadership and people is the only way that could prepare ground for all the three components. It would also be instrumental in laying foundation for investment for SDGs.

As for example, some goals refer to "no poverty, no hunger, good health and well being and quality education" and they require high level public engagement. They are not something to dole out; special provisions should be made for making people understand them, participate in them and own them. Similarly the mission of gender equality, clean water and sanitation, affordable and clean energy and decent work and economic growth is so associated with public way of life, public belief systems and public behavior that there can be no overnight wishful change in them. They need massive and regular input of local engagement (ownership and participation) for appropriately sensitizing people about their importance and practice.

## Community-based ecotourism in the context of the Sustainable Development Goals: A case study on the impacts of tourism on livelihood strategy and poverty alleviation in the Maya Biosphere Reserve

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### **Abstract:**

Worldwide, ecotourism development in vulnerable forest communities has been promoted as a means to achieve the Sustainable Development Goals (SDGs) by contributing to both conservation efforts and local livelihoods. Despite intentions for tourism development to contribute to sustainable forest management, local economic growth, poverty alleviation, the empowerment of women, and climate change mitigation, ecotourism initiatives often fail to reach these lofty objectives. Tourism revenues remain unequally distributed and more socially marginalized individuals, particularly women, are excluded from full participation in tourism employment and management decisions. Approaching tourism from a whole-of-society engagement perspective, this project examines whether the community-based tourism model, in which local people control tourism management decisions, contributes to a more equitable distribution of the benefits and costs of tourism and to greater opportunities for local residents to participate in the tourism market. Theoretically, by devolving the rights to manage tourism to local communities, the local benefits of tourism should be maximized, thereby both alleviating rural poverty and promoting conservation through financially incentivizing protection of the natural resources that attract tourists. At a local level, Cooperativa Carmelita, a community-managed forest concession running a tourism cooperative within the Maya Biosphere Reserve in northern Guatemala, provides an ideal case study to understand how community-engaged tourism development contributes to local progress towards the SDGs. Through collaboration with the Rainforest Alliance, I examine how community tourism in Carmelita has changed livelihood strategies in ways that affect forest conservation, to what extent participation in tourism generates income-earning opportunities for local community members, and what barriers exist to participation in the tourism cooperative. Through review

of tourism management plans and interviews with cooperative members and non-members in the Carmelita concession, this project describes both individual motivations and barriers to participate in tourism, as well as the broader impacts of tourism development in the community. The community-based tourism cooperative in Carmelita potentially serves as a model for understanding how broader social engagement with tourism development can contribute to the promotion of the SDGs.

## The Role of Corporate Platforms in Social Change

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### **Abstract:**

Sustainable development relies on the effective distribution of resources between stakeholders and sectors, and nowhere is this intersection more promising than in corporate social responsibility (CSR). The seamless translation of feminism theory, initially conceptualised on a grassroots, urban-poor level, to marketing campaigns used by multinational corporations, is a commonplace example of this. Professional firms are also capitalising on the trend. Most law firms have pro bono practices and management consulting firms, such as Bain and Company, have pledged to invest 1 billion in social impact strategies over the next 10 years, through targeted secondment opportunities. Clearly the boundaries of sustainable development have become blurred, and leveraging important social issues from corporate networks, internally or externally, is a powerful way to create change.

From the delivery of Emma Watson's eloquent UN speech, celebrity endorsements, and most recently, the #MeToo movement, gender equality (SDG 5) has established itself in popular discourse. To corporations, this is now a highly marketable space. From Dove's 'Real Beauty' campaign, Gillette's toxic masculinity advertisement, and Fenty Beauty's celebration of diversity, multinational corporations have been applauded for starting conversations around female empowerment. While this can benefit profit margins, it is also a highly promising space to secure sustainable development outcomes, should measurement frameworks or regulations quantify them effectively. The London Benchmark of Impact Measurement, which measures outputs and qualitative impact, is a particularly comprehensive tool to distinguish vaporous hype. Merely challenging female stereotypes, for instance, is not conducive to sustainable development, however raising awareness of prevalent political issues can create real impact.

When corporations are used as a vehicle and platform for change, while simultaneously incentivised by the bottom line, it eliminates unnecessary sacrifices and results in win-win solutions for all stakeholders. Today, up to 81% of millennials expect companies to make a public commitment to good corporate citizenship. Such an expectation indicates that prioritising social impact initiatives – feminism, sustainability, or other causes aligned with the



corporate mission – will assist corporations to procure the best talent and powerfully persuade their clients and consumers through furthering trust. There is more awareness amongst young people regarding this power than ever before. However, more can be done to keep corporations accountable to pledges on a national and multinational level through social media and consumer culture.

With strong rules, corporate platforms can be used effectively to stimulate real dialogue between consumers on a national and multi-national level. There is understandably, some cynicism in relation to CSR, that perhaps corporate involvement abuses societal issues to service neo-liberal economic ends. And yet if leveraged in an ethical way, its reach is far beyond anything the social enterprise or non-profit sector could achieve in isolation. Translating grassroots issues to a business-oriented, developed world does not automatically change its definitions to indicate individual power, achievement and status. Subtle changes in corporate culture, with its huge clout in today's developed world, can make massive leaps in sustainable development, and its power should not be so swiftly dismissed.

## Synergies of justice: Exploring the co-beneficial sustainability dimensions of Canadian Harm Reduction Policy

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### **Abstract:**

In order to create a sustainable future for the Canadian public, population health and its various facets must be addressed. Furthermore, an understanding of the synergies and trade-offs that exist between various policy domains is crucial for progress toward a sustainable society. As an increasingly severe public health issue, drug abuse and the policies that influence it must be understood within the context of sustainable development. The harm reduction approach to drug policy provides a potentially useful framework for addressing these health issues, offering an evidence-based approach to drug policy that aligns with sustainable development both practically and ethically. However, the relationship between the two fields is largely unknown. Here, I show that Canadian harm reduction policy documents across British Columbia, Alberta, and Ontario inadvertently address a variety of sustainability concerns. I found that the HRPDs maintain a focus on a multitude of common issues such as health- access to services, and democratic governance- all of which hold significance within the sustainable development literature.

Furthermore, the document analysis revealed a general failure of the HRPDs to consider long-term outcomes, potential hazards and the ecological components of drug use, thereby opening opportunities for future policy improvement. The results demonstrate a direct overlap of a variety of objectives between Canadian HRPDs and sustainable development, as well as identifying the policy areas where sustainability concerns could be better engaged with. By

understanding these synergies, future policy can be engaged to create co-beneficial, cross-discipline outcomes.

## Challenges for Youth Participation in Community Development Initiatives: A Case Study of Botswana and Sustainable Development Goals

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### **Abstract:**

Youth participation in community development has been viewed as one of the most effective methods for promoting young people's active engagement with social services. However, in Botswana, young people's participation is limited due to different constraints which results in young people participating less in community development initiatives such as the Sustainable Development Goals(SDGs) initiatives. The purpose of the study is to find out what the challenges for youth participation in community development initiatives are with a focus on the sustainable development goals. The basic design of the study for the paper is descriptive, it describes the challenges that youth face when participating in SDG's community development initiatives. The main types of the study design that have been used in the paper are case study methods and survey methods. The paper also used a mixed method research design. A review of literature was conducted to determine the existing challenges that youth are facing when it comes to participation in community development initiatives. The study was guided by the following objectives: To determine the influence of youth participation in community development projects and initiatives. To provide recommendations on ways of overcoming the challenges that young people face when desiring to participate in SDGs community development initiatives. To determine the challenges that youth face when participating in SDGs community development initiatives. The major findings revealed that youth in Botswana do not have adequate access to information on youth initiatives, this is due to the internet dividend . The findings revealed that young people do not face any challenges when volunteering mostly in youth-initiated community development initiatives in Botswana and some of the youth initiatives are linked to the sustainable development goals. The findings also revealed that an age limit to some of the community development initiatives for sustainable development goals is a challenge for young people to participate in them. Lack of awareness about available sustainable development goals and community development programs, that youth can participate in was identified as the major barrier preventing youth participation. The study's main recommendation is to adopt the positive youth development approach in community and sustainable development goals programs for increased youth participation. The positive youth development approach will make young people feel included and proactively participate in the SDGs community development initiatives. Another recommendation is for increased efforts in education institutions, community councils and development Organisations

to involve young people in effective and instrumental participation in community development initiatives.

## The Perceptions of Perpetrators and Victims on Water Development and Genocide in Rwanda 25 Years Post-Conflict

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### **Abstract:**

In April of 2019, Rwandans commemorated the 25th anniversary of the 100-day genocide in which over 800,000 Rwandans were killed at the hands of their brothers. In the 25 years since this conflict, Rwandans have established peace and justice between perpetrators and victims as well as resource and economic development far surpassing many other post-conflict states. In order to achieve these goals, Rwandans, regardless of identity as Hutu or Tutsi, bound together in order to achieve their development goals. This grounded theory study examines the perceptions of perpetrators and victims of the Rwandan genocide on water development issues post-conflict and the role of water in post-conflict peacebuilding. There has been an emphasis in water-related research to focus on the relationship between water development and peacekeeping efforts in general. However, the research has not reflected on the effects of water development in post-conflict rehabilitation specifically relating to reconciliation and rebuilding after genocides. This lack of research primarily fails to understand the influence of water issues on post-conflict reconciliation between perpetrators and victims as seen after the Rwandan genocide and how every member of society is critical in establishing sustainable development. By focusing on the role of natural resources as a potential means of establishing peace after genocide, this study examines the role of water stability and development in aiding rehabilitation and restoration between perpetrators and victims after the Rwandan genocide. Through semi-structured interviews with Rwandans who live before, during, and after the genocide, coding was used to develop a grounded theory attempting to explain the perceptions of perpetrators and victims of the Rwandan genocide on water development issues. Developing a theory about how Rwanda has responded to water issues post-conflict is critically important due to the fact that water issues are increasing in the world. Engaging whole communities in rebuilding effective water infrastructure encourages communities to reconcile and aids in establishing stability post-conflict. Through understanding the perceptions of both perpetrators and victims of the Rwandan genocide and examining how water issues have been addressed by communities, this study opens the door for improved technologies to be implemented in future post-conflict states by engaging every member of society.

## Wildlife Conservation and Livelihood Development in Community-owned Protected Areas in South Africa

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**Abstract:**

Often times conservation goals are considered to be in opposition to the needs of people, but communities around the world are challenging that perspective by demonstrating how sustainable land management conserves and protects biodiversity, and derives economic benefits. Hluhluwe-iMfolozi Park (HiP) in South Africa is the oldest conservation area in Africa, designed to protect wildlife and is known around the world for their contribution to rhino conservation. Surrounding the HiP are 52 communities, many of which were displaced when the park was established. Now, many efforts are underway that incorporate the livelihood needs and development goals of these surrounding communities, such as community owned lodges and local craft markets, but it is unclear which community needs are being addressed and if natural resources are being managed sustainably and equitably.

When the Mpembeni Community designated their own land to conservation in the early 2000s, they hoped to gain economic and social development benefits through stewardship of the region's biodiversity and tourism. Threats to biodiversity, continued social conflict, a limited capacity to manage natural resources, poaching, and competition with other nature reserves challenge the realization of these benefits. The Mpembeni Community founded the five-star resort "Rhino Ridge" to develop ecotourism opportunities. However, community level benefits from this resort remain unclear.

Our team has backgrounds in: conservation biology, health, and social entrepreneurship which positions us well to support the development of strategies to navigate socio-ecological issues. By understanding the needs of community members, NGOs, and researchers and facilitating conversations across disciplines, we aim to enable whole-of-society engagement. From there, in collaboration with relevant stakeholders, we will provide information for them to make informed decisions and create a platform for: environmental conservation, community development, and ecotourism opportunities.

In collaboration with students and faculty from the University of Mpumalanga and local community members, our main objective is to support biodiversity conservation (SDG goal 15) and the development of livelihood opportunities in the Hluhluwe-iMfolozi Park (SDG goal 1). To do this, we aim to facilitate conversations among local stakeholders and deliver reports and presentations based on the findings collected through interviews, surveys, and participant observation.

Our work will cover three main topics to ensure that our recommendations are sustainable and resilient to the previously mentioned threats. Our primary focus is on the intersection between community development, conservation, and ecotourism, which will be broken down into

examining: Mpembeni Community development needs, community-based or community-owned projects and their effects on livelihoods and wildlife, and the viability of ecotourism.

## Engaging the private sector for sustainable development through corporate social responsibility.

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### **Abstract:**

Many developing countries continue to suffer from economic, social, and environmental challenges. Their governments most times do not have the capital required to fund the scale of developmental projects required to achieve the SDGs, leaving them and their citizens in what is also known “poverty trap”. What this implies is that a business as usual approach method is no longer effective, and more hands must be on deck to innovate lasting solutions. This paper argues that partnerships are critical to achieve the SDGs and the private sector will play a key and most important role. The private sector is not only the largest formal employer in many developing countries but is known for efficiency, disruptive innovations and capacity to scale solutions. It becomes crucial to apply this to development issues.

Specifically, I focus on corporate social responsibility as the entry point for private sector involvement. It is important for actors (government, civil society) and the private sector to rethink how CSR is currently perceived or structured at different levels. This paper suggests that a conversation on what CSR means or should be in a country, at the national level (in individual countries) might be a good place to start. This is because of the variation in CSR definitions that exists in different countries, for some its employee engagement, for some it's going good in the host community. Research also shows that more companies are adopting the concept of social good; but how does this scale this up or be more impactful? A review of Toyota's CSR is also examined in the paper for more insights on how CSR could be made more impactful. Good policy level practice worthy of emulation (India) will be also be delved into in the paper. India made history recently by signing a CSR 2% bill into law. This enshrines corporate giving into law and requires businesses with annual revenues of more than 10bn rupees giving away 2% of their net profit to charity, through investiture in education, hunger, poverty, gender equality. Although there tend to be policy disagreements by different writers on this, it reflects an example of a deliberate attempt to engage the whole of the society in development.

It is my hope that by examining these CSR policies and practices in this paper, more understanding is provided to all stakeholders on the need for more inclusive partnerships and whole – of -society engagement through well-structured CSR policy and programming.

## Sustainable Development Goals in the context of Primary Health Care in Sri Lanka

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**Abstract:**

Sri Lanka provides free universal healthcare and one of the few countries in the world with free healthcare and education, both of which have been national priorities for decades. Over the last, few decades both the government and private sector have been rapidly improving infrastructure, quality of services and human capital base in the healthcare sector. Despite low levels of government health expenditures, Sri Lanka's health indicators are comparable to more developed countries in the region. The public healthcare system also has long waiting lists for specialized care and advanced procedures. As a result, reliance on private care is increased. Given this background, this study investigates the progress of the health indicator under the sustainable development goals in Sri Lanka. The primary analysis and observation of the trend of the indicators shows that Sri Lanka can be place much ahead in terms of health outcomes compared to the neighboring countries. However, this situation can be change by the demographical (health of ageing population) and epidemiological transitions, as well as the country's move towards a high-income level. Theoretically, there is no doubt that SDG Goal 3 is relevant to Sri Lanka. However, Sri Lanka has the responsibility of making adjustments to SDGs to suit the country but within the given framework. It is important to form an institutional mechanism with a strong political commitment, which can ensure effective planning, implementation and monitoring of SDGs. Also, prioritize the SDGs to be aligning with national health policy initiatives through proper monitoring and evaluation systems at regional and national levels. As a middle-income country, we achieved most of targets but may achieve other before 2030. There are some reasons for this achievement. Sri Lanka has the best health indicators in the region. It has the unique distinction of having GNI per capita of less than thousand US dollars (850 US\$, 2002 World Bank report) and yet achieved this degree of success in health. Another health indicator where Sri Lanka has done well is the life expectancy at birth. As stated, particularly among females it has been 90%. This was a direct result of state free education and health policy adopted in 1940's fully implemented in 1950's. Therefore, health education is making easy, any health message reached even very rural parts of Sri Lanka and accepted by the rural community.

Keywords: Sri Lanka; Sustainable Development; Primary Health Care; SDG Goal; public healthcare system

## Restoring lost trust on the public sector: a behavioral science perspective

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**Abstract:**

During the last decades, several institutions in our societies have experienced an acute decrease in indicators of trust, and governments are one of the most affected entities. As the

public sector is called to be a key actor to implement and bring society together towards the SDGs, the issue of lack of legitimacy and trust in our public sector institutions is a burdening one.

For example, data shows that the percentage of the population reporting confidence in the national government in OECD countries went from 44% in 2006 to 38% in 2015, however some countries show even a higher decline. France, the US and Australia show declines close to 10 percentage points, whereas developing countries such as Mexico and Chile even larger figures.

Even though this is a highly systemic problem, innovative approaches can provide assistance help to bridge this gap. One that has shown promising results is to embed behavioral insights into policy design: the use of new research about how we make decisions and use this knowledge into policy design can help to bridge the gap between governments and its citizens.

The present document provides evidence on the extent on which trust and legitimacy has been eroding, presents insights on how to include behavioral design into policy, as well as into development projects, and finalizes with a more theoretical discussion on the limitations and challenges of this approach.

## Sustainability into Business Strategies : Analysis of Samsung Electronics Case Studies

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### **Abstract:**

As sustainability has been recognized as a vital component of global business competitiveness strategy, corporations are increasingly building sustainability into their corporate strategies while linking outcomes to the Sustainable Development Goals(SDGs). This article aims to evaluate aspects relate to corporate sustainability performance applied in the South Korean context. It further analyzes the unfolding of socio-environmental initiatives in the corporate business and the adaptation of reports on sustainability indicators to highlight the challenges involved in these issues. The study is based on case studies, exploring empirical evidence in one of the global companies based in South Korea, Samsung. For this, internal and published documents as well as semi-structured interview with sustainability team are used. While Samsung has brought recent efforts to bring new understanding, knowledge and policy to improve the quality of sustainability strategy across its diverse business sectors, the study analysis points out the difficulty of incorporating sustainability into the business context, requiring collective efforts of multidisciplinary teams to understand the trade-offs and inter-relationship between the pillars of sustainability. Furthermore, it appears that the use of Global



Reporting Initiative indicators can serve as a basis for initial performance measurement system in companies.

Keywords: Corporate sustainability, Sustainability, GRI indicator, SDGs

## The Role of Multi-Stakeholders Partnerships (MSP) in SDGs Monitoring

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### **Abstract:**

Two years since the enactment of Indonesia's Presidential Decree on SDGs No. 59 the year of 2017, Indonesia have produced several efforts in SDGs implementation such as (1) The Launching of SDGs National Action Plan in June 2018 that will be effective until 2019; (2) 19 out of 34 Provinces have issued Governor Regulations on SDGs Sub National Action Plans; (3) The finalization of SDGs Roadmap from 2017 until 2030. All of these documents are formulated by Ministry of National Development Planning (Bappenas) as the focal point of SDGs in Indonesia along with non-state actors (philanthropy and businesses, CSOs and media, universities and academicians). To ensure the no-one-left behind principle, Indonesia also acknowledges the involvement of non-state actors as part of the National Coordination Team of SDGs which has been mandated through Ministerial Decree No.127 the Year of 2018.

These following progress and achievements have proved that government is not the only actor that responsible to ensure the attainment of the SDGs. Following that situation, this paper would like to encapsulate the Indonesia Government effort to implement SDGs through strengthening Multi-Stakeholder Partnerships (MSP) in achieving SDGs. In particular, to overcome the challenges to integrate the non-state actors program into the SDGs National Action Plan and synchronize the government priorities with non-state actors. Considering that Indonesia is broad and have unique development challenges, the MSP also needs to be promoted to monitor SDGs implementation and achievements not only at the national level but also sub-national levels.

## Creating Low-carbon Communities: Evaluating the Role of Individual Agency and Systemic Inequality in San Jose, CA

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### **Abstract:**

Following a scholarly need to test compelling community level sociodemographic representations of environmental behaviors and outcomes, a sequential mixed method approach was used to evaluate the connections of human agency and systemic inequalities with carbon footprints. The 2016 SDG San Jose Dashboard data of city blocks and 2013 ACS



survey data were supplemented with interviews with ten climate action-oriented community engagement professionals in the South Bay. Boundary limiting socioeconomic conditions for systemic inequalities and human agency, dimensions of Giddens's Structuration model, were also specified. Partially supporting structural inequality theories, socioeconomic resources and dominant race concentration were associated with larger carbon footprints, particularly when wealth is concentrated. Both human (time driven alone) and demographic (senior and mid-aged blocks) agencies were also partially at play in shrinking or enlarging carbon footprints, in wealthier communities. These findings not only contributed to the literature on climate action, but also highlighted the need for targeted interventions in communities of different socioeconomic standing.

## **Adaptive Skilling- A joint journey of a CSO, a University and tribal villages to usher in societal justice and ecological sustainability**

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### **Abstract:**

In the present agriculture scenario farmers to a large extent are getting dependent on market, starting from purchasing of inputs such as seed, fertilizers and pesticides to sale of the produce. Farmers follow the package of practice as prescribed by seed companies or the extension workers. As the focus is more on production and income enhancement, reckless use of pesticides, fertilisers etc is resulting in degrading soil quality, harming bio-diversity and polluting environment along with irreversible effect on human health. The intergenerational knowledge of local ecology and skill of farming have taken a back seat and getting lost slowly. This scenario becomes especially significant for the Adivasis[1], living in the central Indian plateau, whose life world is intricately woven with forest and land—farm and non-farm. The advent of modernization is changing this intricate relationship and making the Adivasis devoid of the skills and knowledge required for living with nature. This calls for a set of practices where farmers critically look at new technologies, understand its impact on the ecology and adapt according to their context rather than blindly following the practices proposed by the input dealers in expectation for higher yield. Some Adivasi farmers from central Indian Plateau along with some development professionals from PRADAN and professors from Azim Premji University have started an action research called Adaptive Skilling Action Research (ASAR) to come up with more sustainable way of production, which not only re-skills farmers and addresses their livelihood needs but also makes the social-ecological system that they are part of, more resilient. This can be achieved working on two aspects. The first aspect is about how

an individual's decision and action affect other farmers and the farming system. So, there is need of a platform for information sharing and collective decision making looking at the balance between individual and collective benefit, ecological sustainability being one of the most important of those collective benefits. And second, there is a need to revive the old skill and knowledge which helped the farming community, especially the Adivasis, to live in an ecology comprising of both forest and agricultural land. These multiple processes helped the Adivasi community of Amarpur block in Madhya Pradesh, India to create a platform to regularly deliberate on issues related to rejuvenating the forest ecology. They have, on one hand, began the process to get their community forest rights (CFR[2]) from the forest department, and on the other hand, the older generation of villagers started engaging with the school going children to introduce them with the floral diversity in the forest and various uses of different plants available in the village and in the nearby forest. This dual process will be helpful for rejuvenating the forest-land ecology on a sustainable manner. Process of creating such platform has also been started in Deosar block in Madhya Pradesh and Gumla block in Jharkhand.

This paper will explore how a CSO, a University and three villages are partnering together to explore the whole-of society engagement to move towards SDGs.

[1] Adivasi is the collective term for the indigenous peoples of India, majorly from the Central Indian Plateau

[2] [www.fra.org.in](http://www.fra.org.in)

## Gender & development projects: Stories of navigating capabilities and agency from Almora, India

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**Abstract:**

The present study, contextualized in the hill districts of the Himalayan region in India, explored women's freedoms as contoured by developmental projects working with women as beneficiaries. The analytical paradigm used is of the capability approach (CA) proposed by Amartya Sen. Here, development is viewed as freedom: the real opportunity we have to accomplish what we value (Sen, 1992, p.31). Freedom thus constitutes of the opportunity aspect of capabilities (ability of a person to achieve those things that she has reason to value" from a range of other good possibilities), and the processional aspect of agency (ability to act

on behalf of what matters).

The study adopted a mixed-methods approach, combining household surveys, interviews, focus group discussions (FGDs) and participatory rural appraisal (PRA) methods. Primary data was collected during 3 month-long fieldwork with the participants of the Integrated Livelihoods Support Project (ILSP), an IFAD-supported project in the state of Uttarakhand, India. Three villages (two intervention and one non-intervention) were selected for the study in Almora district of Uttarakhand. The research aimed at understanding women's well-being, capabilities, agency, and freedoms in the region.

The Measuring Empowerment (ME) Framework (Alsop & Heinsohn, 2005), which rests heavily on the conceptual offerings of CA, was used to guide research design. Empowerment in ME is operationally closer to Sen's notion of capabilities expansion. To get closer to Sen's conception of agency, ME's asset-based framework is complemented by construction of Relative Autonomy Index (RAI).

The findings of the study show that women control fewer material and financial assets, while managing the household's subsistence needs. Access to information was low, and organizational association through group membership was yet to be perceived as an 'asset'. Institutional participation was limited to expectation of network benefits, and public engagement was perceived as a masculine arena. As such, women's actualised capabilities are low; hindered by rigid structural barriers and developmental trajectories that reinforce their traditionally contoured dependence. These findings were similar across the intervention and non-intervention villages. Despite these barriers, there is a strong desire for upwards mobility and a better life for their children, as reflected in the higher relative autonomy observed in the domain of children's education. Traditional roles continue to shape most domains of women's lives, while current developmental discourse ascribes additional responsibilities to them as development actors. This dual-burden of contrasting roles and responsibilities can be a source of anxiety, and leaves little space for women to negotiate their ideas on freedoms.

The paper would capture various discourses on freedom, contextualized in the Indian context while also discussing the findings from a broader perspective of sustainable partnerships in design of development projects. The standard, centralised processes undertaken to achieve development outcomes may frequently bypass structural hindrances encountered by women with their multiple roles and identities. Thus, exits the opportunity to further refine these processes, through effective partnerships between actors in the civil, state, and market arenas.

Keywords: women, capabilities, agency, freedom

[A Viable Path Towards Eradicating Extreme Poverty and Achieving A Planetary Civilization by 2050](#)

**Submitter: Valley, Sean**

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**Abstract:**

This proposal is loosely adapted from the Product Red campaign launched in January 2006. Product Red, (PRODUCT)RED™, is a for-profit brand which is licensed to partner companies such as American Express, Apple Inc., Converse, Gap and Giorgio Armani. It is an initiative begun by the British music group U2's front man, Bono and Bobby Shriver of Debt AIDS Trade in Africa (DATA) to raise money for the Global Fund to Fight AIDS, Tuberculosis and Malaria.

The above mentioned companies all agreed to donate a portion of the revenues earned from the sale of certain products towards this fund. This is done in an attempt to purchase the critically needed Anti retroviral drugs (ARVs) which are used to combat the effects of HIV/AIDS in Sub Saharan African countries. Taking this medication which would have been otherwise unaffordable to these said countries literally means the difference between HIV/Aids being a certain death sentence, or being reduced to a manageable illness ( as it has largely become in North America and Western Europe). To date, this campaign due largely to the insatiable appetite of consumers in the developed world, has saved millions of lives in the world's poorest region, enabling previously bed ridden victims, to resume their lives as functioning members of their society. As a result of this success, in that part of the world ARV drugs are commonly referred to as the "Lazarus" drug.

The most remarkable feature of this concept was its ability to get consumers, particularly those of the wealthy world, to contribute to a noble cause by doing what they do best i.e. shopping (consumer philanthropy). While it must be noted that the Product (Red) model is not foolproof and has been criticized on various aspects of its modus operandi, there have been noticeable results, since the project's implementation.

What this model demonstrated was the ability of the private sector/civil society to successfully tackle a pressing social issue, which has long been considered, the sole purvey of national governmental agencies and/or charitable organisations. In this vein, said model can thus be modified to make the combating of extreme poverty, this time with the assistance of the private sectors across the developing world, the desired objective.

Despite being home to most of the world's poor, developing nations across the globe, due to a number of factors such as a rise in economic prosperity over the last few decades, sheer sizes of their population (i.e. large markets based on volume as opposed to margin) and their endowment of natural resources, have come to boast some of the most internationally competitive private sector enterprises. According to a 2008 study conducted by auditing firm Ernst and Young, multinational companies from developing nations made up 19% of the cumulative stock market capital of 1,000 global companies in 2007 compared to just 5% in 2000. Similarly, of the 1,000 largest stock market capitals, 221 are from developing countries as

opposed to just 100 in 2000.

India's Tatta Group of Companies, and Reliance Industries, Sub Sahara Africa's MTN Group (South Africa) and Dangote Group of Companies (Nigeria), Brazil's Petrobras and Telefonica all bear testament to this growing trend. If the entire or at the very least, the majority of the corporate sector within a given developing nation/region can be persuaded, along similar lines as were their counterparts for the Product Red campaign, to contribute a small percentage of their profits (i.e. one percent or thereabouts) towards a regionally based fund which can be called the Poverty Eradication Fund (PEF), this could result in the laying of the foundation, for the slow, but steady eventual demise of extreme poverty in this particular part of the world. Based on statistical projections of the continued reduction in the number of persons living in absolute poverty, both as a percentage as well as in absolute terms over the last few decades, it may be forecasted that in the long run, i.e. decades from now if current trends persist, extreme poverty would have eventually run its course, becoming consigned to history. As the name suggests, the ultimate aim of the PEF would be to expedite this process, with a proposed target date of before the middle of this century.

## **SDGs: Making Trade-offs and Synergies Transparent**

### **Blockchain for Sustainable Development Implementation for Humanitarian and Development Aid Distribution**

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#### **Abstract:**

The world faces numerous challenges in its attempt to achieve a sustainable future. The role of technology is expected to accelerate the world's progress in achieving the Sustainable Development Goals (SDGs). Blockchain technology is digital ledger that stores transaction in a distributed network based on consensus and has been highly praised for its transparency feature. This research presents a critical assessment on the use of blockchain solutions for SDGs, specifically to improve development and humanitarian aid distribution. The critical assessment includes analysis on how blockchain solves development challenges such as challenges with data and aid management. The research also features the limitation of the current blockchain solutions model and as well as recommendation for the future.

### **A new model to assess progress towards SDGs implementation**

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**Abstract:**

According to the UN Agenda 2030 and the Sustainable Development Goals, policy makers have to consider the sustainability perspective in strategic planning decisions. Identify and measure the level of sustainability, through its three dimensions, is a priority. This is the only one way to understand if and how a Community, a Region, a Nation is on the path of sustainability. In order to achieve these objectives, decision makers need adequate technical support, since the basis of good decision making rests on ex ante evaluation, in progress monitoring and ex post evaluation.

However, sustainability assessment is one of the most complex types of appraisal methodologies. The aim of this paper is to present a new model, integrating Multicriteria Analysis and Geographic Information Systems, specifically developed for helping Decision Makers to make policy decisions about sustainability in planning. The model is a QGIS plugin for sustainability assessment in geographic environment, using multiple criteria: environmental, economic and social. The three dimensions of sustainability are represented by means of a specific set of indicators. The model implements the algorithm TOPSIS, which defines a ranking based on distance from the worst point and closeness to an ideal point, for each used criteria. Through this model, a territorial area can be analyzed, evaluating the sustainability of territorial units within it. For example, the analyzed area could be a country, and the units to be evaluated the regions within it, or it could be a single region, and the units to be evaluated the municipalities within it. An important feature of this model is its ability to provide decision makers with an evaluation of both global and local systems, considering short and long time reference periods, in order to determine actions to be implemented in a certain area. The model provides output easy to be understood by not experts; the evaluation path is traceable and transparent, thanks to back analysis.

The integration of MCDA-GIS resulted to be a useful tool for sustainability assessment.

## Food Security and Oil Rigs in Ekumfi Narkwa, A Fishing Community in Ghana: A Threat to the Future of Work and SDG2?

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**Abstract:**

Food is an important prerequisite for every living organism. Notwithstanding, one thing is certain—food insecurity has been a long-standing concern facing developing nations, particularly coastal and rural communities. This study employs the ecosystem services framework to examine the extent to which fisher folks in Efasu in the Western region of Ghana confront the challenge of ensuring food and job security in their community in the face of depleting fish stock due to the activities of oil exploration companies.

The study employed both quantitative and qualitative approaches. It used an exploratory descriptive design drawing on both primary and secondary data. Primary data were sought from active and inactive fisher folks (Male and Female). Sources of secondary data included published and unpublished materials. Both simple random sampling (Probability) and purposive sampling (Non-probability) procedures were used to arrive at a total of 85 respondents on the basis of gender, the number of years in the fishing business, and how informed the fisher folk is in the community.

It was revealed that gender, level of education, age, household size and the number of regular income earners (socio-demographic characteristics) of the participants had effect on their ability to have enough to eat and feed their family (Food security). Another finding was that the erratic climatic conditions in the community coupled with the use of oil rigs for off- shore drilling had negative effects on fishing with adverse implications on food security. It was further revealed that the fisher folks' expenditure on food surpassed their income from their fish catch, and others were rendered jobless as their main source of livelihood had been taken away by oil exploration activities. Finally, the fisher folks cope by adopting various means which are all unsustainable.

It is recommended that government of Ghana with the support of oil drilling companies intervene with social protection and safety nets that support small scale fisher folks, especially rural women by providing for them some alternative income generation opportunities. The government needs to also take a cursory look at rural development and investment in crops, livestock, and fisheries which are regarded as powerful tools for fighting food insecurity and ensuring sustainable development.

**Choice of climate change mitigation policies and measures in the G20 countries: trade-offs, co-benefits and missed opportunities for the SDGs**

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**Abstract:**

The Paris Agreement on limiting global warming to well below 2°C and Agenda 2030 on the Sustainable Development Goals (SDGs) were adopted in 2015. Although independently defined, a number of targets within these agreements are strongly interlinked and the literature has shown that climate change mitigation measures directly affect most SDGs. While these interlinkages are predominantly synergistic, suggesting a high potential to simultaneously tackle both climate and development issues, it is also essential to understand and address trade-offs, as these are the main barriers to adopting ambitious climate change mitigation measures. However, while progress has been made on identifying potential interlinkages, no overview of countries adopted climate change mitigation policies, how these may interact with other SDGs, and what other measures could be implemented to further reap co-benefits has been conducted.

This study aims to address these gaps by assessing climate change mitigation measures adopted in the G20 member states, which jointly account for approximately 80% of worldwide greenhouse gas emissions. In this assessment, we use the Climate Policy Database ([www.climatepolicydatabase.org/](http://www.climatepolicydatabase.org/)) for an overview of climate change mitigation policies and measures currently in force in the G20 member states. By mapping these identified policies and measures against the mapping of SDG impacts developed by Iacobuta et al. (forthcoming), we determine which SDGs are positively and negatively affected by climate change action in the G20 member states. Moreover, by considering the current implementation level of each SDG in these countries we identify missing climate change mitigation measures and policies that could concurrently further sustainable development areas in need.

The advantage of using the scoring approach developed by Iacobuta et al. (forthcoming) resides in that it does not only indicate the direction of the impact (positive or negative), but also shows whether the impact depends on the context in which a measure is implemented. This second indicator is essential in determining whether potential synergies or trade-offs can be tackled in the policy implementation or policy design phase, given a context-dependent or independent impact, respectively. Hence, this approach can further inform the need for



horizontal (across areas of sustainable development) and vertical (across levels of governance) cooperation and partnerships, for improved policy design but also for maximizing synergies and minimizing trade-offs in implementation on the ground.

## The Nexus between Smallholder Farmers' Awareness of Sustainable Development Goal 2 and Household Food Security in Northern Region of Ghana

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### **Abstract:**

This study assessed whether or not smallholder farmers' awareness of sustainable development goal 2 improves household food security in Northern Region of Ghana. The study used primary cross-sectional data collected from two districts and two municipalities in the region. A conditional recursive mixed-process (CMP) with ordered probit outcome was used to estimate the effects smallholder farmers' awareness of sustainable development goal 2 on household food insecurity experience scale. Distance of households to district capital, regional capital and members of farmer-based organisations, education, farm size, credit amount and ownership of radio are key drivers of farmers' awareness of SDG2. With the help of CMP econometric framework, households who are aware of SDG2 have food insecurity experience score of 0.74 less than their counterparts. Apart from awareness of SDG2, closeness of household to district capital, engagement in off-farm activities, small household sizes, training on crop production, large farm size and larger amount of credit receive decrease household food insecurity experience scale thereby making them more food secured. It is therefore prudent for stakeholders promoting and championing SDGs to educate farmers on the sustainable development goal 2 as their awareness of the goal is critical to achieving food security.

## Credit Access, Size and Participation in Sustainable Credit Activities: A Case Study of Vegetable and Pepper Sellers in Bere Market, Oyo State, Nigeria

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### **Abstract:**

For a sustainable agriculture to be achieved, credit and its accessibility is very essential. Credit is

one of the major inputs necessary for the adoption of superior marketing technology in Nigeria. However, there is inadequate information on credit access and participation of marketers in credit programmes. This study was therefore carried out to examine credit access, size and participation in sustainable credit activities among pepper and vegetable sellers in Bere market, Oyo state, Nigeria. The specific objectives of the study is to identify the socio-economic characteristics of the produce marketers in the study area, to determine the various types, constraint and sources of credit to vegetables and pepper sellers in the study area and to determine factors that drives participation of respondent in sustainable credit activities

Primary data was collected from 120 marketers randomly selected from Bere market Ibadan, Oyo state Nigeria using a semi-structured questionnaires. Data was collected on socio economic characteristics, credit access, source, size and constraints encountered in sustainable credit access. Descriptive statistics and Logit Regression were used to analyze the data.

Results of the analysis indicated that majority of the marketers were female. Findings revealed that 50% of the respondents had access to credit while 50% do not have access to credit. Majority of the respondents had access to credit from informal source with a lot of interest which made them find it difficult to pay back. Many of the produce sellers are not educated hence had little or no knowledge on credit access for a sustainable agriculture. Major constraints faced by marketers in their bid to obtain credit for their marketing activities were poverty level, difficulty in repayment as a result of low sales, interest rate on loans, lack of information on how to access credit and low level of education. Results of the logit regression revealed that gender, income, cost of accessing credit, purpose and time period, credit worthiness, flexibility and ease of obtaining credit were the significant factors driving participation of marketers in sustainable credit activities in the study area.

This study recommends a review of interest rate on loan and provision of information on credit facilities to improve participation of respondents in formal and informal sustainable credit activities

## The Sustainable Development Goals (SDG) in Paraguay: SDG targets interlinkages, development priorities and gaps

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**Abstract:**

The 2030 Agenda, with its 17 Sustainable Development Goals (SDGs), 169 targets and 232 indicators, has set an ambitious “plan of action for people, planet and prosperity” that must be achieved within 15 years (2015-2030). This first years of implementation of the SDGs by the 193 country members of the United Nations (UN), have served the international community to realize the complexity of the network of interactions (synergies and trade-off) between goals, targets and indicators, within a context where each country has set its priorities of development and those are not always aligned with the main objective of the 2030 Agenda (lack of policy coherence; policy vs politics). Paraguay is not the exception , and as a result of this situation, one of the main difficulties that the country will need to overcome is to understand the nature and impact (synergies and trade-offs) of the interlinkages between the different targets at the national level, considering the universal and integrated nature of the SDGs and that the decisions made by the country in a specific goal will necessarily have an effect (positive, negative or neutral) in the achievement of the others SDGs and in the probability as a country to accomplish the full 2030 Agenda.

The purpose of this study is to improve our understanding of the interlinkages between SDG targets in Paraguay through the use of a semi-quantitative methodology, based on a cross-impact analysis and an expert elicitation process. Moreover, in order to set the priorities of development of Paraguay in relation to the SDGs, we will use a multi-criteria analysis decisions framework according to the level of urgency, systemic impact and policy gap of the different SDG targets. The different analytical approaches used in this study are complementary and serve to the main objective of evaluating the SDG Paraguayan case.

Keywords: Sustainable Development Goals (SDGs), Policy Coherence, Policy Gap, Innovation.

## Assessment of Sustainable Urban Development in the Context of Geophysics

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**Abstract:**

Geophysics is one of the core elements of that is considered in urbanization, it started to take more attention when it comes to sustainable urban development since it is directly related to geophysical properties as well as subsurface investigation, environmental contamination and fate of hazardous substances. There is a crucial relationship between geophysics and sustainability, that should be used to improve environmental sustainability in cities. Thus, a sustainable metric system is created in this paper to assess the cities in the concept of sustainable urbanization by geophysical perspective by considering Sustainable Development

Goal 11: Sustainable Cities and Communities. The metric system can be used as a tool to assess the level of sustainability in urban development as well as to determine the areas that need to be developed. The tool was applied to selected mega cities; Istanbul and Ankara and a roadmap was created by considering regional characteristics, the results were presented in the study.

## Synergies, trade-offs and conflicts in urban programs – Implications for local SDG achievement

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### **Abstract:**

Achieving urban sustainable development requires explicitly taking into account the interactions (in the form of conflicts, synergies and trade-offs) between initiatives implemented at the local level. Taking into consideration those interactions is a key step to making robust decisions that address the three dimensions of sustainability, the social, environmental and economic. The city of Gothenburg in Sweden is used as a case study. The paper analyzes key programs of the city of Gothenburg with respect to the relation of individual programs to other programs as well as the interaction with SDG targets. The analysis highlights complex interactions between main initiatives that could contribute to achieving individual SDG targets but may support or limit progress on other targets. Analysis of SDG interactions are often limited to a binary of synergy/trade-off. This paper assesses SDGs interactions following a seven-point typology, which indicates the nature of the interaction of one target with others and whether the relationship is positive or negative. The typology ranges from 'indivisible' (where one objective is inextricably linked to the achievement of another goal), 'reinforcing', 'enabling', 'consistent', 'counteracting' and 'cancelling' (where progress in one goal makes it impossible to reach another goal). The research is based on an international transdisciplinary co-production research project on the localization of the SDGs to the urban level. The analysis highlights that while the city of Gothenburg has been working on the three dimensions of sustainability through various strategies and programs, the dimensions are often not addressed jointly, leading to conflicts and trade-offs and missing the opportunity of synergies. It also seeks to underscore the points at which an intervention would be more strategic, in the sense that it could contribute to generating progress on several issues. The systematic assessment can facilitate priority-setting in urban planning efforts linked with the implementation of the SDGs at the local level.

## Tradeoffs and Synergies of SDGs Related to Agriculture

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Eric Davidson, Professor, University of Maryland Center for Environmental Science

**Abstract:**

The 2030 Agenda for Sustainable Development, including 17 interconnected Sustainable Development Goals (SDGs) and 169 targets, is a plan of action for people, partnerships, and the planet. Sustainable agriculture is key to achieve SDGs through direct or indirect linkages. For example, SDG2 is directly linked with agriculture, which calls for action to move toward more sustainable and productive agriculture in order to end hunger. Agriculture is also highly related to poverty level (SDG1), gender equity (SDG5), decent work and economic growth (SDG8) in rural areas. In addition, clean water (SDG6), affordable and clean energy (SDG7), responsible consumption and production (SDG12), climate action (SDG13), and life on land (SDG 15) depend greatly on agriculture. Therefore, understanding linkages and needed partnerships and objectively measuring agricultural sustainability in each country is critical to achieve SDGS in 2030.

Based on the twenty indicators we developed for a sustainable agricultural matrix (SAM), we investigated the tradeoffs and synergies among those indicators, which measure the impacts of agriculture on the three pillars of sustainable development--environmental, economic and social. These indicators are well reflected with the actions in SDG1, 2, 5, 6, 7, 8, 12, 13 and 15 from the aspects of water quality and quantity, pollution, biodiversity loss, climate change, agricultural labor productivity, agricultural support, global market access, credit availability, farmers' risks, resilience, health and nutrition, rural poverty, rights and equity.

To investigate the tradeoffs and synergies among those indicators, we first aggregated the national-scale values into different country groups considering their economic levels, and then visualize the pairwise relationship for all indicators. We found that agricultural GDP per agricultural worker, one of the economic indicators, has tradeoffs with all environmental indicators, including groundwater depletion, blue water depletion, greenhouse gas emission, land use change, nitrogen and phosphorus surplus. These tradeoffs suggest that additional actions are needed to mitigate adverse impacts of agricultural production on environment in the process of agricultural development. In addition, among economic indicators, agricultural labor productivity, agricultural support, trade openness and farmers' credit availability have synergies, but negatively correlate with agricultural price volatility. Extremely large price volatility could be harmful to farmers' income and food security. Lastly, the majority of economic indicators have synergies with some social indicators, such as production diversity, food affordability, prevalence of undernourishment, and gender equality, and have tradeoffs with food self-sufficiency and obesity rate.

Analyzing the historical records of the SAM indicators by country groups reveals a general pattern of tradeoffs and synergies among SDGs related to agriculture. The implications of these findings need to be interpreted carefully for individual countries considering their different

socioeconomic (e.g., agricultural policy) and ecological (e.g., climate) conditions. China, India, Brazil, Indonesia and Malawi, as country cases of developing and less developed economies, will be investigated to recognize the unintended and perverse impacts of agricultural intensification on SDGs accompanying the rapid growth, and further provide insights into integrated, innovative and inclusive solutions and partnerships needed to address tradeoffs and mobilize synergies across agriculture with SDGs for the success of 2030 Agenda.

## Stakeholder and Community Engagement for Sustainable Urban Change

A Dream of open defecation free India? Decolonize and innovate urban sanitation to reach those left behind

**Submitter: Agrawal, Mahak**

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### **Abstract:**

Home to 15 per cent of the world's urban population, India accounts for 48 per cent of the global population defecating in open (UNICEF, WHO, 2014). As an end result of sanitation deprivation, open defecation has implications on the economy, tourism, public health, environment, education and safety. An action in this direction is, therefore, imperative for urban India.

Supporting Arguments:

1. Provision of a toilet- was, is and will never be enough.
2. Matters of shit, open defecation or sanitation deprivation is not confined to India or other "developing" nations.
3. India is home to the world's largest population of open defecators
4. Despite being a human right, sanitation deprivation and open defecation is a mundane reality of India. This form of deprivation is an indicator of poverty, and also a major factor contributing to poverty that is manifested spatially.
5. Access to adequate or any form of sanitation is still denied to many in India until a major outbreak is struck. Ad-hoc approach to managing the crisis is thence followed.
6. Spending millions from public funds on Centre, State, Local schemes remains futile as emphasis remains on the construction of the toilet.

7. Mere criticism of government or politics perpetuates an attitude of- "their problem, not mine!"

## A Dream of Open Defecation Free India? Decolonise and Innovate Urban Sanitation

**Submitter: Agrawal, Mahak**

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Urban Planner, Researcher- India, United Nations Sustainable Development Solutions Network Youth, India, mahak.agrawal@localpathways.org

### **Abstract:**

- Mission Statement: A Dream of open defecation free India? Decolonise and innovate urban sanitation to reach those left behind

- Problem: Sanitation Deprivation and consequent open defecation in India is a multifaceted challenge with implications on economy, environment, health and society.

- Supporting Argument:

1. India is home to the world's largest population of open defecators
2. Despite being a human right, sanitation deprivation and open defecation is a mundane reality of India. This form of deprivation is an indicator of poverty, and also a major factor contributing to poverty that manifests spatially
3. Access to adequate or any form of sanitation is still denied to many in India until a major outbreak is struck. Ad-hoc approach to managing the crisis is thence followed.
4. Spending millions from public funds on Centre, State, Local schemes remains futile as emphasis remains on the construction of the toilet.

### **Abstract**

Home to 15 per cent of the world's urban population, India accounts for 48 per cent of the global population defecating in open (UNICEF, WHO, 2014). As an end result of sanitation deprivation, open defecation has implications on the economy, tourism, public health, environment, education and safety. An action in this direction is, therefore, imperative for

urban India.

Content analysis of sanitation policies in the post- Independence India indicates that open defecation and urban sanitation in the country has been associated with several policies, agendas and efforts- running separately for rural and urban centres. The human right of adequate sanitation- associated with Universal Service Obligation is still a luxury which millions can't afford, and anyone concerned with its upkeep or cleanliness is linked with the notion of 'dirty'.

Critique of policy frameworks, missions and schemes aimed at addressing sanitation deprivation, also highlight that a large number of contemporary sectoral policies have a restrictive view of sanitation, especially with regards to 'open defecation'- the latter finds no mention in any policy framework, until the launch of Clean India Mission (or 'Swachh Bharat Mission') in October 2014. It is also evident that certain colonial practices and policies of social and spatial segregation that have persisted in Independent India, are critical in perpetuating sanitation deprivation. Gaps in urban sanitation chain and a 'crisis management' approach to deal with sanitation deprivation further aggravates the problem.

In the end, to eradicate open defecation from a society whose foundation is still influenced by Manu Smriti, and decades of social, physical segregation and accompanied psychological differentiation brought upon with the Sanitary Revolution in mid-19th century, sanitary foundations need to be dug deep and a radical change in the current approach is required- ensuring no one is left behind, through more equitable and environmentally sustainable interventions and innovations.

## Engaging Diverse Voices in Coastal Areas through Riskscape Mapping: Long Island as a Case Study

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### **Abstract:**

Long Island, New York is the largest island in the lower 48 states and the most populated in the United States with nearly eight million people. From the densely populated west end to the more sparsely populated east end, Long Island is particularly defined by its ethnic and socio-economic diversity with some of the wealthiest communities in the world along its shoreline and working class and minority communities in the interior. The island is perhaps ground zero for developed nations for the question of who will deal with the impacts of climate change and in what ways. The legacy of Superstorm Sandy is a spot-on example of this place-based risk assessment and who had access to FEMA funds, and to whom has returned to their residence



or moved on to locations away from potential coastal threats, etc. Riskscape maps were created to assess impacts from climate change and assess socio-economic demographics related to those affected in an attempt to predict outcomes for future storms of similar or greater magnitude. Geospatial maps were generated for visualization using Lidar imagery and Census Data for 1980, 1990, 2000, 2010, and the most recent projection prior to the 2020 Census to show changes over time for ethnic and socio-economic distribution, and diversity for the different physiographic regions of Long Island from the tip of Brooklyn to Montauk Point. Pre- and post-SuperStorm Sandy maps were generated to demarcate environmental justice issues related to climate change and where demographic changes occurred in terms of FEMA funding and relocation post-SuperStorm Sandy connected to ethnicity and household income. Projected storm surge maps for typical Category 1-5 hurricanes and for SuperStorm Sandy were created to get a better sense of where the most vulnerable communities to climate change exist on Long Island. Last, natural places at risk from climate change were assessed to think more critically about what we stand to lose regarding habitat structure (marshes, dunes, forests), functions (flood control, pollutant uptake, and energy production from primary producers), and values (recreational, economic, aesthetic, and educational). These “Risksapes” were ranked based on social, economic and natural resource vulnerability. By designating Riskscape indices, we can allow diverse voices agency for input in climate change conversations.

## Knowledge-based Sustainable Urban Area in India: TeaForSkill Model

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### **Abstract:**

India's is set to reap a demographic dividend over the next few decades, with almost 12 million people joining the workforce every year. However, many of those labours migrating to the urban areas remain unemployed due to skill gap. The World Bank in its report suggested that the only one in ten Indian workers have received any form of skill training. Additionally, almost 93% of the labour-force is in the unorganized sector while India's major export products come from industries in the organized sector including automobile, petroleum, machinery, etc. Though India government has come up with various initiatives and programs like Skill India, a government-owned corporation tasked to vocationally train Indian workers, the issue still remains ineffectively solved.

Our solution to the issue is TeaForSkill model. In India's urban areas, tea stalls are located everywhere and are a point where workers socially gather. This organic gathering of people

makes it an “uncalled” gathering. Due to this, we do not have to advertise for people to come, as it is already integrated into their daily life. We propose to utilize these tea stalls as information centres with additional features like WIFI and daily necessities. Within a-cup-of-tea time, workers can access information on jobs and skills trainings available. They can gather information online if they are smart phone users. For the non-smart phone users, the same content can be accessed through the posters on the wall. The skill information is provided by Skill India that is widely criticized for its ineffective delivery due to a large number of workers not being aware of its existence. The job information is provided by cooperation partners or any employers signing in our platform. In addition, the Model is also aiming at cooperating with existing skill trainers to offer skill-training MOOCs.

The model proposes to introduce the Social Impact Investment mechanism to India for financing the model and jointly addressing the issue with India government and independent investors.

As for the sustainability of the model, selling tea and local products can ensure the financial sustainability of the model. Data gathering and its analysing, and solar power application can sustain the model operationally. In addition, adapting the model and matching it with the local governments’ support policies can contribute towards effective functioning of the model.

## Analysis of Gaps and Deficiencies in Application of concept of "Stakeholder and Community Engagement" for sustainable change in communities: A case study of Northern Pakistan

### **Submitter: Farooq, Shamaila**

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### **Abstract:**

Stakeholder involvement and community engagement is a concept that plays a central role in bringing sustainability to the projects designed and executed for the betterment of society. Since the inception of the Millennium Development Goals of the United Nations, participatory approaches have been adopted and considered critical for the achievement of its set targets. Among other targets of MDGs, efforts were made in the past to achieve the Target-7C i.e

"ensure environmental sustainability; that by 2015, halve the population without sustainable access to safe drinking water and basic sanitation". Numerous community-based projects were executed to achieve this target during the specific time period. Nevertheless, continuity of this concept is still central to achieve the Sustainable Development Goals (SDG's) under the UN Agenda 2030 for sustainable development. The literature review based on past studies reveals that desired results of community engagement have not been achieved to an expected level under this target. The difficulty lies with a clear conceptualization of communal ownership which is often confused with citizen participation and ownership. Similarly, the capacity of communities is not properly gauged before handing over the serious tasks to the community-based institutions which fall short in measuring the real sustainable results.

These factors, if not addressed in time, may also result in the unsustainable achievement of SDG's, that may lead to the wastage of natural, human, and financial resources of local and global communities and stakeholders. Drawing on past studies, a study is conducted in the light of target 7C of the MDGs, and Goal 6 of the SDGs, both dealing with the sustainability of water and sanitation for all. This study is conducted based on existing literature (reports/papers) and fieldwork in Khyber Pakhtunkhwa (Northern province of Pakistan) where several community-based projects are implemented with the financial assistance of foreign donors. The study examines how community organizations work and find out their existing practices towards the sustainability of projects. The study aims to highlight gaps and deficiencies while gaining an understanding over the application of the concept of "stakeholder and community engagement" and present solutions to the local and global policy makers and decision makers to improve as well as accelerate the process for an effective stakeholder and community engagement to bring desired sustainable urban change.

## Big Data + Big Poverty Alleviation: China's Precisely Targeted Poverty Alleviation — A Case Study on Guizhou Province

**Submitter: Hao, Nan**

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### **Abstract:**

"No Poverty" is the very first goal of United Nations Sustainable Development Goals. Contributing most to poverty reduction of United Nations Millennium Development Goals, China kept its pace in the course by launching a new movement named "Precisely Targeted Poverty Alleviation". Performing notably in the movement, Guizhou province, with the largest poor population in China, innovatively combined frontline technology with poverty alleviation. Applying big data and cloud computing, Guizhou province has built a cloud platform to connect

all 17 relevant government agencies' data, so as to precisely target poor population. The government are therefore able to precisely and effectively grant favorable policies and fee-waiving on verified poor households. Integrating with e-commerce, Guizhou government can coordinate its poor agriculture population to farm most needed crops that can be sold out from the mountainous province to nationwide market through e-commerce orders. Holding Big Data Expo, Guizhou government is trying its best to bring in high-tech companies to run business and join its efforts to alleviate poverty. Though the Guizhou model still faces several challenges and problems, this pioneering practice has been widely recognized by China and various other countries and international organizations. The practice is also worth being learned and adapted by other poor areas and countries.

## Community Benefits Agreement: A potent tool to empower vulnerable urban communities to manage the impacts of gentrification

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### **Additional Authors:**

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### **Abstract:**

The problem of congestion and pollution in cities is addressed through variety of urban greening interventions. This is expected not only to maintain precarious ecological balance but also to protect public health. Research acknowledges the impact of the green cover on physical activity, mortality, and obesity. Its effect on mental health as well as behavioral problems is also noteworthy. However, overall effect on urban greening has been impacting the low-income households and communities of color. With positive effects brought about by the urban greening, neighborhoods become attractive increasing the housing costs. This leads to gentrification by displacement and/or exclusion of disadvantaged communities for whom greening was also supposed to benefit. Gentrification is seen as the class remake of the urban landscape and considered to be one of the most important processes reshaping contemporary cities. Due to higher housing cost and rent, the communities may be forced to leave their habitat, and again shift to place which might have similar park-poverty problems. Thus, urban greening interventions which on one side intend towards environmental, social, and socio-economic benefits by doing park investment, greenways, ecological corridors are simultaneously creating inequality, exclusion, polarization of already socio-economically non-privileged class.

According to scholarly articles, the issue of gentrification seems to have ascended because urban greening is only seen as a technical intervention to address public health, and beautification overlooking the social disparities it might create. Generally, low-income and

communities of color are in vulnerable situation and unorganized state due to their precarious life conditions. Taking advantage of their situations, the decisions are taken by the authorities affecting impoverished neighborhoods, compromising the basic principles of justice and equity. First part of our paper attempts to analyse effect of urban greening interventions on gentrification through qualitative research methodology.

Sustainable Development Goal 11 talks about making cities and human settlements inclusive, safe, resilient, and sustainable. Target 11.3 highlights the importance of participatory, integrated and sustainable human settlement planning and management to achieve Goal 11. One of the most promising approach to balance benefits of urban greening without adversely affecting gentrification is 'just enough gentrification'. The Greenpoint community in Brooklyn, New York exemplifies the collaboration between local working-class community and planners demanding environmentally cleanup strategies for industrial use and preservation of work for working class, explicitly avoiding typical mode comprising of park, cafes and a riverwalk. One of the ways to ensure community participation during the planning is to have a Community Benefits Agreement (CBA). A Community Benefits Agreement (CBA) is a project-specific agreement between a developer and a broad community coalition that details the project's contributions to the community and ensures community support for the project. CBAs offers a win-win approach to development: up-front communication between the developer and a broad community coalition decreasing developers' risk while maximizing the positive impact of development on residents and economies. Our paper discusses the evolution of CBA and its impact in addressing the issue of gentrification in the cities of Atlanta and Minneapolis from Georgia and Minnesota states respectively. We argue that CBA is one of the most potent tools to ensure highest level of community participation for successful transition of families, growth of economy, and sustainable use of natural resources.

## Political Factors Affecting Community Development in Botswana

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### **Abstract:**

Despite their dynamic state, Politics play a vital role in championing community development in any society more especially in democratic and stable countries like Botswana. Since 1966, Community Development has been used in Botswana to mobilize people and issue out developments in communities with the aim to build capacity among local people so that they can work together to improve their social and economic conditions. Politics provides the crucial frame work for community development because unlike other aspects, they of govern the entire system of community development and society transformation. That is to say economic growth of communities and political stability are interdependent or they rely on each other therefore one cannot occur without the other. Despite Hence this paper seeks to examine the extent to which Political factors have influenced the current state of community development in Botswana. In order to scrutinize this, the paper will focus on issues of political leadership,

challenges and opportunities presented by the current political state of Botswana with regard to CD (corruption and political will) and lastly how has modern politics incorporated community development in Botswana. Evidence from different Scholars indicate that the African continent endowed with resources and yet it failed to transform, in part because of bad political leadership in most countries. Botswana has been an exception to a certain extent hence it is imperative that we study this issue in detail to demonstrate that sound political will can make a difference in developing communities.

## Collaborating with Local Small Business Owners and Stakeholders for Sustainable Development in Playa del Carmen, Mexico

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### **Abstract:**

About an hour away from Cancun, Mexico, Playa del Carmen is currently a blooming tourist area. While many big brand businesses have moved in and boosted the economy, this expansion presents multiple challenges for local small business owners and overall employment. This paper will first assess the conflict this development creates for the local community and the ways this economic growth does not promote sustainable development. Secondly, this paper will look into current labor union policies in the area to better understand whether current workers are protected and supported by the drastic development. Furthermore, this case study will present suggestions on how the government can better collaborate with local stakeholders, as well as local small business owners, to improve the current development in a more sustainable way that supports both businesses and individuals.

## Achieving Sustainable Community in a Diverse Socio Economic Neighborhoods

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### **Abstract:**

Communities in Syracuse, Central New York has two faces. It boasts affordable housing and living, along with that comes aging housing stock and unsafe neighborhoods. Not only half of the housing stock was constructed in 1939 or earlier, but many households and residents also suffer from severe housing problems such as inadequate plumbing. Insufficient housing resulted in vacant residential property leaving neighborhoods to deteriorate. Disparities inadequate and quality affordable and sustainable housing resulted in growing concerns for safety, wellness, healthcare, education, and economic development to achieve healthy neighborhoods. Lack of employment and economic opportunities resulted in vacant commercial spaces and empty streets. Since 2000, Syracuse has been listed as one of the highest concentrated poverty in the nation with its highest living under the federal poverty line in 2015. What does this mean to the residents? Unfortunately, often vital public improvements

are likely to be underprovided or time consuming for the policymakers to channel funds. The good news is that although faced with challenges, many pockets of the neighborhood are being rehabilitated, attracting different organizations intent on improving the economic opportunities and are working to return the neighborhood to the vibrant place. This paper focuses on the Northside Neighborhood, a diverse socio-economic area in Syracuse, NY where the high concentrated poverty occurs. This paper describes various rehabilitation efforts including women's fitness center, pockets of green spaces, affordable housing by local organizations and stakeholders, and sustainability initiatives by local non-profit housing developers to alleviate negative impacts. Community-led conversations with residents, community partners, and stakeholders are discussed to address leading concerns and innovative ideas to achieve healthy and sustainable community including diversity, accessibility, and safety. Lastly, this paper posits that active community engagements and involvements would promote positive urban changes that respond to diverse demographics and achieve a sustainable community that eventually leads to generational issues impacting their children, education, and health, bringing life-long effects.

## Urban India's Stride towards Cleanliness

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### **Abstract:**

Maintaining cleanliness in city is one of the major challenges faced by the urban areas in most of the developing countries and emerging economies. With about 55% of the global population living in urban areas in 2018, and the number estimated to rise as much as 68% by 2050 (United Nations Department of Economic and Social Affairs, 2018), optimum urban management is crucial for the sustainable development.

The quest for a better income and standard of living is the major reason for migration towards urban areas in India. However, this increases the population density, which escalate the waste and sanitation problems.

India had Solid Waste Management Rules (2000), as the first document intended to tackle the waste management problem, which was further revised in 2016. These rules gave defined the responsibility of the stakeholders, penalties involved, and regular documentation of the quantification of the waste generated and the abidance of the States to these rules.

Two major government initiatives are major highlights in India's strive towards cleanliness. As described in (Ministry of Housing and Urban Affairs - Government of India, n.d.), on 2nd October 2014, the Government initiated the Swachh Bharat Mission (SBM, Clean India Mission). A target was set to have an Open Defecation Free (ODF) India, with 100 % door-to-door waste collection and scientific waste management until Mahatma Gandhi's 150th birthday on 2nd October 2019.

Although, SBM came into existence prior to the launch of Sustainable Development Goals (SDG) in 2015, it is aligned with the SDGs 3, 6, 11, 13, 14 and 15.

In order to evaluate the success of SBM, in 2016 Government of India initiated a Swachh Survekshan (SS, Cleanliness Survey) on two different levels: urban and rural. In the SS-Urban, the cities were encouraged to compete based on their cleanliness and sanitation levels.

The major driving force was that a competition in between the cities would lead to increased awareness among the citizens. As stated by the (Ministry of Urban Development (SS\_2016), 2016), the survey was born out of the knowledge that, “What gets measured gets done” and “Competition makes us strive to be better”, which would trigger a reform-driven, participatory, and multi-stakeholder process.

With 73 cities competing in 2016 (Ministry of Urban Development (SS\_2016), 2016), it encompassed the 4237 Indian cities by 2019, and was proclaimed as the world’s largest cleanliness drive (Ministry of Urban Development (SS\_2019), 2019).

The journey was progress driven, and arguably evaluating numerous factors regarding the sanitation and cleanliness levels in the Urban India. The cities underwent considerable development in the wake of these competitions.

Thus, a government initiative stimulated the stakeholder participation in fighting against the waste and sanitation challenge. Whether the target pledged by the government was achieved, is a different discussion. What is of essence here is the amount of awareness and the sense of responsibility created among the citizens, who are the major stakeholders. In addition, several reforms at state level took place with an aim of making the cities win the competition.

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## The Tale of Sustainable Scrooge: A Christmas Carol in Santiago de Chile

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**Abstract:**

On the night of Christmas eve, Santiago de Chile - also known as Scrooge - is visited by the ghost of his old business partner Marlay - also known as Urbanocene - who offers him a chance to escape the fate of unsustainable cities. This night, he will be haunted by three spirits - Augusto, Claudio, and Salvador - with whom he will visit his past, present, and future. He must listen or be damned to carry the chains of unsustainability for eternity...

Neatly nestled in the fertile central valley of Chile - between the coastal Pacific Coastal Range to the west and the Andes Mountains to the east - the Metropolitan Area of Santiago de Chile (MAS) represents the country's economic and political capital, as well as one of the largest and most dominant metropolis in Latin America (Romero et. al. 2012). The MAS covers 15,403 Km<sup>2</sup>, produces nearly 40% of Chile's GDP, and is home to a population of more than 7 million people; almost 40% of the country's total (Sagaris and de Dios Ortuzar 2015, National Institute of Statistics 2017).

Santiago has experienced enormous changes in recent times, including mass rural migration and urban segregation mainly due to authoritarian and neoliberal policies undertaken during the 1980's by Augusto Pinochet's dictatorial regime (Romero et. al. 2012; Sagaris and de Dios Ortuzar 2015); and, similar to other megacities around the world, Santiago is facing several challenges that threaten the well-being of its citizenship. Mainly, congested roads and inefficient public transport are seriously affecting air quality; the city is experiencing periodic floods; waste management, water scarcity and clean energy remain crucial challenges for the future; poor and fragmented governance results in poor urban planning and urban segregation; and civil society lacks the bargaining power required to infiltrate the urban initiatives from which it is so often excluded (Krellenberg et al. 2010; Romero et al. 2012; Sagaris and de Dios Ortuzar 2015; Valdes et al. 2012).

In this paper, two crucial and interconnected challenges are discussed in detail: the issues of mobility and energy. The novella A Christmas Carol by Charles Dickens - first published in 1843 - is the narrative through which these challenges are described and discussed. The main

character, Ebenezer Scrooge (i.e. Santiago de Chile), is offered the chance to change his future by his former business partner, Jacob Marley (i.e. Urbanocene). During the night, Scrooge is visited by three ghosts who show him his past, present and future; offering him the opportunity to redeem himself. In the same way, Santiago will be visited by three ghosts and presented with the possibility of becoming a sustainable city.

In the first section of the paper, Augusto - the ghost of Santiago past - will discuss the history of the city, focusing on the neoliberal paradigm that impacted on its development. In the second section, Claudio - the ghost of Santiago present - will focus on two current challenges that the city is facing, namely mobility and energy. The challenges are presented, and the main initiatives undertaken to solve these problems - both locally and globally - are discussed. In the third section, Salvador - the ghost of Santiago future - illustrates the way forward, providing recommendations for the city to be sustainable, as well as the limitations it faces to do so. Finally, the concluding section provides an overview of the key learnings garnered from The Tale of Sustainable Scrooge: A Christmas Carol in Santiago de Chile.

## Cultural sustainability and Adventure Sports Tourism: an empirical study of paragliding tourism in Pokhara, Nepal

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### **Abstract:**

The phenomenon of cultural sustainability has two distinct variables namely; culture and principle of sustainability. These two phenomena are directly proportional to each other, given that to sustain the cultural values, certain principles and approaches are need, which varies from one culture to another across the world. From the definition point of view, Cultural sustainability is integrated and multidisciplinary principles as well as approaches recognized and initiated to meet current human needs without indulging the position of the future generations to meet their own needs (Soini and Birkeland, 2014). The value of adventure sports tourism in cultural sustainability newly debated phenomenon. This study employs ethnographic methods to identify the situation of community collaboration and role of stakeholders in Pokhara paragliding tourism and its effects on cultural sustainability. Although paragliding has been identified as a popular tourism product in Pokhara, findings indicate mix impact on cultural sustainability. Paragliding takeoff and landing zones are closed to downtown in Pokhara city and adjacent communities in paragliders takeoff and landing zones have strong ecological and cultural diversity which has found marketing as tourism brand along with paragliding. Cultural authenticity can be experienced by paragliders through homestays, cultural tableau, music & dance, and other cultural artifacts. However, democratic practice on decision making through stakeholders' interaction, cooperation and equal participation need to increase maximum.

Rural-urban integration and social cohesion can be achieved by valuing indigenous existence which is the core element needed to foster for cultural sustainability. Further, education, media and museums are rarely touched part by adventure sports tourism. Arts and crafts education, youth participation and knowledge transformation programs are highly required for the sustainability of their culture. Research findings suggests that adventure sports tourism can be leveraged in Pokhara for sustainable development by promoting authentic cultural value, democratic integration of community residents and other stakeholders in tourism planning and decision making process and educating the local on various potentials that have to absorb from the tourism industry for socio-cultural, economic and environmental sustainability

Keywords: Cultural sustainability, Tourism, Pokhara, Collaboration, stakeholders

## Application of a Combined SWOT-AHP: Determining Stakeholder Perceptions of New Jersey's LSRP Program for Strategic Planning

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### **Abstract:**

In order to develop sustainable cities, two sources of urban environmental degradation need to be identified and controlled. The first being current activities which can include ongoing manufacturing process, poor air quality from the transportation sector, and improper waste disposal. These types of potential ongoing degradation can be controlled by ordinances on a local level. The second is the more difficult to control degradation generated from past activities that have create sites that are typically vacant properties with potential contaminations. These contaminated sites are costlier to clean, develop, outside of local level control, and interfere with holistic city planning. They require a more comprehensive remediation programs, which in most cases unless the local government have adequate resources and funding needs to occur on a state level. In 2009 with more than 20,000 open remediation sites, the densely populated State of New Jersey established the Site Remediation Reform Act (SRRRA). SRRRA created an affirmative obligation for responsible parties to remediate contaminated sites within regulated timeframes and the Licensed Site Remediation Professions (LSRP) program. This created a large paradigm shift in the way remediations were being managed. The LSRP program created a licensure process and shifted the responsibilities of New Jersey Department of Environmental Protection (NJDEP) Site Remediation Case Managers to board licensed private individuals. The LSRP are able to provide remediation services without delayed approval from the NJDEP. This allows for timelier site remediations that are protective of human and safety and the environment. In turn, generating prompt development of contaminated properties. Ten years after its passage, the program has matured and SRRRA 2.0 is being developed. To assist in SRRRA 2.0 strategic development, a modified Strength, Weakness, Opportunities and Threats - Analytical Hierarch Process (SWOT-AHP) has been applied to four stakeholder groups to assess each groups' preferences regarding the current LSRP program. The groups include government and legal entities, business and trade organizations, non-

government organizations, and the LSRPs. The local outcomes of the perception findings can assist state regulators in identifying needed program modifications. While on a greater scale, the analysis can assist states struggling with timelier remediation of contaminated properties and develop their own privatized site remediation programs. By allowing quicker remediations of properties in urban cities, the direct stress placed on economic, social and environmental factors are reduced, in turn creating more sustainable cities and indirectly reducing the degradation of external urban areas known as “Sprawl”.

## Sustainable Development in Indigenous People’s Revival: An Analysis of its application by the Indigenous Smangus Tribe’s Struggle in Taiwan.

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### **Abstract:**

Community development is seen as a crucial factor in the realization of Sustainable Development Goals as part of a wider 2030 agenda for sustainable Development built on the success of the Millennium Development Goals (MDGs). The SDG is unique as it called for action by all countries, poor, rich and middle income to promote prosperity while protecting the planet, for indigenous peoples in particular due to their close associations with nature and natural resources. They however, devised a means of development for themselves since historical exploitation of indigenous peoples has resulted in their underdevelopment worldwide. Drawing upon Michel Foucault’s notion of the power-knowledge relationship, this article presents a case study of an indigenous tribe, the Smangus in Taiwan, to illustrate how a politically, socially and economically disadvantaged community incorporated traditional norms and customs into the notion of sustainable development and interpreted same for adaptation into the community’s conditions. This was achieved by re-uniting the community and establishing a cooperative organization, the community has revived cohesion in their community—the article illustrates how it fulfilled three Targets and the extent to which they were fulfilled. In conclusion, the Smangus’ case reminds us of the importance of achieving sustainable development goals on micro- and local levels, and the value of empowering local communities to pursue their own sustainable development goals according to their circumstances. The secondary means of data collection was adopted. This article recommends for future research, and suggests that more studies using such a bottom-up approach to sustainable development would help to accumulate knowledge and experiences to establish a pattern of success to help other disadvantaged communities, draw focus to the need to bridge the policy gaps between the United Nations and local communities, and recall attention to the role of micro- and local communities to achieve sustainable development goals.

**Keywords:** sustainable development; sustainable development goals; community development;

Indigenous people

## Effective and participatory decision-making through the lens of community productivity

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### **Abstract:**

In this presentation, I will introduce my research on the concept of community productivity as an emerging theory on sustainable community development (SCD) that has the potential to empower local governments and their citizens to deal with multiple issues in a participatory and holistic way. I will argue that achieving SCD is possible through increased multi-factor productivity and I will explain how enhancing multiple forms of community capital can contribute to participatory decision-making and community well-being.

The concept of productivity is mostly associated with economic and other resources, but it is in fact multi-dimensional in the same way as sustainability and it is grounded in strong sustainability principles and systems thinking. A full productivity potential can only be achieved through a holistic approach which integrates economic, social, and environmental factors, and their interconnections. Theory and practice of circular economy, social and sharing economy, resource regeneration, ecological productivity, social equity, environmental equality, resilience, and other concepts can be applied.

Developing a productive community involves a transition from a negative individualistic logic (reducing impact, mitigating externalities) to a positive systemic one (regeneration of all types of resources). During this transition, community, people, and environment would not only coexist but they would be engaged in a co-evolutionary process to reclaim the urban commons and enhance the sense of community and social connection. This requires fundamental changes to the status quo to stop “sustaining” an ill-functioning – and thus unsustainable – system and business-as-usual operations, in favour of achieving meaningful improvements to community well-being.

Based on my research, I propose a community productivity framework that allows for contextual analysis and adaptable solutions while engaging diverse stakeholders. Collaborative decision-making can help achieve societal change; the concept of regenerative sustainability emphasizes the need for processes of collaborative planning and participatory backcasting to ensure that all partners’ perspectives are considered, including that of the natural environment and its intrinsic value. Productive community development can lead to stronger human and social capital, improved community assets performance, ecological function regeneration, effective and inclusive decision-making processes, and overall community well-being.

## Developing Platforms for Facilitated Networking Between Students and Local NGOs

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**Abstract:**

Interdisciplinary Perspectives on International Development (IPID) is a graduate student organization at the University of Minnesota, Twin Cities. Our organization works to bring together students and professionals from local NGOs interested in addressing domestic and global development challenges. We have seen that facilitated interaction between students and professionals is imperative to forming strong cross-organizational networks in the Twin Cities metropolitan area. IPID works to provide appropriate platforms for students and NGOs to facilitate long-standing connections and engage in meaningful discussion and debate. We believe that these first connections between students and NGOs creates a network of relationships that strengthens the Twin Cities community and those who are working to enact positive social change both within and outside the metro region. IPID engages students from across the university and has members from the School of Public Affairs, School of Comparative and International Education, School of Public Health, and the Interdisciplinary Center for the Study of Global Change.

IPID is currently assessing the types of platforms that work well for facilitated networking while also forming strategic partnerships with local NGOs. During the 2018-2019 school year, IPID has hosted a range of networking events such as panel discussions, a research symposium, personal development workshops, and many informal social hours with graduate research presentations. IPID is also continuously working to establish official sponsored relationships with local NGOs allowing for more streamlined communications. These two efforts have created a preliminary recipe for successful networking while working around varying member schedules, interests and time constraints.

The process of refining our networking platforms is ongoing. Our aim is to present the methods used to create these platforms and evaluate which tools have worked and others which have not in regard to facilitated networking. We seek to share this knowledge to develop a community of best practice around successful network development between university students and NGOs. Bringing people together who are motivated to make positive change is vital to our community's future.

## Linkage of urban climate governance scales: Comparing resilience frameworks within the greater Philadelphia metropolitan area

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### **Abstract:**

The aim of my present master's thesis research (completed by: September 27, 2019) is to assess the risk management approaches for two urban county governments in Pennsylvania - and to explore whether comparing preparedness for climate resilience between two counties of one metropolitan area (i.e., Philadelphia and Delaware Counties) reveals opportunities and limitations in regional coordination to achieve SDG targets. This research expands on recent studies by integrating climate risk explicitly into stakeholder interviews, and by comparing multiple counties of a greater metropolitan area for the first time among peer studies.

I am presently conducting semi-structured interviews with stakeholders based on an existing research framework in order to identify Philadelphia and Delaware County's current climate action regimes. This resilience-based framework has been used in half a dozen studies since 2016, led by Dr. Bill Solecki (Professor, CUNY) and Dr. Mark Pelling (Professor, King's College London). These researchers have identified four recurring urban management regimes: collapse, resistance, resilience, and transformation. Their framework also identifies a number of additional characteristics of a given urban government: development pathways (history and context), activity spheres (governance scales), activity spaces (technology, livelihoods, institutions, and others), and drivers (actors and conditions).

My interview participants are stakeholders and experts in policymaking within their respective counties, and represent government, academia, private industry, and civil society. As with previous studies, my interviews assess the stakeholders' views on the importance of various urban risks (e.g., heatwave, flooding, fire, etc.) and how they believe their county is prioritizing those risks. I also ask them about the factors (e.g., population demographics, management capacity, national political priorities, etc.) that led to their county's risk prioritization. Further questions serve the purpose of identifying the local government's current risk management approach, and aim to identify any possible directions of change. Finally, and distinctly from previous research, participants are asked about their more specific assessment of their county's approach to climate risk.

Stakeholders in Philadelphia and Delaware Counties presently have limited day-to-day coordination between them, especially when it comes to climate action planning. Importantly, a regional body exists - the Delaware Valley Regional Planning Commission (DVRPC; comprising 9 counties in PA and NJ) - that has increasingly focused its resources on energy and climate



change initiatives. Nevertheless, my interviews of local stakeholders and analysis of county-specific planning documents reveal little awareness of reports, inventories, and funding offered by the DVRPC. Local governments in the greater Philadelphia area would do well to better acknowledge their climate-related connections and dependencies at various scales. Using the Philadelphia metropolitan region as a case study, I present how good climate action planning necessarily challenges the traditional boundaries of municipal and county jurisdiction. Future research will need to further grapple with these governance implications if we are to, as the recent IPCC SR15 calls for, transform society to achieve the SDGs and a climate-resilient world (SR15 FAQ, p. 24).

## The Housing First Model in New Zealand: A Permanent Solution to Sustainable Urban Development

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### **Abstract:**

It is a universally declared human right that all individuals have a standard of living, including housing, that promotes health and well-being. This is further recognized as the eleventh United Nations Sustainable Development Goal: “Make cities and human settlements inclusive, safe, resilient, and sustainable”. Successful in Canada, the USA, Europe, the United Kingdom and now in Hamilton New Zealand, the Housing First model recognises that it is easier for people to experience dramatic improvements to their lives once they are housed. The priority is to quickly move people into appropriate housing and then immediately provide wrap-around services to support their success. The goal of Housing First is to end homelessness - not to manage it. The evidence tells us that access to permanent housing works best, but emergency housing plays an important role in the housing continuum for some people before they are able to enter a Housing First service. It is particularly important when people are in crisis so that stakeholders can respond to their needs immediately by keeping them safe and off the street. In New Zealand, The Housing First collective is working closely with emergency housing providers so that they can support people through the housing continuum. But it is important that people do not get stuck in emergency housing – its purpose is a short-term response before people can move on to sustainable, permanent housing, with support. In Auckland, where there is a housing shortage, there will be a need for emergency housing services for some time to come as part of a whole system approach. The Auckland City Centre Housing First Programme is a partnership between Auckland City Mission and Lifewise for people experiencing chronic homelessness in the Auckland city centre. The two organisations are drawn together by common values and a shared commitment to end homelessness. Lifewise understands that in order to be effective, housing must be a collective endeavour with stakeholder and community engagement. Lifewise’s programme has a strong kaupapa Māori approach and includes the voice of Tangata Whenua and the “rough sleeper” community. They work alongside partners



from Auckland Council, Ministry of Social Development, Housing New Zealand, DHBs, Iwi and other NGOs. This poster presentation will outline an evaluation of the Housing First Program in Auckland, demonstrating the program's efficacy, successes, and opportunities for improvement in providing rights-based, community-led housing that fundamentally seeks to improve community members' health and wellbeing by providing life-changing housing.

## The Relationship between Allocation of Urban Public Facilities and Spatial Fluctuation of Housing Prices

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### **Abstract:**

The quantity and quality of urban public facilities are significantly different in spatial distribution, making the accessibility and availability of some facilities have a serious stake in the location or property rights of real estate, which leads to conflicts in the housing market, resulting in spatial fluctuation of housing prices. Therefore, this paper argues that the capitalization effect of urban public facilities is related to the type and its supply level, which determine the size of service population and service scope of facilities; the difference in facilities allocation will cause spatial inequality in housing price in neighborhoods within the sub-district. This paper presents a theoretical framework of the relationship between urban public facilities supply and its capitalization effect, and the variation of housing prices. The validity and rationality of framework are verified by a case study and previous scholars' research. It is found that the uneven supply of facilities and the unbalanced distribution of quality resources have a significant impact on the spatial fluctuation of housing prices. Among them, (1) the facilities laid out according to smaller administrative units, with smaller service radius, relatively fewer service population and relatively fixed location, are the basic needs of people, their capitalization effect is not significant and their supply density has a negative impact on the variation of housing prices. (2) Facilities laid out according to larger administrative units, with larger service population, wider service scope of services and relatively semi-fixed or not fixed location, are belong to people's higher-level needs, their capitalization effect is significant and their supply density have a positive impact on the spatial inequality of housing prices. (3) The scarcity of quality public resources, which belong to people's higher-level needs, whose capitalization effect is significant and their existence will intensify the spatial fluctuation of housing prices.

## The Role of National and Transnational Knowledge Cooperation in the Implementation of the SDGs

Employing cross-country partnerships to sustain forest landscapes in Ghana and Indonesia

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**Abstract:**

Despite governments' interventions to restore forest cover, primary forests in Ghana and Indonesia have been decreasing remarkably for decades. We obtained data from the forestry sector of Ghana and Indonesia to examine the practices that go on within the forest landscapes, the roles and activities of the stakeholders of the forest landscapes, and the influence of the stakeholders on the restoration and sustainability of the forests in the two countries. We used SWOT analysis to examine the forestry sector of Ghana and Indonesia and draw a comprehensive framework for sustainable forestry for the two countries. Our preliminary findings indicate that within most protected forest reserves in Ghana, there are admitted farms and settlements with no clear boundaries and management plans to control expansion into the forests. This has resulted in conflicts about ownership of forestlands, and management and control of forest within this complex landscape. In Indonesia, sustainable forestry is a vicious circle of prioritization game. Indonesia is the fifth most populated country with its 275 million peoples to feed. Forest land entitlement in Indonesia are contested among the Ministries of Forestry, Agriculture, Mining and Land Agency for forest conservation, agricultural production, mining and housing needs, respectively. These complex arrangements have led to excessive deforestation since bureaucracies are bypassed illegally to secure forestland titles. Effective monitoring and evaluation of forestland entitlement is absent since Indonesia is also struggling to connect its 13,000 plus islands spatially and administratively. Poor coordination among stakeholders has resulted in overlapping inter-sectoral regulations. Sustaining forests in Ghana and Indonesia requires an all-inclusive collaborative approach to coherent national and international forest governance.

**Foreign Trade Policy Analysis: What factors restrict the less developed countries to achieve the Pareto Efficiency Frontier in Economic development while conducting trade and business agreements with developed countries?**

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**Abstract:**

Bilateral and/or multilateral trade and business agreements are important socioeconomic growth factors in the less developed and low-income countries to ensure all-inclusive development and reduce income inequality in their population. Unfortunately, the less developed and low-income countries often fail to get an equal place in these trade and business

agreements due to the intersection of power disparity and fear of jeopardizing the probable future support from the developed and more powerful countries. This economic phenomenon results in an increased marginality of these less developed countries. Recent economic analyses and research studies show that both financial development and economic growth in less developed countries in South Asia are more successful compared to other less developed countries in other parts of the world. Economists and researchers attributed this sustainable socioeconomic growth to appropriate resource allocation, adopting more flexible market policies and right price strategies (R. Wade 1992; Bist and Read 2018).

In this paper, while reviewing, investigating, and comparing the works of Wade (1992); Ozden (2003); and Bist and Read (2018); I argue that despite the collaborative efforts and policies from the world organizations and developed countries, the developing countries still face significant difficulties due to their economic status while conducting transnational trade and business with developed countries and often fail to attain mutually beneficial terms and agreements. I also reviewed several other reports and economic analysis reports which outline a similar trend and pattern between bi and multilateral business agreements where less developed countries systematically failed to attain equal space in the negotiation table. Wade (2018) argues that developed countries and world organizations collectively need to address this issue and develop a sustainable framework that ensures equal and equity-based participation from less developing countries, and this will ensure collective and sustainable global socioeconomic growth.

## The challenges of cultural inclusion and cooperation in international water projects

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### **Abstract:**

Connecting with communities is crucial to change people's behavior to a more sustainable lifestyle, especially in water projects in developing economy countries. However, there are many challenges when working to integrate the culture of a community into a project designed by an international organization with a different cultural background. While the terminology of many international water projects has been changed to 'cooperation' rather than 'aid', projects on the ground still lack cultural inclusion, with often fatal consequences.

A sustainable project needs to be owned by the community and the purpose well understood by every stakeholder. International donors have an altruistic aim to empower communities to help themselves through water projects. Therefore, there is a range of approaches that are used to design projects after an on-the-ground examination. Approaches now include community consultation and various assessments, and terminology has been changed to cooperation rather than aid. But is this altruistic aim actually practiced in the field and how can the culture and traditions of the target communities be involved in the project design? Findings from two different country contexts are presented to understand a social and anthropological

process that may have the potential to influence the long-term outcomes of attempts to achieve the sustainable development goals (SDGs).

## Green Hub: Costa Rica's contribution to a global green economy

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### **Abstract:**

Over the last 25 years, Costa Rica has become a vast breathing laboratory that has served as a hub for research, innovation and thought on environmental affairs. The country is a global reference for sustainable development and has achieved sound accomplishments such as: i. recovery of forest cover: from less than 30% during the 80s to 52% of the nation's territory today, ii. design of legal and technical tools that put in place Payment of Environmental Services Programs, iii. establishment of the first mechanism in the world for a global transaction on carbon emission reductions, iv. set up a robust natural protected area system: 25% of the territory, v. and, last but not least, 99% of electricity produced comes from renewable sources: hydro, geothermal, wind, biomass and solar.

These achievements have transformed our country of 5 million inhabitants into one of the most important green destinations in the world (2.5 million tourists a year). At a decisive moment for mankind, in which all parties share the awareness of the need for a paradigm shift in development, Costa Rica accepts its global responsibility. The country has decided to shape up innovative global programs that allow for knowledge generation and sharing of lessons learned through strategic and creative joint ventures. A small country in size but big in ambition, it can serve as unique hotspot for innovation, aiming to lead by example and contribute decisively to the planet, building upon their experience to help foster conditions for a green economy proposition.

To enhance this opportunity, with support from the Government of Costa Rica, and local think tank named Fundecor has been developing and promoting the Green Hub as a formal mechanism, generating pragmatic solutions, appropriate information management and technology transfer to other countries as a means to consolidate the country's "green economy" model.

The Green Hub is a knowledge management initiative that organizes, generates and provides information and knowledge based on environmental management experiences, financial mechanisms for sustainability and technical prototypes. It aims to facilitate the rapprochement between cultures, social and economic sectors, managers and users in an agile manner fostering the use of technology, linking decision making with information needs, all with the objective of creating added value from sustainability solutions tested on the ground, but globally replicable.

## The Role of National and Transnational Knowledge Cooperation in the Implementation of the SDGs: The case of Smartly, Social Entrepreneurship on the SDGs

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Evangelina Colli, Associate and Expert in Localization of Public Policies on the SDGs, and Coordinator of the Secretariat of the Local Parliaments Network on the SDGs- Buenos Aires.

**Abstract:**

With globalization, a new international order of economic, political, social and cultural influence began to take place across Western and Eastern societies, gradually filling the knowledge gap that existed until then between the developed and developing countries.

In the last few years we have noticed the proliferation of non-state local actors, non-governmental organizations, transcending borders and facilitating the flow of information and knowledge: also known as transnational actors. In this regard, globalization has allowed people to act “Glocally”, acting locally while thinking globally. It involves a process of transnationalization of politics, where social entrepreneurs and activists have the opportunity to magnify their impact; working within a network and benefiting from the inputs of knowledge, generated locally and adapted globally, as well as universal knowledge, like the SDGs, that is localized by each country, and implemented nationwide.

As a transnational and non-state actor adapting to the new global paradigm, Smartly- Social Entrepreneurship on the SDGs, is a social enterprise leading the way in coordinating action to communicate and localize the SDGs within the private and public sectors, in Latin America and beyond. The innovative element is that Smartly operates as a private entity proposing and implementing public policies. One of its main creations has been the Local Parliaments Network on the SDGs, which is a unique initiative dedicated to localizing the SDGs on a global scale starting from the local legislative level. It seeks to harmonize the work of local parliaments with the needs of their communities to ensure inclusive participation from all stakeholders, while empowering local representatives through formal training on the SDGs, and thus achieving their localization as a tool for governance. Founded only 17 months ago, the Local Parliaments Network on the SDGs has formed alliances with 12 Local Parliaments in 5 Argentine provinces, and will soon count with more accessions from Spain, Guatemala, Mexico and Ecuador. Last

November, Smartly in conjunction with the Esquipulas Foundation launched the Network internationally, at the 26th Ibero-American Summit of Heads of State and Government, which was held in Antigua, Guatemala. The initiative has also been presented at the II Forum for Local Governments in Seville, Spain.

In the area of transnational cooperation, our social enterprise has also created the platform 'Sustainable Entrepreneurs', which helps sustainable entrepreneurs around the world connect their ideas and innovations with opportunities across the global ecosystem, creating thus a global support system from a local position. Another example of Smartly's effort to mobilize action and promote the SDGs, is through the establishment of its creative space 'Smartly Youth', where young and talented minds showcase their abilities through photography and audiovisual content on issues such as resilience, sustainable fashion, and our campaign 'DoSomething4Peace'.

The implementation of the 2030 Agenda is a worldwide project that pivots innovation, education, and the battle against hunger, climate change, and injustice through national and global cooperation. Now, more than ever, we need to push our boundaries and strive to the best of our knowledge, to make the world a better place for all.

## SDGs Interlinkages: The Influence of Civil Society Organisations for action coherence

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### **Abstract:**

The holy grail of sustainable development is the integration across social, economic and environment dimensions. However, there is little evidence of policy coherence, with implementation at the domestic level often bedevilled by fragmented institutions that operate in silos. Additionally, non-state actors do not often fully participate throughout the policy cycle. The SDGs, as an international goal setting strategy, includes a focus on partnerships across issue-areas and across different segments of society, requiring implementation to move beyond policy coherence and towards action coherence. What are the prospects for international goal setting, and the SDGs specifically, in breaking the silos inherent in the current institutional landscape? This conference paper investigates the question above by firstly, proposing a framework to study the influence of SDGs to address issue linkages at the domestic level and; secondly, by analysing the influence of civil society organisations as a determinant of domestic policy change in implementing interlinkages. Empirically, the Malaysian CSO SDG Alliance, highlighted as a model form of partnership at the Asia Pacific Forum on Sustainable Development 2019, was studied towards addressing the linkages across the Biodiversity (SDG15) and Inequality (SDG10) goals. The findings are three-fold. Firstly, through process-tracing, it identifies the influence of the SDGs in the establishment of an alliance that transcends human rights and environmental groups. Secondly, it identifies the conditions under

which civil society organisations, as norm entrepreneurs, are likely to be influential in the implementation of interlinkages. Thirdly, it demonstrates the potential of the SDGs to yield substantive linkages, where consensus is achieved, as opposed to tactical linkages, where actors link issues solely for their own benefit. In summary, under certain conditions and through interactions with other actors, civil society organisations play an important role to derive normative consensus across issue areas, and hence, trigger a transformation towards sustainable development.

## Journey with SDGs: Bangladesh Perspective

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### **Abstract:**

“Transforming our world: the 2030 Agenda for Sustainable Development” was adopted by the member states on 25 September 2015. Soon after the adoption of the agenda, SDGs Implementation and Monitoring Committee, Bangladesh consisting of 20 members were formed at the Prime Minister’s Office to facilitate the implementation of SDGs Action Plan. Since then the Government of Bangladesh has done a commendable job to integrate the SDGs in the national strategic plan. In recognition of the fact that SDGs are overarching, the government of Bangladesh has adopted a “whole of society” approach for implementation and attainment of the SDGs. As part of this, consultations were held on with stakeholders’ engagement on the SDGs implementation involving the parliamentarians, NGOs, CSOs, business community, development partners, ethnic minorities, professional groups, labour associations, women network and media. This paper aims to put light on how the journey of SDG implementation has been so far for the Government of Bangladesh involving all these stakeholders. It will examine how the SDGs played a key role in the preparation stage of the national strategic plan i.e. 7th Five Year Plan. It would also discuss on major findings from the documents formulated by the Government of Bangladesh like “Mapping of Ministries/Divisions by Targets in the Implementation of SDGs Aligning with 7th FYP (2016-2020)”, “Data Gap Analysis for Sustainable Development Goals (SDGs): Bangladesh Perspective”, “SDGs Financing Strategy: Bangladesh Perspective” and “The M&E Framework of SDGs: Bangladesh Perspective” and how all these attributed to the final action plan of SDG implementation in Bangladesh. The paper will highlight the opportunities and challenges to implement the action plan and monitor the progress of SDGs implementation in Bangladesh. It will also put some recommendations for what could be done in future to ensure the smooth implementation of Bangladesh’s national action plan on SDGs implementation.

## The Role of Scouting in Achieving the SDGs

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**Abstract:**

Scouting is the largest educational youth movement in the world. Throughout the world, Scouts work towards creating positive change and establishing peace in their communities in many ways: from imparting social entrepreneurial skills; advocating gender equality, peace, human rights and environmental conservation; to facilitating conflict resolution; and providing emergency response. The World Organization of the Scout Movement (WOSM) today unveiled Scout for Sustainable Development Goals (SDGs), an unprecedented mobilization of 50 million Scouts to make the world's largest coordinated youth contribution to the SDGs. Over the years Scouting has made any extraordinary contribution to improve the sustainability of our planet, promote peace, and tackle inequality. Already Scouts have contributed more than one billion hours towards sustainable development through initiatives under the Better World Framework. SDGs are intrinsically linked to all the values of scouting, like the mission, the promise, maybe the things they say every day, what they do-Creating a better world! A better world is a world where the SDGs are attained. The main objective of the research is to show how scouts contribute to achieve sustainable development goals all over the world. The study also opted to evaluate the opportunities and challenges of implementing scouts program for achieving SDGs. Also the existing scouts program will be evaluated under this study. The expected outcome of the research is identifying the findings and limitations of scout program for addressing SDG programs. The final output of such huge work is the solution approached on sustainable use of scout program of different countries for better work on SDGs. The study on world scout program is highly challenging with plenty constraints which will also contribute into the national and transnational knowledge cooperation. In a word, the study will be a significant work both on scouting and SDGs in the world.

Keyword: SDGs, Scouting, Sustainability.

## [The implementation of the 2030 Agenda in the EU: Lessons learned from networks/policy forums](#)

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**Abstract:**

Universality is one of the key elements of the 2030 Agenda, meaning that all countries are addressed and have to make progress in order to achieve sustainable development. The European Union was one of the frontrunners negotiating the 2030 Agenda but since the adoption of the Agenda it has become clear that the actual implementation remains challenging. One of the questions is how to bring scientific solutions that already exist for many problems to the political level in the EU and its Member States.

To foster information exchange between academia and politics, the Sustainable Development Solutions Network (SDSN) started a cooperation with the European Network of Political



Foundations (ENoP). The networks formulated a Call for Action to push on EU institutions for a more ambitious implementation of the SDGs. The implementation of the SDGs is done in the EU on different levels and through different actors: EU institutions have to develop instruments and at the same time Member States play a critical role for the implementation as well as for pushing forward progress on EU level. This complex setting requires actors from civil society and academia to follow the implementation and existing challenges. Fostering information exchange between networks and its memberships can play an important role to overcome the gap between the different disciplines and across political parties.

The 2030 Agenda is often still seen as an agenda for development and environmental issues. The networks can help to bring the SDGs into the discussion in all other political fields. With regard to the changing political landscape at EU level after the EU Parliamentary elections, it will be even more important for those networks to keep track of how the implementation is done and which priorities are set. It has become obvious that the SDGs / 2030 Agenda have to be included in official EU strategies and budgets, only that way SDGs can be really implemented and become reference point for politics. Member States have to push EU institutions to take necessary steps. Sustainability organisations and institutions should call for stronger inclusion of SDGs, so that responsible actors feel obliged to do that.

One observation is that over the last months a politicisation of sustainability and climate issues (see movements such as Fridays for Future) has taken place. One option would be to take momentum of Fridays for Future and similar movements to bring these topics more on the agenda of politicians and parties. Sustainability actors have to keep track and monitor further implementation in next years, so that 2030 Agenda keeps playing a significant role, not only for development and environmental policies but beyond that. 2030 Agenda can be reference point for pressing challenges in the EU such as youth unemployment, migration, inequalities.

## Crosscutting research for a sustainable food system transformation - a solution-oriented approach

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### **Abstract:**

Initiated in 2012 the Leibniz Research Alliance 'Food & Nutrition' bundles the competencies of 14 Leibniz research institutes in Germany under inclusion of further network partners such as universities, the FAO, and the OECD. The Alliance serves as an application-oriented partnership structure to stimulate and strengthen trans- and interdisciplinary cooperation, and to generate innovative research synergies to tackle two societal challenges that are closely interlinked: sustainable and sufficient food production, and healthy and adequate nutrition.

Achieving global food security poses high challenges for socio-ecological systems, e.g.

adaptation to shifts and disruptions, integration of productivity and environmental integrity, social equality, or resilience to climate change. How could interdisciplinary research address these societal challenges without diluting disciplinary competencies? Research is often very disciplinary and exempted from the needs of the 'outside' world, which makes results hardly practicable or directly implementable in response to complex problems. Therefore, solution-oriented research requires new and proactive cooperation of scientists but must as well include comprehensive partnerships with multiple societal stakeholders, in response to growing societal problems. The Research Alliance has identified crosscutting research topics that have the potential to foster efficient interdisciplinary collaboration for innovativeness and the development of concrete realisable, applicable solutions by carrying out activities from basic to applied research. One of these topics is the realignment of future protein production, protein supply and demand towards 'a safe operating space for food systems' (Willett et al. 2019). Scientists work together in new constellations to develop an interdisciplinary framework for protein research under the objective to align research agendas towards SDG fulfilment. The SDGs and their indicators can be very useful for scientists to put their research in an application context.

So far, the interdisciplinary cooperation of the Alliance has resulted in manifold research and solution approaches for concrete problems, e.g. identifying the biological value of proteins, ensuring food safety, optimised resource efficiency, as well as the development of alternative location-independent production systems.

However, international acknowledgement of research achievements needs active mediation to increase the transfer from science to practice and vice versa. Many obstacles need to be overcome in the communication of the academic and the business world in order to jointly achieve rapid progress towards a sustainable world food system. In this context and for the effectiveness of research science management, and science communication, respectively, provide essential support for scientists, since knowledge generation alone does not automatically lead to action and application. From the beginning, the solution-oriented approach included a strong networking element to improve the transfer of knowledge and experience in order to have sustainable effects.

This contribution discusses working methods as well as first results, and gives an outlook to an important next step, the internationalisation strategy of the Alliances' network.

## Exploring the new role of South-South Cooperation as a fundamental instrument to achieve development in transition in Latin America

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Ph.D Student in political and social sciences of the National Autonomous University of Mexico (UNAM), is interested in knowing how South South Cooperation is linked to the development of Latin American countries, specifically with Brazil, Colombia and Mexico.

He has experience in development cooperation project management at the International Organization for Migration (IOM) in San José, Costa Rica, and at the Regional Center for Learning in Evaluation and Results (CLEAR LAC).

**Abstract:**

The Economic Commission for Latin America and the Caribbean (ECLAC), the Development Center of the Organization for Economic Cooperation and Development (OECD) and the European Union presented the document Emerging challenges and shifting paradigms: New perspectives on international cooperation for development , Which introduces the debate on "development in transition" as an approach that aims to rethink international cooperation for development that is aimed at middle income countries, and tries to draw a scheme that goes beyond income and the traditional financial aid schemes, to take into account the conditions of these countries and achieve better levels of development and well-being.

The concept of "development in transition" is particularly important for Latin America, a region where most countries have average income levels but still face structural challenges. These challenges are mainly related to inequalities, regional differences, the mobilization of internal resources and the weakness of social frameworks, as well as the scarce innovation capacities and low levels of diversification; but also, in this region there is an intense dynamic of exchanges of capacities and experiences through South-South Cooperation, which becomes an invaluable input to achieve the development of the countries of the Latin American South.

The purpose of "not leaving anyone behind" the 2030 agenda cannot be achieved in isolation or simply by improving financial aid. In this context, development in transition represents an opportunity to advance in the achievement of the Sustainable Development Goals (SDG) taking into account the economic and social characteristics of Latin American countries, but how can South-South Cooperation be linked to the agenda? 2030? What challenges and challenges does "development in transition" entail for Latin America? With what capacities does this region have to reach the transition?

This research intends to analyze the role of South South Cooperation in the achievement of the SDGs in Latin America, using the "development in transition" approach; For this, this approach will be analyzed, as well as its application through the identification of the capacities to achieve the development in transition in the region.

## The Role of Alumni Work for Transnational Knowledge Cooperation: Evidence from the Managing Global Governance Network

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### **Abstract:**

Transnational knowledge cooperation in networks is crucial to create sustainable solutions for global challenges. The Sustainable Development Goal (SDG) 17 highlights this importance by seeking to strengthen global partnerships to support the implementation of the 2030 Agenda. Contemporary challenges such as climate change, epidemics, cybersecurity, migration or social injustice demand transnational cooperation. Collaborative action is required because one single nation alone cannot solve global problems. Therefore, multilateral cooperation is growing in importance. At the same time, cooperation is also under attack. Neorealists argue that cooperation is most unlikely to occur because on a global level no external authority to compel or incentivize cooperation. Authors such as Kupchan 2012 or Ian Brenner (2012) are even more negative and postulate that each state will act selfishly neglect the global common good. (D. Messner & S. Weinlich, 2016, p. 7). Therefore, it is even more necessary to analyse instruments that support effective cooperation. Alumni work can be regarded as an instrument to support effective transnational knowledge cooperation. Research and educational organizations can benefit from alumni work because it maintains and increases transnational knowledge cooperation. Within this poster, two sections explain the main aspects regarding the role of alumni work for transnational knowledge cooperation. The first part of the poster concentrates on transnational knowledge cooperation, while the second part focuses on alumni work as a specific type of transnational knowledge cooperation. The concluding part presents the benefits of alumni work for transnational knowledge cooperation.

## The Role of Transport in Achieving the SDGs

### Public Investment in Infrastructure (Transport) Development: Impact on Landlocked Countries Economy

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### **Abstract:**

1. Preliminary title

Public Investment in Infrastructure (Transport) Development: Impact on Landlocked Countries Economy

## 2. General description of proposed research

This research proposal focuses on the role of public investment in infrastructure development to stimulate economic growth in landlocked countries. The research will show that public investment in infrastructure (transport) development is justified and leads to real economic growth and sustainable development in such places. The research will showcase the Republic of Armenia. Based on international practice and the literature on public investment in infrastructure, this paper will outline ways to evaluate existing infrastructure investments, will better assess and estimate the connection between public investment and economic growth, and will demonstrate the overall value of infrastructure enhancements.

## 3. Background

The Republic of Armenia is a landlocked mountainous country located in South Caucasus, bordering Georgia, Azerbaijan, Iran and Turkey, with a population of about 3 million, and a territory of 29,800 square kilometers.

The Armenian economy has undergone a profound transformation since independence in 1992. Comprehensive reforms have engendered sustained growth and created a market-oriented environment. However, the global financial crisis affected Armenia as well. The crisis proved to be a serious challenge with deep socio-economic challenges that taught important lessons about reassessing the country's economic opportunities and reevaluating global constraints. Decision-making on public investment is of particular importance for developing countries, where budgets are constrained. Thus, such investment decisions can be justified only if they are based on a deep and comprehensive analysis, and the social and economic impact and public utility of these decisions are identified and properly assessed.

## 4. Main research questions

How significant is the impact/contribution of public investment in infrastructure to the economic growth of landlocked countries? What are the main preconditions for public investment in infrastructure to ensure economic growth? Do investments in transport infrastructure have positive effects on economic growth for landlocked countries, such as Armenia?

## 5. Main hypotheses to test the research questions

Economic growth compared with prior public-infrastructure investment. The key aspects of landlocked countries' development are investments in transport infrastructure and effective regional cooperation.

## 6. Main data and information sources

The main data and information sources can be obtained from the national and international

statistics, as well as cross-country, cross-sector, thematic research outputs and analysis provided by International Financial Institutions, research departments, international think tanks and research organizations.

## 7. Methodologies to be used to answer the research questions

A methodological approach is necessary to conduct this research in order to answer the above-referenced questions.

The decision tree: A descriptive model would be used in order to decide whether to invest in infrastructure or not, and if yes, which type of public investment model would be the best choice.

SWOT analysis and cost-benefit analysis would be used to assess the most effective type of investment for current and future investment projects.

This research would utilize information gathered through ex-ante and ex-post surveys to fully examine factors that could affect the potential investment models in transport.

Secondary data, benchmarking techniques would be used to understand investment practices across the world, mainly in developing and landlocked countries.

## Ensuring healthy lives and wellbeing: The role of unmanned aerial vehicles (drones) in healthcare service delivery

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### **Abstract:**

**Background:** Access to healthcare services is an indispensable human right and a fundamental indicator of sustainable development. This access can be hindered by transportation in the delivering of medicines and vaccines in some specific areas. Recently, drones have been used as an alternative for the transportation of medicines in emergency situations. Drones possess the capacity to transport medical drugs quickly, safely and at a cheaper cost across both accessible and mountainous terrains. This article explores the role of drones in health service delivery both in developing and developed countries. We hypothesise that drones will enhance the quick delivery of health services.

**Methods:** We conducted a systematic search in four databases for quasi-experimental,

randomised controlled trials and observational studies published between 2016 and 2019. An additional search was conducted in reference lists of relevant studies, Grey literature and the Google search engine. A grading protocol was used to assess the quality of the identified studies.

**Results:** Of the 173 identified studies, 10 met the inclusion criteria of this review as they reported the role of drones in healthcare service delivery in Africa, Europe, North America and Oceania. The included studies gave reports on the use of drones in healthcare delivery of tuberculosis (TB) test samples, HIV testing kits, medications and blood samples. Others are vaccines, tourniquets, dressings, analgesics, and automated external defibrillator. As reported, delivery times of these medical supplies were fast and timely.

In support of our hypothesis, drones' reductions in response time greater than 13 seconds were statistically significant in Canada. In Holland, it takes one minute for drones to reach patients and 10 minutes for Emergency Medical Services (EMS) within a 4.6 square mile. In Rwanda, drones delivered medical supplies within 30 minutes after orders were placed from hospitals and in the United States, it took one minute for drones to deliver medical supplies what would have taken an ambulance 61.35 minutes. In Sweden, drone arrived before EMS in 32% of urban emergency cases. In rural areas, it arrived before EMS in 93% of emergency cases. The quicker drone response rises the chance of survival to 80% compared to 8% of conventional emergency services.

**Conclusion:** From the findings of this systematic review, it is evident that drones have positive effects on medical delivery by providing fast and quicker response times, decreased transportation cost and enhanced medical supplies to accessible and remote terrains. Though there are challenges and risks in the operation of drones, they can be surmounted with the progress in technology and research.

**Research limitations:** There is a scarcity of studies on this subject matter and this affected the robustness of the studies reviews.

**Keywords:** Automated External Defibrillator (AED), Drones, Healthcare delivery, Out-of-Hospital Cardiac Arrest (OHCA)

## **Transport Fuel Subsidy Reforms on the Indian Households:An Application of LA-AIDS Model**

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**Abstract:**

Transport planning plays an important role in climate change mitigation policies and energy security as it accounts for roughly 63% of the share of global consumption of liquid fuels and is expected to increase more than 80% by 2050 accounting for 70% of carbon emissions. Thus, sustainable mobility is a prerequisite to achieving Sustainable Development Goals (SDGs), contributing directly to SDG 3,7,11, and 12. Rapid urbanisation and increasing population in emerging economies has accelerated residential transport energy use and vehicle ownership to satisfy the demand for mobility; raising serious concerns for energy security and climate. This paper seeks to assess the impact of transport fuel subsidy reform on the household energy demand and income. Whether or not the fuel subsidy reform reduces the fuel consumption and carbon emissions depends on how responsive the consumers are to the fuel prices. Thus we aim to assess how responsive the households in India are to the energy price changes, through estimating the expenditure and price elasticities of household demand for the cooking, lighting and transport fuels using household consumption expenditure survey dataset comprising 59,695 rural households and 41,967 urban households by National Sample Survey Organisation (NSSO) for the year 2011-12. The earlier NSSO reports did not report information on transportation fuels. We apply the LA-AIDS model using a two-stage budgeting technique to derive price and expenditure elasticities for the residential fuel consumption in India. The complete demand system model was estimated using Iterated Seemingly Unrelated Regression (ITSUR). Furthermore, we calculate the welfare losses for households when the fuel prices increase.

We find that transport fuel is price elastic in both urban and rural areas, which means that Government's decision to remove the transport fuel subsidy is an effective means to reduce the residential transport energy use in India. However, the lower income group remain relatively more vulnerable to price changes. The sensitivity of the transport fuel to income is relatively larger for the middle-income group; which comprises of about 60 percent of the sample. The values are significantly higher for the urban areas than the rural. This is an important observation in the context of India's expanding middle-class population and rapid urbanisation. The future transport-fuel consumption is expected to grow at a rapid rate which means that cutting emissions from transport sector will be key to resolving climate change issues to a large extent. Under the prevailing conditions, households do not have an affordable substitution option for transport fuels like petrol and diesel, and hence decarbonising transport sector needs investing in alternate fuels and technology. For the long term, we also need good policy which encourages public transport system. Based on our results, we discuss appropriate policy interventions needed for sustainable transport options.

## Strategic long-term investments in public transport through the lens of climate change

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**Abstract:**

The transport sector is one of the main contributors in climate change. According to the World Bank, under current patterns of motorization and energy use, this sector will become the main consumer of oil by 2030. In 2018, the Intergovernmental Panel on Climate Change released a report that stresses the urgency to limit global warming to 1.5°C compared to 2°C. Financing infrastructure in sustainable transport becomes critical to achieve these targets.

To reduce transport emissions, decarbonization strategies highlight some actions such as reducing vehicle dependency, while creating infrastructure for sustainable transport and shifting to vehicles based on renewable energies. Transit has the capacity to change the urban form into compact cities and mix-used developments that later could decrease travel distances. These urban forms can decrease urban sprawl, while transit can manage congestion levels from a growing population in metropolitan cities. At the same time, it is necessary to create resilient infrastructure to cope with extreme events.

Transit infrastructure investments require significant mobilization and optimization of financial resources, and political commitment that can sustain these investments through time. Moreover, in metropolitan cities, individuals use national and municipal networks to travel from an origin to a destination. Investments must be coordinated under a system that integrates harmoniously both government levels and municipal jurisdictions, allowing for programming and budgeting to achieve desired results.

The main objective of this research is to develop a method for long-term strategic investment plans for bus corridors to reduce Greenhouse gas emissions (GHG) from urban mobility in a metropolitan city. This decision-making model aims to perform scenarios with trade-off analyses with linear optimization techniques among transit corridors for a 15-year period under budget constraints. The case study is the Great Metropolitan Area of Costa Rica.

This model aims to upgrade the system to Bus Rapid Transit or High Occupancy Lanes to improve travel time and induce modal shifts. A demand model analysis is performed to forecast trips among private vehicles, bus and rail to estimate GHG emissions. By minimizing to a target GHG emissions, projects are prioritized. Other analyses include pavement preservation under a life-cycle cost analysis that will provide timely maintenance to halt deterioration and reduction of private vehicles fuel consumption due to better surface conditions. Stronger pavements will improve in resilience under extreme weather events and deliver savings in budgets by treating roads at the right time and place.

These models are integrated to deliver a 15-year evidence-based plan that allows programming and budgeting of projects for national and municipal networks. This can improve transparency and credibility for resource mobilization, as well as monitoring progress through performance

indicators.

This method can be transferred to other metropolitan cities around the world of high and middle-income countries (186 countries according to the World Bank's GNI classification). Low-income countries (31) might require a simpler method due to limitations of data collection costs.

## The Role of Transport in Achieving the SDGs: Assessing the Sino-Congolese Partnership in the e-Mobility Revolution

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### **Abstract:**

The world has moved towards a low-carbon economy. Green technology development also includes the decarbonization of all transportation. The development of e-mobility contributes to promoting clean energy in line with the commitments of the 2015 Paris Agreement on climate change, and the Sustainable Development Goal (SDG) on energy (SDG7), one of seventeen SDGs of the 2030 Agenda for sustainable development adopted by the United Nations on September 25, 2015. Electric Vehicles (EVs) are powered by rechargeable batteries, mainly comprising lithium, nickel, and cobalt. The electrification of vehicles decreases dependency on petroleum. It requires a growing use of strategic minerals due to the high demand expressed by carmakers, battery manufacturers, and other consumers of electronics. Hence, it reveals the hidden geopolitics of these minerals.

China has progressively gained leadership in the electrification of vehicles. In Africa, it has developed strategic partnerships with resource-rich countries to increase control of base metals and Rare Earth Elements' (REEs) supply chains, through the Belt and Road Initiative (BRI). China strengthened its economic ties with the DR Congo, which holds between 10% and 30% of the world's copper and cobalt reserves in the ex-Katanga province, known as the copper-cobalt belt. On September 17, 2007, a Sino-Congolese mining and infrastructure agreement of USD 9.5 billion was signed to participate in the DR Congo's economic reconstruction. The deal surprised Western countries. In May 2009, the IMF questioned the debt sustainability posed by the Sino-Congolese deal. In October 2009, the deal was revised, removing the infrastructure component. It was downsized to USD 6 billion to ensure its compatibility with the country's debt sustainability.

The paper examines how the DR Congo and China partnered each other to unlock Congolese mineral wealth, particularly cobalt, in the context of electric automotive development.

Firstly, the paper studies the growing Chinese outbound mining investments in the copper-cobalt belt, following the Sino-Congolese deal.

Secondly, the paper stresses that China has propelled the DR Congo to the forefront of green technology, whereas the DR Congo struggles with improving governance in the mining sector. While the cobalt rush has intensified, a general concern has emerged pertaining to the traceability of 20% the cobalt mined by Congolese artisanal diggers, due to social risks.

Thirdly, the paper analyses the recent US private initiatives, given the expanding Chinese cobalt footprint in the DR Congo. Early January 2019, Eric Prince (founder of the private security company, Blackwater) created a new venture focusing on mining projects, notably in the DR Congo and Afghanistan. Then, on March 4, 2019, Kobold Metals opted for developing cobalt projects by setting up a database of geological data. The startup is supported by Andreessen Horowitz (a venture capital firm) and Breakthrough Energy Ventures, including Bill Gates (Microsoft), Jeff Bezos (Amazon), and Michael Bloomberg (Bloomberg LP).

In the era of green technology, the findings suggest that the quest of securing cobalt has unveiled a new aspect of growing economic tensions between the US and China; notably in Africa.

## China's Rise and Sustainable Industrialization in Africa: End of the Flying Geese?

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### **Abstract:**

What role does China play in the structural transformation of African states? Will China help promote inclusive and sustainable industrialization as per SDG 9? This is the question posed by the Oxford Handbook of Africa and Economics: Volume 2: Policies and Practices. (2018) with Justin Lin making the case of China's potential in raising African states structural transformation. This is an important question if the role of industrialization in poverty reduction is to be taken seriously. This paper takes a contrary view. The rise of China as a dualist economy that is both developed and developing and with its vast satellite economies in Eastern Asia has led to the monopolization of global FDI intake by Eastern Asia region at the expense of other developing regions of the world. As a result Africa's share of global FDI has fallen from 9.5 in 1970 to 2.9 in 2018. This 'diversion' of FDI from developing countries to China and its satellite economies has meant that Africa's reliance on FDI for capital formation is also falling as has Africa's ability to attract labor intensive manufacturing FDI such as is in textile production. This fall in capital from FDI has necessitated African states to escalate borrowing –more so from China- thus creating a vicious cycle of indebtedness and debt repayments that does not allow for sustainable structural transformation of African economies. To contain this insidious cycle three responses for African states namely; the build-up of a large common market based on investment rather than trade, the push for structural changes that emphasise global balanced growth, and a political push World Bank's return to 'development' states are proposed and

discussed. The study uses the case of Kenya to using government data on the relationship between FDI and debt and export interviews of there are government standards on sustainable infrastructure development. The study contributes to scholarship on influence of China on Africa's structural transformation and SDG 9 on sustainable infrastructure development.

## Physical characterization of sidewalk particulate matter due to vehicular traffic emissions.

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### **Abstract:**

Exposure to vehicular traffic emissions is an important component in the design of transport policies.

Particulate matter, black carbon and carbon monoxide measuring instruments, were mounted on a device to obtain the vertical and horizontal distribution of near to road concentrations of these pollutants. The measurements provide concentrations and particulate size.

It was found that their concentration distribution resides mainly in preferred heights and distances to the road, depending on traffic flow and meteorological conditions.

This knowledge provides an opportunity for placing ecological barriers to mitigate exposure. Preliminary results of a field campaign will be presented objectively testing the convenience of sidewalk exposure barriers.

## The Addis Ababa Light Rail Transportation significance on the city's sustainable development

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**Abstract:**

The sustainable development goals concerns on taking action to end poverty, to protect the planet and to ensure peace and prosperity among the society, (2019, UNDP). Consequently, adequate and green infrastructures and services are vital to improve economy, environment, society, health, education and others related issues throughout the globe. Especially in the developing countries this subject requires an extensive attention. To this end, In September 2015, United Nations Development Program (UNDP) sets 17 goals to tackle these worldwide concerns. According to UNDP's strategic plan (2018-2022), three major areas are designed: eradicating poverty; structural transformations; and building resilience. Accordingly, this paper focuses on the role of transport in achieving the sustainable development goal.

Ethiopia is one of the few countries that has enforced SDGs and integrated in the country's policy and strategy development plan. Among many other issues related to the SDGs, improving public transportation was one of the priorities given on Ethiopian millennium development plan. As a result, in September 2015, two direction of light rail was built crossing the heart of the capital city Addis Ababa. The rail serves about 120,000 people per day.

Addis Ababa LRT has been a significant urban transportation in improving the socioeconomic activity in the country. It has created job for many and it gives cheap transport service to the public. Also it has high-efficiency on saving travelling time. As it is mass transport it commutes a lot of passengers per trip compared to the conventional transport (Mini-bus). This has benefited in eliminating conjunction and boosted the economy.

This study shows the public transportation significance enhancing the SDGs in terms of economic, environment and social aspects, particularly on the Addis Ababa light rail public transportation. The study used case study method, in which two places were selected based on their similarity of urban public transport. The study areas are; Addis Ababa light rail transport located in the capital city of Ethiopia and Toyama light rail (portram) in portal city of Japan with Light rail transport. The study compares the population distribution through the cities by combining the census data and land use map. This shows the Central Business District (CBD), which indicated the urban market economic activity. In addition, spatial analysis is conducted to study the integration of existing land use development near the selected stations of light rail transport and feeder roads of public transport of both cities. The result showed the need for open spaces, public parks and mixed development near the LRT transportation stations, for green environment and advanced socio-economic activity.

## **Transforming the Higher Education System to Accelerate SDG Implementation**

## Attaining Sustainable Development through Chemistry Learning: An Experience with Hypermedia Mode of Delivery

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### **Abstract:**

Sustainable development constitutes one of the most significant issues of global relevance being inexhaustibly discussed. Education is seen as key in the process of achieving sustainable development as it serves as a potent tool for achieving sustainable development goals. In the attainment of education for sustainable development, science plays an essential role. A vital aspect of science which is indispensable in the school curriculum as it serves as a foundation for many fields of knowledge like Medicine, Pharmacy, Pharmacology, Biochemistry, Biotechnology, Nanotechnology, Dentistry and Surgery, is Chemistry. This study assessed the effectiveness of a developed hypermedia software which allows users access to information according to their unique needs and interests in selected Chemistry topics. The study employed a pre-test post-test control group design. A sample of 30 students were selected from each of two purposively selected private secondary schools in Osun State, Nigeria. The experimental and control groups consisted of 30 students each. The experimental group was exposed to Chemistry using the developed hypermedia software, while the control group received instruction through the conventional method. The developed hypermedia software was designed using Macromedia Video works and web services based on design principles of instructional hypermedia systems. The instrument used for data collection was the Chemistry Learners Attitude Towards Hypermedia Software Inventory (CLATHSI). Data were analysed using t-test of Significance. The results showed that the developed hypermedia software produced a significant difference in the attitude of students towards Chemistry between the two groups ( $t = 15.484$ ,  $df = 58$ ,  $p < 0.05$ ). Students exposed to the developed hypermedia software displayed better attitude to Chemistry than those that were not. The study concluded therefore, that the use of the developed hypermedia software improved the attitude of students towards Chemistry positively. Since Chemistry occupies a central position among the science subjects and for the fact that it is a core subject for the medical sciences, textile technology, agricultural science, synthetic Industry, printing technology, pharmacy and chemical engineering, to mention just a few, there should be no doubt whatsoever that a positive attitude of students towards Chemistry as experienced while learning through hypermedia mode of delivery will enhance the attainment of sustainable development goals.

## Development Diplomacy - building the capacities, skills and competences of learners for the SDGs

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**Abstract:**

Worldwide, an increasing number of Universities have embedded SDGs in their learning and teaching, aiming to promote their implementation. Consequently, this will need also the transformation of learning and teaching methods to build the capacities, skills and competences of all learners, they will need in practice to implement SDG endeavours.

In this respect, the present contribution shows the value added of introducing 'Development Diplomacy' as a novel and effective approach to shape learning and teaching in Higher Education, to build student's skills and competences, including their assessment, with the objective to enable all learners in real life to put in practice the transformational policies and institutional reforms to reach coherence with the Agenda 2030, and facilitating international cooperation and multi-stakeholder partnerships in different contexts at local and global level to accelerate the SDG implementation.

Development Diplomacy (DD) represents a practice of contemporary Diplomacy in international relations, targeting and focusing on issues related to sustainable development (SD). DD developed as part of the enveloping context of the broadening circle of participants, including nations, non-state actors and civil society organizations in policy-dialogue and policy-negotiation of Global Governance Agendas. DD became a practice to facilitate multilateral and multi-stakeholder negotiations for the agenda setting, its conceptualization, framing the goals and targets, and promoting the implementation, as of the SDGs among others.

The DD approach in learning and teaching is based on the systemic understanding of sustainable development, aiming the economic, social and environmental dimension and political processes, to address the complex interactions from which the sustainable development outcomes unfold. Also, it refers to the universal values of humanity expressed by the UN Declaration of Human rights, and as aimed by the SDGs.

DD leads to a deeper understanding of the complexity and interlinkages of global problems and in response common sustainable solutions. DD targets learning content and values and training in skills and competencies, - at its core interpersonal skills cooperation, problem solving, critical and innovative thinking-, which are needed to implement all SDGs, especially Goal 17 on partnerships.

The learning goals of DD align with the SDG' target 4.7 focusing on citizen education and education for sustainable development:

Students become an agent of DD at the personal level, prepared as practitioner in project activities, research, policy formulation and multi-stakeholder negotiation for Sustainable development.

DD based learning empowers students for a bottom-up approach, aiming a whole of government and whole of society approach to engage in multi-stakeholder partnerships, applicable in distinct contexts and at local, national and international levels to implement the SDGs.

Universities introducing this novel approach, need to develop learning platforms, which facilitate students to acquire and exercise the mentioned competences and skills, and enabling assessments based on verifiable results.

To put this in place, the University might reframe its activities in research and outreach in a coherent program to innovate its educational system and seize the opportunity to collaborate with a wider society to contribute to the implementation of SDGs.

## A Need Assessment Survey for the Inclusion of Curriculum on Education for Sustainable

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### **Abstract:**

The Sustainable Development Goals (SDGs) were formulated to secure economic development and ensure social equity among others. To achieve the goals, universities have been assigned the responsibility to educate students for sustainable development through the transformation of the curricula to integrate Education for Sustainable Development (ESD). While several universities have transformed their curricula to accommodate ESD many universities in Nigeria do not have a framework with which they can educate for sustainable development. This study, therefore, carried out a need assessment to determine existing framework in Nigerian universities with which they can educate their students for sustainable development. The study adopted descriptive survey design and employed cluster sampling to group South-western states into three zones (Lagos/Ogun, Oyo/Osun and Ondo/Ekiti). From each zone, three universities were randomly selected, making a total of nine universities. From each university, 250 undergraduates were randomly selected; 2,250 undergraduates participated in the need assessment. The instrument used was Curriculum on Education for Sustainable Development Needs Assessment Questionnaire with two subscales: Awareness ( $r=0.87$ ) and Practices ( $r=0.85$ ), data were analysed using descriptive statistics of frequency count, mean and standard deviation. The results of the findings showed that undergraduates' awareness ( $\bar{x}=2.07$ ;  $SD=0.52$ ) and Nigerian universities sustainable development practices were ( $\bar{x}=2.10$ ;  $SD=0.07$ ) were low (using the threshold of 2.50 as the criterion norm). Based on the findings, it was recommended that Nigerian universities need to provide a framework through which they can



educate their students for sustainability and that is through the development of a formal and organized curriculum as this will enable to keep abreast with international best practices in teaching and learning for sustainable development.

## The Role of Higher Education for Implementing Sustainable Development Goals (SDG) in Nigeria

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### **Abstract:**

The road to higher education in Nigeria began with the effort of colonial government in the 1940s when the premier university was established. Nigeria now has over hundred higher institutions operated by the Federal Government. There are also many public and private higher institutions. The higher institutions are seen as knowledge producer, and serve as a strong means to help create knowledge delivery in order to ensure more sustainable future. Thus, the concept of 'higher education for sustainable development' has become, in recent years, one of the main educational initiatives that tackle many challenges associated with human development.

In order to attain the global education sustainable goals, many nations around the world are bringing up several innovative approaches to sustain their various educational agenda so as to meet the SDGs by 2030.

This paper examines the framework of good quality education in SDGs and provides further role that should be played by higher institutions in improving the current approach to a world class innovative system so as to empower the next future generation and to change the approach of learning to attain the sustainable future by 2030.

We submit that in order to attain the SDGs in Nigeria, our higher institution must invest into innovative teaching technologies and research such as improving on the level of ICT compliance, introduction of e-learning and e-library system with global accesses to world class online systems. One major lacking part is mentoring; majority of African Universities does not promote mentoring of the younger generations. We argued that our higher institutions should revive the research and teaching assistantship program in order to train the young and willing minds who are more of this generation to learn from the master of the business to inculcate the new ideas into the learning system. This will ensure that, the new horse can perform the old tricks and still performs better in the new tricks. Thus, sustenance is sure!

**KEYWORD:** Higher Education, Sustainable Development Goals, Mentoring

## Towards Active Universities' Stakeholders in the era of SDGs in Spain

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**Abstract:**

**Purpose** –The purpose of this study is to explore the knowledge and opinion about the sustainable development of direct universities' stakeholder in Spain: students' representatives, academic experts, and environmental managers. It illustrates a more critical framework for stakeholders and the establishment of meaningful correlation between the university and the university community.

**Design/methodology/approach** – The methodology adopts a qualitative method based on the techniques of focus group and depth interviews of student's representatives, eco-campus managers and academic experts of Spanish universities. The techniques were conducted by semi-structured questionnaires based on five categories to approach an holistic perspective of the sustainability in universities.

**Findings** – This research highlight mainly the assessment of universities sustainable commitment, the encouragement of environmental sustainability in society through the mission of the university, environmental management at the campus, the knowledge and assessment of universities performance and main barriers to introducing sustainable actions in Spanish universities. The results are oriented to the integration of stakeholders' participation in the management model to contribute to the strategic process of developing politics and practices towards sustainability. It also showed the valuable stakeholders knowledge to be translated into new mindsets and culture to rise ownership in the role of the university toward sustainable development.

**Practical implications** – The findings led the authors to conclude the importance of stakeholders' contribution to the management model of universities towards a co-designing and co-producing concerted holistic efforts. In the pursuit that universities provide knowledge, solutions to implement sustainable development. The inclusion of SDG through the governance, the management and culture and to add leadership in local and global settlements.

**Originality/value** – The findings, implications, and conclusions are valuable to university administrators, researchers, and practitioners, as well as to Eco campus managers who are fostering the integration of the SDGs through the mission of universities. Additionally, the potential influence of HEIs on industry and government policies engage people in the

community and assumes that HEIs have a vital role in the process of transforming into a sustainable future. In this context, this study addresses the concerns of these groups of stakeholders, providing a dialogue on sustainable development challenges.

#### Keywords

Higher Education, Sustainable Development Goals, Stakeholders, Sustainability.

## Carbon emissions incurred from a college-sponsored outdoor recreation program

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#### Abstract:

This paper examines the CO<sub>2</sub>e emissions generated from the activities of a college outdoor club. While outdoor recreation is often viewed as environmentally positive, many outdoor sports require emission-intensive travel. This study examines the activity-based emissions of the Dartmouth Outing Club (DOC), the oldest and largest collegiate outing club in the United States. The DOC is one of the largest student organizations at Dartmouth College: Over 90% of Dartmouth's freshman class participate in the First Year Trips Program and in 2016, the Dartmouth Outing Club supported over 40,000 student-hours worth of outdoor activities. The activities offered by the DOC have a substantial impact on the students of the college, but at what environmental cost?

Over the past eight years there has been a marked increase in emissions from travel to outdoor activities. Travel emissions arise from both Scope 1 (fuel for cars, vans and trucks) and Scope 3 (primarily air travel) sources. Comparing these emissions against those which would be considered 'compliant' according to the Multi-Capital Scorecard (McElroy and Thomas 2015). Compliance within the Scorecard is based on an SSP1-2.6 scenario developed as part of Phase 6 of the Coupled Model Intercomparison Project (CMIP6). Analysis shows that the Dartmouth Outing Club is not compliant.

These findings reflect on the outdoor recreation industry as a whole. While outdoor recreation has not been prominently targeted as an activity for emissions reductions, this data suggests that more attention should be paid to the emissions produced from outdoor recreation activities. Suggestions for emissions reduction and offset are proposed.

Within the context of the Dartmouth College campus, the reporting and reduction of emissions from the Dartmouth Outing Club has been entirely student led. Using the Outing Club as a mechanism through which to engage with climate change has allowed this project to impact students through the activities they love--outdoor recreation activities. Cross-pollination

between academic studies and daily life is an important sphere to consider when studying the implementation of SDGs at a university level. The emission of the Dartmouth Outing Club provide a prominent example of this.

Sources:

McElroy, Mark W., and Martin P. Thomas. "The MultiCapital Scorecard." Sustainability Accounting, Management and Policy Journal, vol. 6, no. 3, 2015, pp. 425-438.

## Promotion of the SDGs at the Higher Education System national level and performance in international University rankings on sustainability. Any correlation? The Italian case of the "RUS"

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### **Abstract:**

Since the adoption of Agenda 2030 by the United Nations, Universities are considered key actors for the achievement of the Sustainable Development Goals. Teaching, research and the capacity to engage with institutions, the private sector and the civil society are the main drivers for the scope. This paper aims to describe the Italian case of the "RUS" (Rete delle Università per lo Sviluppo Sostenibile – Network of Universities for the Sustainable Development), promoted by the Rectors Conference in 2015, that includes almost 70 Italian universities characterized by a strong commitment for the Sustainable Development. Moreover, the study try to describe the relevance of the strategy at the national level for the whole higher education system. Starting from the theoretical framework proposed by the guide "Getting Started with SDGs in Universities", published by the Sustainable Development Solutions Network Australia/Pacific in 2017, the paper opens with a mapping of the best practices in the fields of sustainable development in teaching, research and public engagement of the Italian universities affiliated to the RUS. After a deep analysis of the most performing Italian cases the paper try to test such performances with the scores and positions of the universities under the Times Higher Education University Impact Ranking 2019. Rankings are becoming more and more important for Higher Education Systems in the last decades. What about rankings in sustainability focuses on? Are they a good tool in order to really understand the actual impact of Universities in the achievement of SDGs? A comparative analysis will be done at the end of the paper, in order to compare the Italian Higher Education System with the High Education Systems of other EU countries enlighten the role of the RUS in the – increasing or not - performances of the universities.

## Climate Change and the SDGs in the Caribbean : Youth led virtual Forums advocate for action

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**Abstract:**

The University of the West Indies (UWI) has a Vice Chancellor's Ambassadorial Corps which has as one of its mandates Climate Change Advocacy and Action. The UWI STAT (Students Today Alumni Tomorrow) Corps wishes to mobilize Caribbean youth through awareness, advocacy and action to prepare the Region for climate change and uses the SDG framework as its one of its core aims is to protect the planet. The Corps has hosted two regional virtual Climate Change Forums to raise awareness and promote advocacy and action in the climate change arena and to mobilize the current student body of over 45,000 university students regarding climate change and the SDGs. The UWI has four campuses in 17 English speaking Caribbean countries which it serves. The Corps decided to utilize the technology of the Open Campus (which provides online and face to face learning) to reach the maximum number of students through interactive discussion Forums. The first was held on April 12, 2018 with the theme "The eye of the story: the implications of the Paris Agreement and the "Right to Life" for Caribbean youth". It was an inter-active discussion in the format of a virtual Forum for the region's youth to discuss the SDGs (especially # 3, 13 and 16) and the threat of climate change to their "right to life." The second was held on February 7, 2019 with the theme "Climate change impacts to the Caribbean and the attainment of the SDG'S: the importance of involving youth" and focused on SDGs #2, 3, 6, 8, 9 and 13. It was an inter-active virtual discussion for the region's youth to discuss SOLUTIONS & ACTIONS as to how to attain the SDGs in an increasingly climate change impacted Caribbean, given that estimates show an augmentation in droughts, floods, catastrophic hurricanes, epidemics etc., by as early as 2030 if global superpowers don't drastically reduce their carbon emissions. In addition to the international framework of the SDGs, the Corps ensured it aligned with the Caribbean Community (CARICOM) Youth Development Action plan endorsed by the governments. The Forums were designed to mobilize students to obtain answers, give recommendations and solutions and interact with leading climate change experts like UWI Professor Michael Taylor, lead author of the Special Report on Global Warming of 1.5 degrees by the Intergovernmental Panel on Climate, Dr. David C. Smith, Director - UWI Centre for Environmental Management. Over 700 youth participated in the two Forums. In 2019 the solutions and recommendations from the Forum were passed on to the CARICOM Secretary General for discussion at the Heads of Government Meeting in July 2019 to underscore the willingness of Caribbean youth to be involved in the challenge of climate change. A network to mobilize students: UWI STAT Climate Change Advocacy Network (UWI STAT CCAN) was established (sign up link <https://www.uwi.edu/alumnionline/uwi-stat-climate-change-advocacy-action-network> ); and an UWI STAT CCAN E-Newsletter is circulated.

## Tech evolution of the education system in Pakistan

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**Abstract:**

**The Question**

“With the literacy rate of 58% (2015-16), unaffordable and obsolete education system, how open/online education can revolutionize the concept of quality and affordable education in Pakistan?”

This is the era of technology, with rapid changes taking place across the globe. Technology is replacing human labor in various fields, and to some extent, even controlling human needs and behavior. Today, humans need to constantly learn and equip themselves with the latest updates in the information and communication methods. Technology is even changing the structure of the social institutions. One big change in the social institutions has been observed in the Education sector, where internet has become an essential role-player in providing an inclusive and enhanced academic experience. This report aims to study the inevitability of technology-education collaboration, situation of Pakistan’s education system and the extent of success of online education in Pakistan.

## Comparison of sustainable lifestyles of university students based on cultural characteristics in different geographical regions

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**Abstract:**

Sustainability has become one of the major issues that has to be taken into account in universities worldwide. In this paper, environmental sustainable lifestyles of university students in Turkey and selected East Asian University were assessed. SWOT analysis based on social aspects was carried out as a first step for comparison. In detail, cultural and traditional behaviors of the students was assessed in terms of sustainable life style by a questionnaire based survey. The answers were analyzed by using SPSS (Statistical Package for the Social

Sciences). The results of sustainable lifestyles, road-map for future sustainable campus program together with challenges based on regional characteristics are presented in the study.

## Meaningful Partnership: design as social and sustainable innovation

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### **Abstract:**

Community design projects in the architectural and interior design studio education often allude to service learning. In theory, such design-service efforts would directly impact the neighborhood we belong making meaningful connections, and they also benefit students with the real-life experience within the academic curriculum. While this sounds like a win-win situation for both design programs and community members, meaningful community-engaged learning remains challenging as the economic, social, and environmental issues to achieve sustainable built-environment continuously expand. There are still many limitations within the academic perimeter: duration of academic schedule, the capability of the students, knowledge within the design program to fulfill the extents of the community design needs. Thus, a design collaboration between academic programs would strengthen the value and overcome one's weaknesses to provide realistic design response that the community could engage.

Meaningful Partnership as a design studio course reflects the collaboration beyond community and design education extending the cohesion of partnerships among disciplines of the built environment. The Meaningful Partnership project is a joint research and studio effort between design and sustainable construction management studios that allows our students to reach out to the community. This project facilitates an understanding of the students regarding the social and environmental challenges faced by the residents of our local community. Projects that are underfunded or conceptual plans addressing the economic, social, environmental, and political objectives inherent in the concept of sustainable development are particular interests in this interdisciplinary research. This paper focuses on a residential project in partnership with a local refugee housing agency that rehabilitated two vacant houses into transitional refugee housing for newly arriving families in 2018. Using the abundant academic resources on environmental and interior design and sustainable construction management that are available from the two programs, this project provided innovative responses to local challenges and served the public through design. This paper posits that design as a social and sustainable innovation can bring positive change, and design education is a place to establish a commitment to social responsibilities.

## The contribution of the Institute of Science and Technology for the formation of an international sustainability regime: a practical-theoretical model of sustainability assessment.

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**Abstract:**

The present article seeks to verify the contribution of the Institute of Science and Technology (IST's) as partner institutions for the formation of an international sustainability regime, which is related to axis 17 of the Sustainable Development Objectives (SDG) - "Partnerships", proposed by the United Nations. Thus, the work intends to show the ability to build internationally shared reference frameworks for sustainability in the higher educational environment. The existence and sharing of networks, rules and guidelines to follow international practices shows the formation of an international sustainability regime promoted also by IST's. The research develops a practical-theoretical model of sustainability assessment for IST's that considers the concerns of said regime and, for this, combines the GRI (Global Reporting Initiative), A3P (Environmental Agenda in Public Administration - Brazil) and ISCN (International Sustainable Campus Network) guidelines metrics in the construction of a single model. In this sense, the article has the following specific objectives: to verify the conceptual and historical trajectory related to sustainability, based in particular on the Theory of International Regimes, in order to understand the emergence of SDG (Sustainable Development Goals); to combine the aforementioned guidelines into a single sustainability assessment model (SIAS / ICT), and to analyze how sustainability is promoted internationally by IST's. The methodology, in its objectives, is considered descriptive and exploratory. With regard to the technical procedures, it adopts a multi-case study in different IST's and literature review. In the case of problem approach, the research is qualitative and quantitative. The methodology follows three phases: theoretical framework and conceptual approaches; proposition of a practical-theoretical model of sustainability assessment (SIAS / ICT) structured in the questionnaire format. At the end, it is possible 1) to evidence the formation of an international sustainability regime promoted by IST's, considering the SDG's, especially related to axis 17 (Partnerships), 2) what is the effective participation of ICT's in this regime through 3) the achievement of a quali-quantitative organized system of questions for the evaluation of sustainability in ICT's, which can be used in different entities of the Higher Educational sector.

## Innovations for Sustainable Development

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**Abstract:**

Introduction: On 1st January 2016, the 17 Sustainable Development Goals (SDGs) for the 2030 Agenda for Sustainable Development that was adopted by world leaders in September 2015 at an historic UN Summit- officially came into force. And over the next fifteen years, with these new goals that are to be universally applied by all, countries will mobilize efforts to end all forms of poverty, fight inequalities and tackle climate change, while ensuring that “No One is Left Behind”.

However, in spite of the splendor of the historic moments, and the wonderful 17 proposed global goals, we must say that the Sustainable Development Goals- (SDGs) needed to have visible grass-root touch and be more flexibly linked to the common stakeholders/right holders of the world populace especially the campus communities for a transformative change. If critically consider, this link is somehow missing perhaps due - on one hand, to the sophisticated nature and language of the UN documents as well as the processes of transmitting the global vision to the world people.

The SDGs represents some of the smartest interventions the world has ever had. And actually, the SDGs with their broader vision of 169 targets with an all comprising mandates are supposed to be interlinked with every other goal and relate meaningfully to the current social economic structures and concepts. Life is a complex multidimensional phenomenon and so must be our solutions to conserving it. The SDGs, as they are, will seem to conflict not only with the current economic structures, but also many of the concepts steering our realities and general life challenges. But the most urgent question are- How are the SDGs going to be addressed and applied in terms of practical poverty and hunger eradication? Inequalities and injustices eradication? Industries and Infrastructural Innovations provision? And most importantly, how are they supposed to represent practical solutions for Education, climate issues and communication challenges of our time?

Thus, in order to bring a more visible and sustainable development movement, the campus communities through our universities system must need to innovate on new areas of discipline.

In this way, we can be sure that “NO ONE SHALL BE LEFT BEHIND.”

Hence the introduction of the course on INNOVATIONS FOR SUSTAINABLE DEVELOPMENT has the capacity of transforming the higher education sector towards accelerating the Sustainable Development Goals implementation.

This dimension is like a catalyst to attaining the 2030 Agenda. Here, we try to imagine what the world could be in 2030 if all students in our ivory towers are taught and become masters of sustainable development through innovative approaches?

#### AREA OF FOCUS

To achieve this and transform the higher education system and accelerate the SDGs implementation, this discourse shall be looking at how to inculcate such relevant knowledge and skills on the students' communities as:

- 1- The why and how of Innovations for sustainable development
- 2- What are innovations and who is an innovator?
- 3- The dynamics of Innovations in Sustainable Development
- 4- Definition of Sustainable Development, the SDGs and the 2030 Agenda
- 5- The practices and act of Inno-native designs ( Innovations on indigenous resources and technology including health care practices)
- 6- Innovations in Digital Edu-Preneurship Technology-(Digital Vocational Entrepreneurship Education) for sustainable development,
- 7- Innovations in Agroecology and Green economy for sustainable development
- 8- Innovations in environmental technology and renewable energy for checking the climate change challenges
- 9- Innovative approaches towards achieving Gender responses and inclusive development,
- 10- Innovations in projects funding and strategic management
- 11- Innovations in partnership and networking towards to achieving the Global Goals
- 12- Developing Innovative skills for turning the Global Goals into local sustainable businesses-SDGs-Preneurship

13- The use and deployment of the PFC- Pre frontal Cortex in generating and developing innovations for sustainable change and transformation

14- Practical discussion and interactions on innovations for sustainable development. Details on these vital subject areas and sub-topics shall be provided during discussion and presentation or on request.

15- Further reading and resources could be accessed from the book and materials on A B C ON SKILLS FOR THE SDGs-PRENEURSHIP- How to turn the Global Goals into local sustainable business by Amos Obi at <https://www.amazon.com/author/amosobi> OR <https://www.youtube.com/c/AMOSAOBI>

## Setting agenda for sustainable education for national development in Nigerian universities

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### **Abstract:**

Developments in the society have their compost roots in the researches being carried out in the universities world over. Industries and hi-tech companies all invest in researches with the view of having a cutting-edge advantage over their competitors. This translates to the need for serious investment in the education sector being the hub for these researches. While some governments across the globe invest heavily in the education sector of their countries, the Nigerian government merely provides 'maintenance' fund for education development. In other climes, the private sector and individuals invest heavily in education and their profit comes in terms of the scientific discoveries which research churns out for the advancement of humanity. Within this context, most universities in the world have committed themselves to the principles of sustainable development goals. With the adoption of the National Education Policy in Nigeria, one would think that the education sector would receive due attention from the Nigerian government but over the years, it is clear that the Nigerian government has not shown much commitment to the realization of these goals beyond lip service. It has not provided seed fund to the universities or its research centers for any major research on the SDG goals. This impacts negatively on the university system because of lack of funds to pursue such lofty dreams. It is against this background that this paper examines the structure of Nigerian universities' curriculum in the light of the SDGs. This paper, through discursive analysis and comparative methodology, examines the various steps available to the Nigerian universities from the ideas of SDGs and towards the realization of the SDGs. It avers that the goals

themselves are springboard of ideas which must be studied and internalized. The universities must not wait for the government before incorporating these ideas into their curricula. Committees and mission groups must be established to engender the development that can plunge the system into realistic goals. The paper finds that both private and public universities have to collaborate on this and set aside the politics of ownership and control of universities in the educational system. It concludes that notwithstanding the tardiness of the government, the universities could extricate themselves and be buffers of development if broadly teleologic in their aspirations for sustainable education.

Keywords: Education, researches, sustainable development goals, university, sustainable education.

## Practical methodologies for a University Seminar Entitled: Sustainability in The University-Actions for the 17SDGs

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### **Abstract:**

From Academia there is an urgent need to accelerate actions to disseminate the SDGs, since they have not reached all educational levels. There are more and more courses on the SDGs but the methodologies for their teaching are very dispersed and not available to everyone. Here we present different methodologies and exercises within a seminar where training and monitoring of teaching experiences defining one's own experimental thread as to SDGs in the university environment are taught.

The approach of the seminar is based on the following premises:

- To learn the SDG framework theory is not enough, experimentation and personalization of the message is necessary.
- To work with the SDGs, one must first know their origin and framework.

- Personal experience has an important weight in a methodology that seeks the connection and contact with the essential.
- Each person can, regardless of their condition and experience, work and live the message of the SDGs.
- The university is an adequate space to disclose the SDGs for its commitment to the social, economic and environmental improvement of the planet.

The SDG framework is used because there is an urgent need to provide students, and therefore, society, with instruments and means to implement the 2030 Agenda. All institutions, including academic ones, need the SDGs to elaborate their responsibility and commitment to the global challenges.

The SDG framework was used to structure a course around the teamwork process that requires in each phase a practical learning, where the student acts and reflects in such a way that everything leads to the development of collaborative projects involving students and teachers. The SDG framework was used to emphasize the social responsibility of the HSD for the future and present professional fields of the student body. SDG 17, linked to the construction of alliances and partnerships, works transversally throughout the seminar.

The implementation of the SDGs framework has an organic growth. The seminar lasts 3.5 hours every Wednesday for four months. It takes place in different settings of the HSD: gymnasium, theater, corridors and classrooms.

In a first phase, SDGs are worked on individually, making students experience and live them in their daily life. Subsequently, group dynamics are worked on and, finally, students work concrete and tangible actions related to the SDGs under the banner of "Teams", aimed to impact groups and communities.

Methodologies and actions as:

- Student self-experiment: Implementing SDGs in daily life for a week
- Brainstorm around the SDG in relation to the complexity of everyday issues.
- Reflection work: What can be done or changed in everyday life to implement the 17 SDGs?
- Workshop on Integration of the SDG in daily professional work life.
- Work in "Teams" with tangible actions that aim to impact the group and the wider community. Examples: "Maintenance of the HSD's Givebox", "Christmas party for the SDGs",

"Publication of a 20-page booklet on "Sustainable and second-hand consumption in the city",  
"A piece of work to disseminate experiences of food-sharing and solidarity food.

## Living an SDG-Friendly Life: Emboldening Higher Education Students

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### **Abstract:**

For many higher education students, on-campus residence represents the first opportunity to forge an identity and lifestyle independent of one's home family and community. This time of life represents an critical inflection point not only to educate students on the existence and specifics of the SDGs, but to encourage students to make SDG-friendly choices in their day-to-day lives. The University of Notre Dame supports student education in sustainable development through an undergraduate minor, an undergraduate supplementary major, and a graduate track within the Global Affairs degree. Undergraduate students within the core course Introduction to International Development Studies are introduced to the SDGs framework through in-class educational activities and class assignments. In an effort to deepen student understanding of and engagement with the SDGs and to make them more real to their lived experience, students were immersed through an in-class participatory session to think through and propose ideas about how students could support the SDGs framework through efforts in Awareness, Advocacy, Action, Invention, and Innovation. Students generated a list of 56 opportunities within these areas that could be actionable as an individual or as a class. Universities should not only encourage such reflection, but also identify ways to incentivize implementation of such ideas. There is much more that could and should be done to make the SDGs not only a framework for global development, but for individual and group lifestyle choices.

## People in Nature, Nature in People: An Ecosystemic Approach to Advocacy, Public Policies, Research and Teaching Programmes

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### **Abstract:**

In view of environmental conditions, quality of life and the state of the world, an ecosystemic approach is posited to define and deal with the problems in the core of the "boiling pot", where

the problems emerge, instead of reducing them to the 'bubbles' on the surface (effects, fragmented, taken for granted issues).

Contrariwise to disjointed public policies, teaching and research reduced formats, tendentious media communication and advocacy, the ecosystemic approach addresses the general phenomenon, the state of the world; quality of life, ethics, biocultural, environment conditions are considered altogether.

Instead of taking current prospects for granted and projecting them into the future (exploratory forecast), the definition of desirable goals (normative forecast), and the exploration of new paths to reach them is founded on the understanding of the dynamics that create and sustain lock-ins and barriers to change.

In the ecosystemic approach, all dimensions of being in the world (intimate, interactive, social and biophysical) are combined in the diagnosis and prognosis of the problems, in view of their complementarity and mutual support, as they intermingle to elicit the events and organize for change.

The key challenges are conceptual, more civic and political than technical: conceptualize sustainability from a holistic, interdisciplinary approach; support a long-term strategy based on political, economic, environmental and societal commitments towards new dynamics of global governance.

Institutional capacity, judicial neutrality, informational transparency, social spaces for civic engagement are the main factors to assign public resources to conservation programs and policies in view of the framing of different values (use vs. preservation; ecosystem services vs. species).

In view of drought, desertification and land degradation linked to mega projects with intensive use of resources, how to deal with business corporations that can "choose and impose" the path to follow, whereas common citizens cannot do so due to the asymmetries of power between legal persons and natural persons?

In the ecosystemic approach, socio-cultural learning niches (as new structures, protective spaces for "path breaking innovations"), develop awareness, interpretation and understanding beyond established stereotypes, "shielding, nurturing and empowering", in view of a thematic ("what"), an epistemic ("how") and a strategic (when, who) point of view.

The proposal favours societies which invest in each other, in view of new forms of being-in-the-world, not in mega-projects with intensive use of resources. Scholars, academicians, students, activists, policy-makers and practitioners should work together to develop and implement new paradigms of growth, power, wealth, work and freedom to be embedded into the cultural, social, political and economical institutions.

Challenges are conceptual, more civic and political than technical; the proposal extends to environmental problems, quality of life and the state of the world a larger conceptual framework encompassing ontological and epistemological issues; it highlights how taken-for-granted worldviews, values and perceptions affect the definition and treatment of the problems programmes in the contemporary world.

In view of the ecosystemic approach, advocacy, communication, public policies, research and teaching programmes would:

- a) define the problems in the core of the “boiling pot”, not reduced to the ‘bubbles’ of the surface (effects, fragmented and taken for granted issues);
- b) combine all dimensions of being in the world in the diagnosis and prognosis of events, as donors and recipients; assessing their deficits and assets,
- c) consider the singularity of (identity, proper characteristics) and the reciprocity (mutual support) between all dimensions, in view of their complementarity and dynamic equilibrium;
- d) contribute to the transition to an ecosystemic model of culture in a consistent, effective and enduring way.

## Collaboration of a Master of Science Program to SDG implementation

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### **Abstract:**

The Master of Science in Industrial Engineering Program (Programa de Pós-Graduação em Engenharia da Produção – PEP) in Federal University of Rio Grande do Norte – UFRN, in Brazil, presents Engineering of Sustainability as one of topics of the program. In the field of Engineering of Sustainability had been promoted a frequently evaluation about possible actions related to Sustainable Development Goals (SDG). Professors and students are very interested on develop research related with it. The Master of Science in Industrial Engineering Program of



UFRN started the operation during 1999. Federal University of Rio Grande do Norte – UFRN celebrated during 2018 60 years of operation.

For the development of this research, a diagnosis was made of the master's dissertations presented to the program during 2017, 2018 and 2019. Subsequently, a qualitative and quantitative analysis was carried out to identify which dissertations had some nexus with specific goal, and indicate the most recurring SDG. The second part of the study consisted in the suggestion of strategies for the dissemination of SDG in UFRN, starting with the PEP itself, through tools that allow professors and students to become involved and to learn how good practices on sustainability would be operated.

During the three-year study period, 56 dissertations were defended by the students of the program presenting links with the SDG. The goals more frequent in the dissertations were respectively: Industry, Innovation and Sustainability - SDG 9 (31 dissertations); Good Health and Welfare - SDG 3 (15 dissertations) and Quality Education - SDG 4 (15 dissertations).

The survey of the dissertations contributed to identify a more appropriate approach to suggest to the university the commitment and awareness about SDG. In general, both in society and even within the university itself there is a lack of knowledge on SDG. So it is necessary develop actions that explain and encourage practices on the issue, seeking to achieve sustainable development. These actions can be done through courses, lectures, round tables, social media posts and other actions. Therefore, it is important to highlight the correlation between the master's program and the SDG, as well connected with society to eradicate poverty and promote a equality.

A strategic action to be developed by Master of Science in Industrial Engineering Program (PEP) of UFRN is promote communication about how it is happening the achievement of SDGs. Was perceived the possibility of stamp in the front dissertations cover a stamp related to specific SDG discussed. Master of Science in Industrial Engineering Program (PEP) is the first course in UFRN to be explicitly committed to Sustainable Development Goals (SDG). This justifies the PEP as a good example of practice to accelerate SDG Implementation in Higher Education System.

### Challenges of universities inviting society to participate in environmental actions: a case of beach clean up in Brazil

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**Abstract:**

Can be seen as a great challenge create an awareness related to environmental commitment, aspect deeply related to Goals 13, 14 and 15, respectively: climate action, life below water and life on land. How society voluntarily would participate more of environmental actions?

Committed to develop more practical actions associated to implementation of Sustainable Development Goals, the Master of Science in Industrial Engineering Program (Programa de Pós-Graduação em Engenharia da Produção – PEP) in Federal University of Rio Grande do Norte – UFRN, in Brazil, organized on May 1st, 2019, a beach clean up. The action was in Via Costeira beach in Natal – Rio Grande do Norte – Brazil. Professors and students were invited to participate in the beach clean up.

The environmental action started at 7.30am. Was prepared a press release sharing the details of the clean up action. The beach clean up was also convoked using social media and was created a blog sharing more the details about meeting point, etc.

During the clean up action was possible identify a great variety of plastic: PET bottles, bottle caps, plastic bags, cigarette filters, cotton swabs, fuel packaging, ropes, plastic cups, packing of salty snacks and biscuits. Was also found plastic labels of drinking water labels inscriptions in English and Chinese, indicating be an overseas garbage or disposed by a ship in Brazilian coast, an indicator about the plastic pollution is becoming global and threatening the life in the oceans. Was collected more than 30kg and clean up 300 meters of beach sand.

The action received the journalist coverage of local journal Tribuna do Norte (<http://bit.ly/2Y1jOp7>). The action was related to Earth Day celebration (April 22nd), just happening May 1st , because the original day was a holiday. The garbage was destined to a social non-profit recycling organization.

As result, the participants considered very connected the action developed with Sustainable Development Goals 14 - life below water and 15 - life on land. The Goal 14 (life below water) is the greatest worry about incorrect waste disposal (in the beach). Was possible identify a great quantity of microplastic, aspect harming sea animals life. In the Via Costeira beach is common identify some carcass of animals as turtles threaten by plastic pollution. Related to Goal 15 - life on land, Natal presents problems of public of waste collection. Part of this garbage goes to the beach. But the pollution in the beach is more produced by visitors.

It is pertinent reflect how to promote a more fruitful process of community engagement. Looks a deeper problem when the community not present an appropriated mindset committed to environmental agenda. Other clean up actions will be organized trying to create a sense of community engaging volunteers interested in environmental actions.

## University Projects Driven by Sustainable Development Goals to Improve Mayan Communities Welfare

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### **Abstract:**

Universities can help in implementing the United Nations' Sustainable Development Goals (UN SDGs) in poor communities in vulnerable areas, but Funding is a very important factor to carry out social projects. The Autonomous University of Yucatan (UADY, Spanish acronym) incorporated the UN SDGs in its institutional plan and created the Social Projects Department. Courses have been offered for professors who were prepared to propose projects concerning social approaches. They were trained using The Logic Framework Approach (LFA) and the Tree Problem Analysis (TPA) in order to define goals and propose solutions. The university has invited its professors since 2013 to put forward social projects in the most vulnerable zones in Yucatan, supported by the Kellogg Foundation; various projects have been submitted since then. About the regional context, it can be pointed out that the south-east in Mexico is one of the poorest regions; Yucatan State is located in this region. Poor communities in Yucatan have complex problems related to hunger, poverty, education, medical service, hygiene habits, job opportunities, migration to cities and low salaries among others. Their environment is recurrently threatened by herbicides, drought, fires, urban and industrial growth, political problems, and lately, energy related projects. These communities are surrounded by major natural zones with extensive lands, large and green forest which produce oxygen and capture carbon dioxide, water abundance, clean soils, great biodiversity and natural resources. In Yucatan, communities have been established over one of the major deposits of pure fresh water in Mexico which possesses a unique geological karstic formation. Herein a UADY multidisciplinary project is reported which was carried out in a community named 'Yaxunah' a Mayan word which means "the first house" and located 25 km from Chichen Itza. A dialogue was established with the community about the vision of the its future. LFA methodology was used and many work meetings were carried out to determine a good social diagnostic. A TPA was made indicating that a low production of food for self-consumption was the main problem. Causes were identified as lack of access to water, no training, weak organization and collaboration. The main goals to achieve were to train and empower families in clean energies (photovoltaic systems) for water supply and incorporating biotechnology to produce herbicide-free. This project has created a Learning Community among families, professors and students from different disciplines. The results of the project are inter-exchange, reinforcement and enrichment of knowledge; and the respect of uses and cultural customs of communities in the south-east of Mexico. Some advancement has been reached with poor communities in Yucatan, however, the problematic is so complex that it is necessary to attract more funding to create a

major impact in their welfare. Fortunately, Yucatan has about one hundred higher education institutions mainly located in its capital Merida City, with about eighty thousand students in all the state, so projects could be carry out by all of these institutions.

## Surfacing Strategies: Organizational Learning for the Strategic Development of an Agriculture, Forestry, and Fishing Occupational Health and Safety Research and Outreach Center

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### **Abstract:**

In Haaris Saqib's Master of Sustainable Development (MDP) Field Practicum, he worked with the Southeastern Coastal Center for Agricultural Health and Safety (SCCAHS), a Center for Disease Control and Prevention (CDC) research and outreach center addressing agriculture, forestry, and fishing occupational health issues in the southeastern United States. SCCAHS is a multi-disciplinary research and outreach Center based at the University of Florida and with multiple partnering institutions in Florida and Georgia.

Through one-on-one interviews and surveys conducted with the Center's internal faculty and staff, Haaris aimed to surface the Center's strengths, challenges, and opportunities for the less than four-year-old organization. Additionally, Haaris developed similar surveys and interviews for the Center's external stakeholders which are to be administered early in the fall 2019 semester. The combination of both internal and external perspectives is designed to help the organization understand the unique views while surfacing patterns of similarities and differences within them. External participation is uniquely helpful because it allows the Center to gauge how it is perceived by the many other stakeholders it interacts with. Additionally, including external stakeholders creates the opportunity for new and expanded participation in the organization's shared future. Participation by internal and external actors is anticipated to increase the sense of ownership and responsibility for the Center's future.

With the Center's first reapplication on the horizon, this organizational learning activity is anticipated to be highly useful as the Center matures and expands into its catchment area. These organizational learning activities are a part of the early-stage effort to learn about the Center and develop strategic pathways for its future development. Upon the completion of the data collection activities, a Delphi Approach may be utilized to triage the interview and survey findings based on importance. Ultimately, the data collected will feed into the Center's annual retreat in December 2019 where its results will be considered in developing strategic directions for its 2021 funding reapplication.

## Accelerating SDG Implementation in Higher Education with the SDG Dashboard: A Collaborative Reporting, Visualization, and Analytics Platform

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### **Abstract:**

Conference theme 16 addresses the role of higher education in accelerating SDG implementation through best practices in research, teaching, and operations in universities. This theme poses a substantive challenge: How do universities collect and share these best practices to maximize impacts on the SDGs in higher education? Clearly, interest in integrating SDGs into university missions, academics, and operations has increased substantially in recent years (e.g., PRME, SDSN). However, there does not yet exist a collaborative data sharing platform for individual institutional advancement of the SDGs in higher education, let alone any methodology to aggregate data across institutions. Recently, Times Higher Education (THE) unveiled its first SDG-based “University Impact Ranking.” While the THE methodology does collect SDG data from universities, it is not designed to disseminate and share this data—it is a ranking, not a reporting system.

Such aggregated data platforms for SDG impact reporting and best practice sharing do exist for the nation state sector (e.g., SDSN’s “Sustainable Development Report,” UN’s “Sustainable Development Goals Report”) and corporate sector (UNGC’s “Reporting on the SDGs”), but not yet for the higher education sector. This poster outlines the SDG Dashboard, a new initiative in the higher education sector aimed at addressing this gap in collecting and disseminating SDG best practices. The SDG Dashboard provides an innovative solution for sharing higher education impacts on the SDGs, consisting of a new reporting, visualization, and data analytics platform for global business schools to showcase their contributions toward advancing the SDGs. The SDG Dashboard aggregates and displays business schools’ SDG-related best practices in the Impact Areas of Teaching, Research, Partnerships, Dialogue, and Organisational Practices.

The purpose of the SDG Dashboard is to provide a shareable, robust, and useful online resource for business schools to enhance their impacts on fulfilling the SDGs. The SDG Dashboard makes three focused contributions to accelerating SDG impact in higher education:

1. Individual universities can benchmark their internal SDG practices and impacts across core functions (e.g., teaching, research). This allows institutions to strategically assess strengths and opportunities for enhancing their focus on the SDGs. The dynamic, interactive visualization platform of the SDG Dashboard generates insights, trends, and other useful analytics.

2. Because the SDG Dashboard collects and makes available data at the granular level through live web-linking—scholarly publications, conference papers and presentations, course syllabi, program descriptions, policy statements, press releases, organizational functions, etc.—best practice sharing and adoption amongst institutions are easily facilitated.

3. In the SDG Dashboard, data for SDG Impact Areas in higher education are easily cross-tabulated with all 17 SDGs to produce an aggregate visualization of where universities make impacts and where there is room for enhancement. Essentially, the SDG Dashboard is a tool that empowers higher education with current, accessible, and analyzable data to make informed decisions about pursuing and optimizing SDG impacts, accelerating SDG implementation across all higher education.

To note, presently the SDG Dashboard is open to university business schools, but can easily be extended to entire universities as well.

**Strategic Alignment and Information Technology: the impacts of the increasing use of Information Technology (IT) to the transformation of Higher Education related to the sustainable development.**

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**Abstract:**

The present article seeks to verify the impacts of the increasing use of Information Technology (IT) to the transformation of Higher Education allied to the strategy management of Universities - Strategic Alignment (SA). In this way, the focus is on optimizing internal procedures in the search for strategic objectives that promote and accelerate sustainable development in the process of knowledge production. Thus, the article considers the thematic axes 4 (Education and Quality) and 9 (Industry, Innovation and Infrastructure) of the Sustainable Development Objectives (SDG) to approximate the strategic use of infrastructure innovations (IT) to the Strategic Alignment (SA) of Higher Education management, with the oriented-view in the pursuit of the sustainable development of the society in which the University is inserted. Thus, when considering that the linkage of the IT strategy to the management strategy (SA) already is applied to the corporate field, it becomes fundamental to analyze the application for the

sustainable management of the Universities in their promotion of knowledge. In this perspective, the article intends to work the SA in the scope of university management, based on a case study of the Socioeconomic Center (CSE), one of the 11 research centers of the Federal University of Santa Catarina (UFSC), approaching management strategies to the current technological scenario. In addition, the article observes the effective synergy between SA and IT in the achievement of CSE management goals, such as the use of systems to virtualize procedures with massive use of paper or other initiatives that are directly related to the promotion of sustainable development in its environmental, economic and social areas (triple bottom-line) with an integrated and sustainable university management. In this sense, the article has the following specific objectives: mapping the strategic processes related to the administrative management in the CSE/UFSC and that have the support of IT; characterizing the information technologies used in the CSE/UFSC; verifying relevant factors of the SA of the administrative management that are related to the use of IT for the acceleration of sustainable solutions; identifying potential challenges and sustainable solutions to improve the CSE/UFSC. The methodology, regarding the objectives, is considered descriptive and exploratory. With regard to technical procedures, the bibliographic research and case study are adopted. Regarding the problem approach, qualitative. The methodological trajectory follows in three phases: theoretical framework and conceptual approaches regarding the Strategic Alignment of the organizations and use of information systems, with emphasis to the university application; characterization and mapping of strategic processes of the CSE/UFSC with relevance to the IT area; identification of challenges and potential solutions for the acceleration of sustainable solutions under the CSE/UFSC. At the end, it will be possible to highlight the use of information technology (IT) innovations that corroborate the Strategic Alignment of the CSE/UFSC management, based on sustainable criteria (SDG).

## Effectiveness of non-formal educational institutions for inclusive community development Quetta, Pakistan

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**Abstract:**

Issue

Formal education system is not in such capacity to architect HRE in our society. In order to bring

social change in any society, grass root level civil societies could play a vital role in human rights promotion and protection. In this regard, around 13 youth-led educational institutions have been working in education, ICT sectors for promotion of peace education, non-violent social behavior change, human rights development to youth (12-35 age grps) in Quetta. Lack of proper educational system lead the youth towards extremism and violence.

### Methodology

These have been providing formal, non-formal education, IT training, awareness on HRE. The programs are designed to involve youth male/female from diverse communities for behavioral change, leadership, sustainability; entrepreneurship & HR awareness. Educational experts, intellectuals, NGOs members are invited to project concepts on peace education, social democracy, community participation, human rights promotion & development.

### Program intervention

Information on social change, sustainable development with literature on positive citizenship, teacher-students meeting, inters debate competition, social gathering with community leaders, cultural activities and workshops on inclusive community development.

### Recommendations

These institutions are making positive impact enabling the youth for pro-active participation in HRE, community and social activism thus minimizing communal violence at family and community level. For more meaningful involvement of positive youth needs on-going process and resources. Follow up efforts will be directed towards the formation of positive youth groups. They shall be able to provide peer support and replicate the acquired skills, once trained in GCE.

### Key words

Youth empowerment, vulnerable groups, refugees, ethnic minority, sustainable development





Launched by UN Secretary-General Ban Ki-moon in August 2012, the Sustainable Development Solutions Network (SDSN) mobilizes scientific and technical expertise from academia, civil society, and the private sector in support of sustainable development problem solving at local, national, and global scales. We aim to accelerate joint learning and help to overcome the compartmentalization of technical and policy work by promoting integrated approaches to the interconnected economic, social, and environmental challenges confronting the world. The SDSN works closely with United Nations agencies, multilateral financing institutions, the private sector, and civil society. [unsdsn.org](http://unsdsn.org)



Association of the Master's in Development Practice (MDP) programs is a network of 38 MDP programs, each committed to a high-intensity program of teaching, research, innovation, and practice that involves all parts of the world. The Global Association arises from a shared commitment to forge a new profession of sustainable development practice that integrates the social sciences, natural sciences, health sciences and management. Intellectual foundational support was provided in the 2008 report of the International Commission on Education for Sustainable Development Practice, supported by the MacArthur Foundation. Numerous universities have or are in the process of designing, introducing, and promoting the new, cross-disciplinary global Master's in Development Practice program. In order to function effectively as the Global Association of the Master's in Development Practice, the Association is guided by bylaws that define its purpose and responsibilities. [mdpglobal.org](http://mdpglobal.org)

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