2015 INTERNATIONAL CONFERENCE ON
SUSTAINABLE DEVELOPMENT

Thanks to Our Sponsors:

DIAMOND

Dr. Betsee Parker

PLATINUM

Ceil and Michael Pulitzer

GOLD

PEPSICO

SILVER

Kapuscinski Development Lectures

BRONZE

Munich RE
2015 INTERNATIONAL CONFERENCE ON SUSTAINABLE DEVELOPMENT

Contents

ORAL PRESENTATIONS.................................................................................................................. 2
    Arab region: Challenges and prospects of implementing the SDGs ........................................ 2
    Accountability and Evaluation........................................................................................................ 8
    Agriculture Food Security, & Nutrition......................................................................................... 25
    Climate Change and Access to Energy.......................................................................................... 29
    Examining the Science-Policy Interface....................................................................................... 50
    Education .................................................................................................................................. 51
    Ending Extreme Poverty ............................................................................................................. 75
    Financing for Development ......................................................................................................... 85
    Governance (Including Peace Building & Justice)......................................................................... 94
    Greening Cities ........................................................................................................................... 99
    Health ......................................................................................................................................... 107
    Inclusive Economic Growth / The Role of Business ................................................................. 117
    Indigenous Communities and Sustainable Development .......................................................... 128
    OECD New Approaches to Economic Challenges (NAEC) and the SDGs............................. 134
    Planetary Boundaries (Including Biodiversity/Ecosystem Services) ......................................... 135
    Scientific Collaboration to Achieve Affordable, Sustainable Energy for Humanity .................. 141
    Social Inclusion (Including Gender & Human Rights) ............................................................... 142

POSTER SESSION ...................................................................................................................... 152
    Accountability and Evaluation........................................................................................................ 152
    Agriculture, Food Security & Nutrition ....................................................................................... 155
    Cities & Human Settlements .......................................................................................................... 167
    Education ..................................................................................................................................... 168
    Ending Extreme Poverty .............................................................................................................. 171
    Financing for Development .......................................................................................................... 173
    Governance (Including Peace Building & Justice)....................................................................... 175
    Health ......................................................................................................................................... 183
    Inclusive Economic Growth / The Role of Business .................................................................. 187
    Planetary Boundaries (Including Biodiversity/Ecosystem Services) ......................................... 195
    Social Inclusion (Including Gender & Human Rights) ............................................................... 201

Abstracts presented in this book are as submitted by the authors, with slight formatting edits. They have not been copy-edited, and authors are responsible for any errors.
ORAL PRESENTATIONS

Arab region: Challenges and prospects of implementing the SDGs

Abu-Ismail, Khalid
United Nations Economic and Social Commission for Western Asia (ESCWA), Lebanon, abu-ismail@un.org

"Looking into the new development paradigm: How does the Arab region fair against others?"

The conventional wisdom is that many Arab countries have witnessed a major transformation in socioeconomic development since the early 1970s led by the oil rich countries. Accordingly the development stylized facts on the region covering the period from the 1980s to 2010 would typically include the following: (i) relatively high but volatile growth; (ii) low poverty, inequality with a broad middle class, (iii) rapid improvements in human development especially in health and education, and (iv) curtailed voice and limited political freedoms.

The presentation will show that these development facts are highly sensitive to the choice of measurement methodology and that alternative stylized facts may emerge once we adopt ‘more realistic’ measures. This is clearly the case when the issue involves the measurement of human development. Human development, while clearly dependent on material welfare and the provision of the basic necessities of life, is really about people having greater opportunities and choice. It is also fundamentally about creating a society in which human dignity is respected and human agency is promoted and is thus inherently in contradiction with situations of mining of environmental assets and denial of basic human dignity.

The global HDI although revolutionary in leading us to rethink human development progress, does not incorporate these fundamental aspects of human development achievement. In this paper we introduce three new measures, which take into account these missing elements. In fact, some of the very countries experiencing upheavals were leaders in developing regions in terms of HDI improvements between 1970 and 2010 (Abu-Ismail et al. 2011). Using this region as a case study, we make subsequent revisions to UNDP’s HDI by first amending the income component of HDI, followed by the addition of a measure of governance and finally an environmental component. With each addition, we analyze the country shifts in score and ranking from previous iterations and detail our specific methodology for choice of variables and measurement. We conclude with an analysis of how countries perform over time under our new measure in comparison with the time dynamics of the original HDI. The new measures significantly affect
Arab human development levels and their country rankings. In addition, the narrative on Arab human development dynamics is less rosy than painted by the UNDP HDI.

**Al-Barghouti, Tamim**  
United Nations Economic and Social Commission for Western Asia (ESCWA), Lebanon, al-barghouti@un.org

"Institutions and political dynamics in the region: Evolution, present and future scenarios"

In a world where population numbers are unprecedented as well as the ability of such populations to intercommunicate, new forms of political and military organization arise, rendering old forms irrelevant. This is especially true in the Middle East today.

There is a meltdown in the Political order south of the Mediterranean, and in some areas there is a meltdown of the social order as well. Every regular army in the region, engaged in fighting, is either defeated by a militia or is spared defeat by the help of one. Centralized, hierarchal organizations based on coercion and conscription, be they armies, police forces or entire states, are giving way to non-hierarchal, decentralized networks based on conviction, be they peaceful demonstrations or armed movements.

The nation state system in the Arab World was born with a set of structural contradictions; on the one hand states were created by the colonial powers in the early decades of the 20th century as guarantors of colonial interests. On the other hand, they were expected by their own populations to achieve the national aspirations of independence and progress. Arab nation states needed to cooperate with unpopular colonial powers to gain international recognition, and needed to resist those very powers to gain local legitimacy. To complicate matters further, such states needed the legitimacy of resisting colonialism for their cooperation to be of any value. Their nominal resistance was the precondition for their actual cooperation and the actual dependence was the precondition for their nominal independence. Their sovereignty was the sign of their servitude.

Furthermore, in the aftermath of World War I, a Caliphate (In theory, a state for all Muslims) was defeated and eventually abolished, to be inherited by secular nationalist entities. Yet, one of those entities was destined, and designed, to become a Jewish State (In theory a state for all Jews).This put the new secular Arab states in the region under much strain from religious social forces.
A century of accumulated defeats, starting with the Franco-British mandates and ending with the American wars in Iraq in 2003, with a series of defeats in wars with Israel in between, has resulted in a serious loss of confidence in the colonially created nation state as a viable form of human organization in the Arab World. The current turbulence in the region has witnessed the replacement of states with other entities as means to conduct war and manage peace.

Intini, Vito
United Nations Economic and Social Commission for Western Asia (ESCWA), Lebanon, intini@un.org

"Social justice, inequality of opportunity and their perceptions in the Arab Region"

Social and political upheavals in the Arab world have raised questions about the sources of public dissatisfaction with social justice, despite the overall low level of income inequality. Understanding inequality and its determinants is crucial for policy reforms and fighting poverty in Arab countries. The low level of inequality in the Arab region reflected by low values of the Gini index may hide severe regional inequality and intergroup inequalities. Above a certain threshold, inequality undermines growth and poverty alleviation efforts. Inter-group inequality is important in the Arab region and may yield to inter-generational transmission of inequality. Hence, the eradication of inequality and poverty has become a necessity especially after the Arab uprisings. The presentation will aim at showing measurement of inequality among the different geographical areas and socio economic groups in order to estimate the effect of circumstances people live in on overall inequality. The presentation examines the wealth differentials between rural/urban, female/ male head, uneducated/educated head and unemployed/employed head. Differences in households’ endowments, such as human capital, socio demographic characteristics, households’ characteristics and geographical location, are included in the model to examine the main factors affecting the wealth differentials between the different groups. It has also been suggested that high inequality of opportunity (IOp) could offer insights into a better understanding of public discontent with the status quo. Some studies have measured IOp in different sectors including education and its trend over time in the Arab region. This presentation aims also to update the literature by using more recent data and from different angles, including perceptions of the Arab citizens on social justice and inequality of opportunities. The presentation will also show the findings deriving from a method proposed by Roemer (1998) that allows to estimate the inequality of opportunity in education as the share of inequality in educational outcome accounted for by factors beyond student’s control.
(e.g., circumstances). It will also compare the findings across countries and over time. Finally, the presentation will report opportunities for the so-called early childhood development (ECD) in thirteen countries across the Arab region. Early childhood development is evaluated using a number of indicators for mothers’ care during pregnancy and child delivery, as well as children’s access to minimum nutrition, health, parental care and developmental activities, using standardized national surveys from thirteen countries. We find that children in most of the countries receive inadequate access to qualified prenatal and delivery care, many fail to be properly vaccinated or receive adequate supply of iodine, and disproportionately many of them suffer from stunting, underweight and wasting.

Majdalani, Roula  
United Nations Economic and Social Commission for Western Asia (ESCWA), Lebanon, majdalani@un.org

“The 2030 Agenda for Sustainable Development: An Arab Regional Reading”

The 2030 Agenda for Sustainable Development as it was issued on 2 August 2015 responds in varying degrees to the concerns and needs of the Arab region. For example, while the global community re-committed to the “full realization of the right of self determination of people living under colonial and foreign occupation”, sustainable development goal 16 failed to include an explicit target on ending all forms of foreign occupation. Refugees are recognized as vulnerable groups; however, no specific target was formulated that addresses their sufferings. The agenda re-committed to the principle of common but differentiated responsibilities, although implementation of the principle remains challenging and obscure. Commitment to support middle income countries is a welcome recognition of the challenges faced by this country group in the region. Yet, a stronger commitment from developed countries to the provision of adequate means of implementation is yet to materialize.

The new 2030 agenda is different from its predecessor in a number of ways. The scope of the agenda is wider and the goals reflect clearly the interlinkages between the different pillars of development. The SDGs are formulated in a way that clearly aims at policy integration. In addition, the agenda is universal and country-driven, with member States taking the driver’s seat and having to rely mostly upon their domestic resources for implementation. New forms of multi-stakeholder partnerships are recognized, including stronger role for the private sector and other development partners. Finally, the agenda is strong on accountability and recognizes clearly three levels of follow-up and review at the global, regional and national levels.
The Arab countries will need to rise to the challenge of implementing this complex agenda through a higher level of preparedness. At least three levels of action are foreseen. Nationally, Arab countries will need to translate the global SDGs into pragmatic plans, commitments and actions through the alignment of national strategies and policies. They also need to establish effective and integrated institutional frameworks for sustainable development planning and implementation, including a robust statistical system and an improved science policy interface. Regional integration remains relevant to the implementation of the agenda. In particular, regional public goods need to be identified around which regional programmes of action can be developed and implemented. Finally, a more effective global partnership needs to be developed that will bridge the technology, finance and capacity-building gaps facing the region.

Sarangi, Niranjan
United Nations Economic and Social Commission for Western Asia (ESCWA), Lebanon, sarangi@un.org

"Economic growth, employment and poverty: Future policy challenges for the region"

The Arab region has more worries than achievements on MDGs and other vital indicators of human wellbeing, despite recording considerably high average economic growth in the last four decades. Today, crises and political instability along with shrinking fiscal space for development expenditure has further exasperated poverty in many parts of the region. At a time when countries are preparing themselves to adopt the SDGs next year, a prime concern is to analyse and understand the missing link between growth and poverty reduction.

With this motivation, this study revisits the nexus between changes in economic growth and poverty in the developing economies of the world in general and in the Arab countries in particular? Previous studies such as Son and Kakwani (2004) explained the changes in poverty by taking into account overall economic growth and inequality changes. Islam (2004) rather analysed the poverty impact of growth processes in terms of productivity and employment intensity across sectors. In this study, we employ a strategy combining sectoral growth processes, their employment intensity, inequality conditions and demographic shifts in explaining the nexus between changes in growth and poverty. The exercise is conducted by looking into 355 comparable growth spells of poverty and other indicators of interest, covering 54 emerging and developing economies that have comparable data. The contribution of our study can be summarized mainly in two folds. First: Changes in growth and inequality (both) significantly contribute to changes in poverty, but changes in inequality turn out to be the single largest factor
on impacting poverty measures, given other things constant. The inequality impact coefficient declines as the poverty threshold increases. Further, inequality changes offset the poverty reducing growth effect during the periods when countries experience increase in poverty.

Second: productivity and employment intensity of growth component matter in poverty reduction, a result that confirms earlier conclusion by Gutierrez et al 2007. In addition, our results confirm that the productivity and employment intensity in manufacturing and in higher value added services sectors such as wholesale trade and transport that are more likely associated with emerging market and developing economies contribute significantly to poverty reduction. Nevertheless, inequality is the single most factor that accounts for high impact on changes in poverty.

Therefore, a combination of policies targeting shifts in economic growth composition and redistribution is important for poverty eradication in the context of the SDGs. This is relevant for the Arab countries in particular where a large section of people are deprived of access to social protection insurance, such as health care and pensions. The informal sector is an enormous part of the region’s economy and comprises the majority of working heads of middle class families. Natural resource-led growth has ignored high value added productive sectors and undermined private sector development, which resulted in low productivity, large informal sector and other undesirable labour market outcomes.
Accountability and Evaluation

Amesheva, Inna
PhD Candidate, The University of Hong Kong, Hong Kong, i.amesheva@gmail.com

"The Long Way to Paris and Beyond: A Method for Determining Intended Nationally Determined Contributions"

Forging a global climate change deal at the 21st Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) in Paris 2015 is no longer about merely determining countries’ greenhouse gas emissions reductions. A myriad of other factors do come into play and indeed represent the turning point in reaching a viable agreement. These largely revolve around financing and allocation of responsibility, testing the limits of global co-operation. An effective climate change abatement and adaptation framework would serve to allocate historical responsibilities, but also secure a better future for all, irrespective of economic development status.

The climate change and environmental degradation hazards present not only a challenge but also an immense opportunity to pave the way towards a sustainable legal and economic framework for the 21st century. Indeed, there exist numerous incentives for developing countries to benefit from a first-mover advantage in adopting efficient technologies – foregoing the switching costs that industrialised economies have had to incur in a transition to a renewable energy economy. On the other hand, COP 21 presents a unique opportunity for industrialised states to ‘come clean’ and recoup the climate debt they have amassed since the Industrial Revolution. Yet, the developed-developing country distinction is no longer appropriate in resolving the impending issue of catastrophic climate change. This was demonstrated by the USA-China ‘deal’ that was struck by the world’s largest greenhouse gas (GHG) emitters in November 2014. The bilateral agreement stipulated that both China and the United States are committed to reducing their GHG impact, breaking the existing stalemate whereby it was claimed by some states that it should be only developed countries that have an obligation to reduce their emissions. Thus, even though the Obama-Jinping deal was not a breakthrough in terms of the actual emissions targets, it provided the necessary momentum and affirmation that all countries in the world should come together to achieve a workable solution to the climate crisis.

The paper will provide a framework for determining the Intended Nationally-Determined Contributions (INDCs), which all COP parties are to issue ahead of the December 2015 Conference, along with national adaptation and mitigation plans to be announced by the spring of 2015. The
decision to provide states with the right to decide on their own commitments is commendable as it is likely to be more effective than an externally-imposed top-down obligation. However, there is also the danger that leaving such broad discretion to member states could evolve into yet another responsibility-avoiding exercise. Hence, this paper will provide guidelines for equitably determining individual emissions reductions so as to catalyse action. The present study therefore has the objective of resolving the disagreement between emerging and industrialised economies as regards their involvement in climate change reduction. More importantly, it reconciles environmental commitments with the right of developing countries to achieve economic sustainability. The suggested proposal aims to overcome the challenges created by the current climate change regime by providing greater incentives for both developed and developing countries to participate.

Carraro, Carlo; L Campagnolo, F Eboli, L Farnia
Full Professor of Environmental Economics, University of Venice; Director of Research, FEEM, Italy, carlo.carraro@feem.it

"Assessing Sustainable Development Goals"

Some challenges need to be addressed in order to help ensure the effectiveness of the overall strategy lying behind the UN Post-2015 Sustainable Development Goals (SDGs), building upon the previous Millennium Development Goals (MDGs) experience. The first is to strengthen data collection and monitoring, by connecting international institutions identified as responsible for data gathering with national agencies. The second, related to the main conclusion of 2014 MDGs Report - that acknowledges substantial progress in 2000-2015 but claims for failure in fully achieving most targets - is to establish a consistent overarching policy framework to fulfil SDGs matching.

The present paper proposes a new methodology to perform an ex-ante assessment of the SDGs, such to anticipate potential failures by 2030 and acting promptly. The analysis is based upon the employment of a recursive-dynamic macro-economic computable general equilibrium model extended with a number of relevant social and environmental indicators. The choice of an economy-wide model allows considering changes in relevant socio-economic drivers (GDP per capita, population, prices, outputs, international trade) that constitute the actual landscape in which agents (households, firms) pursue their own objectives (wellbeing, profit). Furthermore, this model-based approach can capture positive and negative feedbacks of the evolution of the global economic system on social and environmental indicators and dimensions.
The analysis starts with a backward overview of current trends of SDGs worldwide, to understand the main reasons for the still existing criticalities. Then, the model-based framework will allow characterising the state of the world up to 2030 across different scenarios. In fact, linking indicators dynamics to the socio-economic context will allow the careful and consistent definition of their future evolution in both business-as-usual (BAU) and policy constrained scenarios. The BAU scenarios traditionally depict the development of the socio-economic systems without considering the introduction of new policies. They work as reference benchmarks, as they can highlight in advance which and where SDGs do not reach the 2030 target level or even worsen compared to the present. Policy counterfactuals designed to fill the gaps will then provide the ex-ante assessment of costs and benefits of planned actions and strategies aimed to achieve SDGs, as well as their feasibility and potential trade-offs/interactions with other sustainability dimensions not directly considered by the policy intervention. Possibly, a comprehensive composite index will be constructed to measure how countries’ overall sustainability will change over time, thereby providing a world sustainability ranking across scenarios.

**Custer, Samantha; Brad Parks**
Director of Policy and Communications, AidData, USA, scuster@aiddata.org

"AidData Pilot Project"

In the summer of 2015, AidData is undertaking a pilot effort to road-test a methodology that is designed to cross-walk aid flows via the International Aid Transparency Initiative (IATI) and the OECD’s Creditor Reporting System (CRS) to each of the sustainable development goals. Building upon this foundation, AidData hopes to scale this approach to (a) systematically track the full range of SDG funding sources, and (b) analyze how these funding sources are being applied to advance the sustainable development goals and to what effect.

We are aiming to have something modest to showcase in late September in conjunction with the UNGA meetings in New York as a proof-of-concept for how this work could be brought to scale. For September, we hope to have: a road-tested cross-walk methodology; a basic widget visualizing the data from the cross-walk exercise; a publicly accessible dataset and some preliminary analysis of the data to identify patterns and trends in financing for the SDGs as a baseline snapshot.
Dilyard, John  
Associate Professor, St. Francis College, United States, jdilyard@sfc.edu

"How Best to Measure the Sustainability Activities of Corporations?"

Despite the absence of a universally agreed upon and recognized definition of sustainability that can be applied to a corporation, several lists purporting to rank companies in terms of their ‘sustainability’ are being published. One such list, The Global 100 Most Sustainable Corporations, is generated by Corporate Knights, a media, research and financial information products company based in Toronto, Canada through its subsidiary CK Capital. Newsweek also publishes a ‘Green Rankings’ list (adapting and expanding on the methodology used by Corporate Knights), and the Dow Jones has its Dow Jones Sustainability Index. Each of these lists is used by the companies on them (and media) to show that they are being ‘sustainable’. Corporate Knights also is a proponent of something it calls ‘clean capitalism’, which essentially is a system in which the social, economic and ecological costs are factored into a company’s prices and that, through proper reporting, both the company and the market are aware of these costs. Its ranking list, therefore, presumably is one way to bring attention to companies that, at least through one set of metrics, can be considered sustainable.

A look at the Corporate Knights list and its methodology for creating the list, however, causes some consternation. For example, one major criterion is a set of 9 financial and operating tests that measure such things as profitability, operating cash flow, asset usage, liquidity and leverage. These measures gauge more a company’s prospects as an investment than its sustainability from an environmental perspective. And the companies on the list cover virtually all industrial/business sectors, which raises such questions as what makes, for example, a financial services company more sustainable than manufacturing company? That environmental-oriented actions by firms such as reducing their carbon footprint, reducing water usage, or encouraging recycling/reduction of waste are not explicit criteria under is another cause for concern.

It is somewhat safe to conclude, then, that these sustainability ranking lists do not necessarily provide useful or generalizable information about how to really account for and measure the sustainability actions of private companies. As a result, students in my undergraduate ‘Viable Sustainable Businesses’ Honors class at St. Francis College were given the task to develop a more meaningful way to evaluate a company’s sustainability actions. Each student chose a multinational company from the Corporate Knights list and examined in more depth its sustainable development activities. Using the company’s own sustainability and/or corporate social responsibility reports, the students reported on (1) how the company defined sustainability for itself; (2) what actions the company chose in pursuing its sustainability; (3)
how those actions were measured; and (4) what longer term sustainable strategies the company was considering. Because the companies chosen by the students spanned a variety of industries (from pharmaceuticals to automotive to apparel to oil/gas exploration to electronics), commonalities about sustainability across industries could be revealed. This paper and presentation (which will include student participation) will discuss the students’ findings and suggest appropriate accountability and measurement methodologies or criteria for corporate sustainability.

Field, Christina; Amanda Traaseth  
Master of Development Practice Candidate, Humphrey School of Public Affairs, University of Minnesota, United States, field324@umn.edu  
"Measuring Progress: Educational Development for Girls in Kibera, Kenya"

The Sustainable Development Goals have emphasized that education - especially that of young women - is essential to disrupt the cycle of poverty and positively transform communities and nations economically, politically, and socially. The Kibera slum of Nairobi, Kenya is perhaps the largest slum in Africa, and it is a place where girls face especially difficult odds pursuing an education. During the summer of 2015, our team of Master of Development Practice (MDP) students will engage in a fieldwork project in Kibera with the purpose of developing and implementing a program evaluation plan for a tuition-free secondary girls’ school called the Kibera Girls Soccer Academy (KGSA).

Our project partner, KGSA, is dedicated to improving the lives of at-risk and disadvantaged young women by providing free secondary education, artistic programming, athletic opportunities, and financial services in Kibera. The organization firmly believes that through active participation in education, arts, and athletics, young women will have the opportunity to develop a stronger confidence in their minds, bodies, and spirits – empowering them to become inspiring leaders of their own lives, communities, and country. The school itself was founded by a local Kibera resident in 2006 and currently has 130 students, with an ever growing waiting list each year.

This project has two objectives: the primary objective is to develop, recommend, and implement a pilot monitoring and evaluation plan (M&E) to be conducted this summer, and annually by KGSA thereafter; the secondary objective is to begin gathering and organizing qualitative data regarding potential positive youth development indicators for long-term, future analysis of KGSA’s effects on girls and community.

The tasks of the primary objective are to: 1) identify, with project partners and other field experts, the education and youth development indicators for
which to gather data regarding the academic achievements and overall well-being of the students; 2) collect data through a variety of methods including agency records, interviews, focus groups, and surveys; 3) consistently analyze our methodology and results to determine possible changes or adaptation of processes to best fit the local context; and, 4) provide KGSA with a coherent, comprehensive, and manageable monitoring and evaluation (M&E) plan to incorporate into their operational management processes, as well as initiate the first evaluation this summer. The results of the annual evaluations are meant to be used for assessing the effects of KGSA’s current programming, as well as to assist the school’s future fundraising efforts. The secondary objective will consist of detailed and formulated note-taking and journaling, which will be provided to KGSA staff for consideration and evolution.

In summary, there is a critical need for local, regional, and international government entities and NGOs to focus on the quality of young women’s education. Current programs and initiatives do exist, and with the implementation of comprehensive evaluation plans school programs are better able to assess and meet the ongoing needs of their students. Evaluation results provide an opportunity to determine if another’s methodology can be transferred to a new and different context.

Filgueira Galvão, Antonio Carlos; Marcelo Khaled Poppe, Celena R. Soeiro de Moraes Souza
Brazilian Centre for Strategic Studies and Management (CGEE), Brazil, agalvao@cgee.org.br

"International Web-based Consultation on Consumption Patterns for Sustainable Development"

The current debate on the post-2015 development agenda and the sustainable development goals leads to a discussion of crucial points related to the definition of pathways for sustainable development, which must take into consideration how citizens, businesses and governments consume and how such patterns of consumption can be changed. With this in mind, the Brazilian Center for Strategic Studies and Management (CGEE) in cooperation with the Akatu Institute for Conscious Consumption, the Brazilian Business Council for Sustainable Development (CEBDS), the Institute for Sustainable Development and International Relations (IDDRI), the Institute of Research and Development (IRD), the Swedish Agency for Growth Analysis, the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) and the World Centre for Sustainable Development (Rio+ Centre) organized the present international web-based consultation on consumption patterns for sustainable development. The
consultation was addressed to a select group of people from academia, government, civil society and business sectors.

Agenda 21, adopted in 1992 at the United Nations Conference on Environment and Development (Rio 92) stated that “the major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production” and recommended “a multipronged strategy focused on demand, meeting the basic needs of the poor and reducing wastage and the use of finite resources in the production process”. In 2012, world leaders once again met in Rio de Janeiro to attend the United Nations Conference on Sustainable Development (Rio+20). The conference outcome document, ”The Future We Want”, reaffirmed the commitment to fully implement Agenda 21 and called for the construction of Sustainable Development Goals (SDGs) to go beyond the Millennium Development Goals (MDGs) and frame the path to sustainable development.

The survey intends to contribute to the ongoing international negotiations for the definition of the SDGs at the United Nations. This process represents an important stepping-stone towards the creation of a global model for sustainable development. It should engage and establish commitments for both developed and developing countries, as well as balance the social, economic and environmental dimensions of sustainable development, including the challenges presented by a changing climate. Therefore, the objective of the consultation is to map out society’s perceptions on issues pertaining to consumption patterns to enable a comparison of the different views, as well as to identify commonalities, in order to help bridge knowledge and information gaps that may arise in the negotiation of the SDGs in 2015.

Foley, Helen F.
PhD Candidate, Waterford Institute of Technology, Ireland, hfoley@wit.ie

"New Conceptual Framework for Sustainability"

Essentially sustainable development is about the dual goals of the promotion of human development and well-being while protecting the earth’s life support systems (Kates, 2010). According to Orr (2002, p.82) ‘Sustainability is about the terms and conditions of human survival, and yet we still educate at all levels as if no crisis existed’ (Orr, 2002 p.82) Importantly, education for sustainable development is recognised as key to achieving sustainability (Sarabhai, 2013) where without learning, sustainable development will not be realised (Goncalves et al., 2012; UNESCO, 2012). Confusion regarding sustainable development still exists where more recently DuPuis and Ball (2013, p.64) have stated “the concept has escaped definition".
Here sustainable development is defined as:
“The global, simultaneous and interdependent pursuit of equitable socio-cultural, environmental, economic, political and institutional goals relevant to achieving sustainability” (Foley, 2015).

An important contribution of the authors PhD was the development of a conceptual framework for sustainability. The conceptual framework was informed by the critical, interpretive and sustaincentric paradigms, in addition, complex adaptive systems theory and Bourdieu’s Social Human social systems and ecological systems are complex adaptive systems, also informed the development of this conceptual framework.

This conceptual framework for sustainability advances present models of sustainable development. Essentially this framework links the environmental, social economic, institutional and political components of sustainable development, with critical issues and actions needed, in terms of increasing awareness and knowledge of sustainable development. This framework captures the complexity of sustainable development and facilitates systems thinking, regarding the movement towards a sustaincentric paradigm.

The strength of the model is that it can be applied globally and locally, importantly the framework links the achievement of sustainability with awareness and knowledge of sustainable development, consequently this conceptual framework can also be a valuable tool which can aid the advancement of education for sustainable development.

References


Gonzalez, Anabell
MDP Field Practice Coordinator, School of Management, Universidad de los Andes, Colombia, a.gonzalez@uniandes.edu.co

"Accountability issues in nongovernmental organizations applying of quality management"

Nongovernmental organizations in Colombia are under increased pressure to respond to the demands of a variety of stakeholders, due to some cases of alleged corruption and questions about their inner management capabilities and transparency in their processes. As stakes have risen, competition to show better results, sustainability and larger impact has become fiercer. A more demanding society pushes the nonprofit world to use better managerial tools. To achieve proper accountability, organizations have adopted quality management tools from the private world.

Quality, understood as the degree of fulfillment between the organizations’ performance and the stakeholders’ expectations, plays a key role as the organizations faces a more demanding accountability. The analysis and understanding of the relationship between stakeholders and organizations is the main issue around good performance.

To address problems or demands in terms of performance, many NGOs have sought the ISO certification. This attempt to improve their work with the communities by standardization has proven to be not so useful. First, the ISO certification does not ensure compliance of the stakeholders’ expectations. Two, for the organizations there is no real understanding what the relation is between the certification and quality. Three, there is an overall lack of basic knowledge of quality management and it use for NGOs.

On the other hand, stakeholders do agree that standardization is necessary. As these kinds of organizations provide a public service, they should be an example for other organizations both private and public, of what quality means. Nevertheless in Colombia, there are many factors that play against this quality assurance. In the country, there are many territories where there is no or little governmental presence. In this situation, NGOs turn themselves in to the solely service de facto, to the communities. In this case, the expectations or demands of the community turn into immediate demands, as organization respond to basic needs. No matter the process or how it is done,
as long as the organizations comply with this immediate and result
orientated approach.

There is no prior standards that the organization can (in terms of viability) of
want (in terms of desire) to comply, because the expectation of the
community is so basic, that any result would be a good result, as long as the
basic need is fulfilled. Or, from a donor’s point of view (yet another
stakeholder), the performance and the process to achieve results does not
matter, because there is an emotional or a religious connection with the NGO
that impedes the adequate assessment of managerial tools and procedures.
If the stakeholders’ expectations are defining NGOs performance, this
analysis seeks to understand how these expectations influence on the use of
managerial tools of quality in NGOs in Colombia. And the way quality
management tools help the organizations to improve their performance,
results, ensures accountability, and the satisfaction of the “client needs”.

Monroy, Maribel; and Carol Mondragon
MDP Candidate, Universidad de los Andes, Colombia, m.monroy10@uniandes.edu.co

"Empowering Women through Social Capital as a tool in Colombia’s post-
conflict through the program evaluation of the “Escuela de Animación
Comunitaria” in Medellin, Colombia"

Currently, Colombia is at the brink of establishing and negotiating the post
2015 Development Agenda to “successfully face the new development
paradigm: a world with a high demand of natural resources, limited youth
employment, high concentration of wealth, inequality, and a continuous
violence against women” (PNUD, 2015). In Colombia, the Sustainable
Development Goals (SDGs) are focused for peace building, which gives a
specific framework to create new paths towards the fulfillment of the new
goals and best practices in the post conflict.

Within this context, the value of developing program evaluations that
addresses social inclusion, participation, woman empowerment, and skills
development is critical given that these provide more accountably,
transparency, and useful information that will allow us to scale up best
practices. At the same time, actors that are involved need to understand what
programs work well, what actions needed to be addressed in a different way
and also, which ones need to finish.

This paper aims to present an 18-month program impact evaluation that a
group of MDP three students worked on with a local NGO based in Medellin,
Colombia named Fundación Solidaridad por Colombia. Medellin is the second
largest city in Colombia; with near 3 million habitants which 1,300,000 are
women. Medellin is located in the Aburrá Valley in the Andes Mountains
known as the "City of Everlasting Spring" given its temperate climate and vegetation. The city’s population is relatively young, approximately 70% between 5 and 14 years old. 90% of the population lives in 30% of the city’s territory. Medellin is divided into 249 neighborhoods and 16 communes in 6 zones. Approximately 600,000 housing units, 77% form part of the lowest socioeconomic levels, while 19% house those are located in middle and upper income levels (DANE, 2010).

The program led by the Fundación Solidaridad por Colombia is called Animadoras Comunitarias or Women Community Coaches. The program started five years ago with the objective of empowering woman 350 through nutrition, empowerment, and social capital. The program reaches its objective by creating a Coaching School that trains women aged between 18 and 76 years all over the city. 80% of the Women Coaches belong to the low socio economic group and receive training, which then is multiplied by sharing the lessons learned with at least 4 families located in their neighborhood.

Women are the centerpiece of this proposal documenting their transformations from households to local sources of information, to network conveners and thus, change makers in their vulnerable communities.

Based on the program impact evaluation the finding is how community local knowhow represent an important source to empower networks, strengthen local information, and empower communities to become change makers. The paper is organized as follows: The first section provides an introduction and context. Then section two, the methodology used to measure both quantitative tools to capture information such as design thinking and appreciative workshops and qualitative traditional tools like interviews. Section three represents the evaluation results and findings. Finally, concluding remarks, lessons learned, and recommendations.

**Pinto, Thais**
SDSN-Amazônia Executive Coordination, Amazonas Sustainable Foundation, Brazil, thais.megid@sdson-amazonia.org

"Using a web-based platform to promote solutions for sustainable development in the Amazon"

The Sustainable Development Solutions Network (SDSN) is an initiative to foster and support the Sustainable Development Goals (SDGs) implementation globally. In order to do so, there are regional networks to mobilize universities, research centers, civil society and business organizations around practical problem solving for sustainable development.
This paper will present the SDSN-Amazonia, as the regional SDSN network that addresses SDGs within the Amazon basin.

One of its main projects is a web-based platform to share knowledge for Amazon sustainable development. It is an user-friendly platform using a GIS tool database that allows to share information regarding solutions initiatives. It is being built in collaboration with Google and allows different actors to share information on SDGs and in this way promoting experience exchange for development in the Amazon. As its goal is to spread solutions, the network is working for a participatory and co-creation process to identify what criteria define solution for the sustainable development in the Amazon.

The platform is based on a co-creation process led by the network’s members, SDSN and Google. To fulfill the platform, the SDSN-Amazonia is promoting the SDSN-Amazon Prize, an initiative important to endorse the best practices in activities relate to the 17 SDGs. Also, SDSN-Amazonia is organizing online conferences to discuss with specialist and strategic stakeholders groups the best definition for solution in Amazon that fits with the SDGs and Amazon sustainable development. In order to present them at the platform, the initiatives should follow a clear and transparent methodology which considers:

- Replicability potential of the project;
- Relevance of the project to specifics of the Amazon;
- Originality and innovation of the initiative;
- Networking and cross-sector partnerships;
- Use of participatory methodologies
- Project vision of the future

The platform will meet the best knowledge, information and expertise generated by the scientific and academic research institutions, NGOs, private and public sectors at regional level. The solutions will be related to the sustainable development agenda and could be a good opportunity to initiate the discussion around the sustainable development goals indicators for the Amazon Region, once that these initiatives are already in course and could bring motivation to discuss how the SDGs will integrate and realize in the Amazon based on evidences. So, the platform will foster dialogue and inform policy-makers on evidence-based sustainable solutions and so could encourage changes in the Amazon development paradigm.

The sustainable development solutions platform is a major innovation for the global sustainable development agenda as enables the worldwide discussion. It is a breakthrough, once making free-access database access, to greatly influence both private and government discussions and decision-making processes. The challenge is to make the solutions criteria clear and accessible to all the Amazonian realities and compatible to other networks within SDSN.
After the SDG consolidation, this platform will guide and support its implementation by enabling any person to track, analyses, discuss and comment on any SD solution globally.

Ross, Katie; Kumi Abeysuriya, Cynthia Mitchell
Research Principal, Institute For Sustainable Futures, University of Technology Sydney, Australia, katie.ross@uts.edu.au

"Developing principle-based targets and indicators for the SDGs"

The Sustainable Development Goals herald exciting momentum towards achieving global resilience. Critical for the success of this initiative are appropriately scoped targets and indicators, to ensure that the goals are not inadvertently causing problems elsewhere in our complex webs of social, governance and environmental systems. Three valuable resources in ensuring the specific targets and indictors are appropriately scoped are: a reflexive praxis on the MDG experience, the use of systems analytical tools and a focus on the ultimate desired impact of the goal. This paper is a case study demonstrating how the use of these three resources highlighted more appropriate targets and indicators for the SDG goals.

Specifically in sanitation, there is recognition that the MDG focus on improved coverage, while beneficial, has also lead to challenging long-term implications. The fundamental outcome of sanitation is successful separation of people from effluent pathogens; including not just the user but also the broader community. The improved toilet indicator represented a shift in focus from the desired outcome of sanitation to a single stage of the effluent lifecycle. The SDGs now include on-going effluent management, and the goals have the opportunity to further prioritise the key outcome of successful sanitation. A three-year action research project in Indonesia provides a good case study of this opportunity.

In 2015, a research team from the Institute for Sustainable Futures (University of Technology Sydney) investigated the performance data for a sub-set of sanitation systems in Indonesia: community-scale sanitation. Their mixed method approach included interviews and focus group discussions with communities, local NGOs, village leaders, local /national government staff, donors, international researchers; and document reviews.

Indonesia has progressed the MDG7 goal: in 1993 nearly 25% of Indonesia had access to an improved facility. Estimates are now between 55% (UNDP) and 64% (GoI). However, a review of Indonesia’s scale-up of community based sanitation systems provides a rich and nuanced story behind these numbers.
Since 2003, over 13,000 community scale systems have been funded for installation across Indonesia, but the actual coverage is less than reported and the performance of achieving separation is unclear. Most of the installed systems have household connections that are half than what was planned. In addition, there are many factors that prevent the systems from achieving the desired outcome of separation: improperly disconnected septic tanks, unconnected households in the same watershed, malfunctioning technology, etc. Only 2% of the systems funded for installation have had effluent monitoring and even fewer have had pre or post water quality monitoring.

The results of the performance data review highlight the need to have continual focus on the fundamental purpose of sanitation – ongoing separation between people and pathogens. The authors introduce a new concept via a pathogen flow diagram to illustrate both this point and the need of the SDG indicators to be principle-based. The authors discuss how a focus on the principles when designing targets and indicators allows scope for innovative leap-frogging technology that will allow for countries to determine their own development pathway to the desired outcome.

Salviati, Victor; Ben Garside, Leandro Pinheiro, Marisa van Epp
Innovative Solutions Programme Manager, Amazonas Sustainable Foundation, Brazil, victor.salviati@fas-amazonas.org

"Community-driven social programmes and environmental stewardship across the Brazilian Amazon: a cross-initiative M&E framework for understanding the role of social learning in improved impacts"

Bolsa Floresta Programme (BFP) is a payment for environmental services mechanisms created in 2007 by the Government of the State of Amazonas and implemented by Amazonas Sustainable Foundation (FAS) since 2008. It supports the conservation of 10+ million hectares and benefits 40+ thousand riverine populations in Amazonas, Brazil. BFP has four components: one at individual-decision level and three at community-decision level (support to local associations, support to sustainable and local natural resources management, and social investments).

Community-decision level components are discussed in ordinary workshops at the communities. This decision-making process is unique as involves 570+ communities to prioritise their investment plans annually in several projects (e.g., fisheries, forest management, education, transportation etc.).

FAS and the International Institute for Environment and Development (IIED) applied a monitoring and evaluation framework focused on ‘social learning’ to evaluate the learning that happens through the decision-making and the implementation.
Social learning approaches help to facilitate knowledge sharing, joint learning, and co-creation between stakeholders, taking learning and behaviour change beyond the individual to networks. Within BFP community-level projects, social learning clearly is already happening and it is a key aspect of the sustainability of these initiatives. The purpose was to analyse to what extent this group learning was – and understand if proper social learning has a clear link to improved outcomes.

As a pilot, within the Climate Change and Social Learning M&E framework, in January 2015, FAS and IIED interviewed FAS both field and technical staffs and 23 riverine people across the Rio Negro reserve to understand the decision-making process within BFP. The methodology combined semi-structured interviews with focus group discussions in the communities using a participatory visual mapping tool to draw decision-making processes. This facilitated extracting the elements that involved co-learning, reflection, and mapping them back to the indicators across four thematic areas: iterative learning, capacity development, engagement, and challenging institutions.

Initial results indicate social learning approaches can be key in improving impacts and sustainability of aforementioned community-decision based projects. In addition, communities often need further assistance to foster learning and reflection across technical and planning activities. This process provided communities with assistance, both technical and planning, to decide their priorities, their roles within the process and other partners’ duties. The best results were in communities where previous empowerment activities had already taken in place: e.g., done by local associations, grassroots NGOs, church movements etc. People had more awareness of their role and then were able to contribute. In others, people were passive throughout the process and were not able to assess their needs and roles.

This assessment demonstrates BFP needs to consider the “level of engagement and empowerment” of each community to apply the decision-making process. One possible approach to foster social learning is to develop a “matrix of empowerment” tool for supporting the assessment of the community. Scoring “the empowerment level” of each community, FAS and other organisations will be able to better provide support to the decision making process.
Yamoah, Evans; Yodit Tesfaye, Trupti Sarode
Graduate Student, Hubert Humphrey School of Public Affairs, University of Minnesota, United States, tesfa026@umn.edu

"Assessing the impact of short-term volunteers in an early childhood development intervention (ECD) program"

Over the summer of 2015, three Master of Development Practice (MDP) graduate students from the Humphrey School of Public Affairs at the University of Minnesota, will conduct a field based monitoring and evaluation project which will assess the impact of short-term volunteers in an early childhood development intervention project being implemented in the island country of Saint Lucia. The evaluation will be conducted in partnership with Global Volunteers, a non-profit organization based in Minnesota. With the request of local organizations, Global Volunteers undertook the implementation of an early childhood intervention program called Reaching Children’s Potential in the Anse La Raye region of Saint Lucia. Originally a government-run initiative, RCP commenced its operations through the organization in April 2014.

Permanently established in St.Lucia, the RCP program utilizes the services of short-term volunteers for three levels of intervention implemented by Global Volunteers:

- **Nutrition**: Focused on providing EarthBoxes to pregnant women and mothers to sustain easy and affordable access to fresh fruit and vegetables
- **Health**: Involves raising nutrition and health awareness through training, workshops, community outreach and campaigns.
- **Care**: Involves the services of local caregivers who conduct home visits to discuss healthy living habits, monitor pregnancy and children’s milestone growth and provide psychosocial counseling.

Our assessment will examine the impact of short-term volunteers in the ECD intervention as well as if the impact differs in nutrition, health and care aspects. This evaluation is unique in that it aims to contribute to the field of volunteer-based development - a relatively unexplored area of research. The methodology chosen for this evaluation is the Mixed Method approach. The qualitative aspect of the evaluation will be conducted using the Most Significant Change technique, which involves the generation and selection of the most significant impact the program has made as identified by program beneficiaries. The evaluation results will inform future design and implementation of the Reaching Children’s Potential (RCP) program. It will also assist Global Volunteers in expanding the number of target beneficiaries as well as the range of services offered. The results may also rekindle the interest of the government and the funders in the RCP program and help in
garnering support for its implementation in other regions of the island country.

In summary, the monitoring and qualitative evaluation will assist Global Volunteers in making programmatic decisions while also expanding the number of beneficiaries, if the evaluation results emerge favorable. In either case, the project will contribute to advancing knowledge in the specific area of volunteer based development as well as the field of early childhood development in general.
Agriculture Food Security, & Nutrition

Alfano, Melinda; Sarabeth Brockley, Magdalena A. K. Muir, Sami Areikat
MSc, Integrated Water Resources Management, Department of Bioresource Engineering, McGill University, Canada, alfano@un.org
M.A. Environmental Policy Design, Lehigh University; Consultant, Water, Energy and Capacity Development Branch, United Nations Department of Economic and Social Affairs, USA, brockley@un.org
Research Associate, Arctic Institute of North America; Advisory Board, Climate, Coastal and Marine Union (EUCC), makmuir@ieels.com
Sustainable Development Officer, Water, Energy and Capacity Development Branch, United Nations Department of Economic and Social Affairs, areikat@un.org

"Water Scarcity and Drought Management Plans as Enabling Elements for Achieving the SDGs in West Asia and North Africa"

Water is a crucial sector and a key resource for economic growth, social development and environmental integrity in West Asian and North African (WANA) countries. These countries are vulnerable to drought and water scarcity due to their reliance on groundwater and precipitation, and their proximity to the Mediterranean, which is a climate hot spot. The paper focuses mainstreaming water scarcity and drought management in the WANA region under the Post-2015 Development Agenda, including consideration of regional and national integrative approaches and country-specific analysis for WANA countries such as Egypt, Jordan, Palestine, Morocco, Mauritania and Sudan.

The paper is based upon, furthers and communicates the results of UNDESA project, Strengthening National Capacities to Manage Water Scarcity and Drought in West Asia and North Africa. It draws on the proposed UN Sustainable Development Goals, and their targets and indicators. The UN Sustainable Development Goals (SDGs) and the Post-2015 Development Agenda has the potential to bridge the gap between global policies and national implementation, promote integrated policies and interlink issues of importance for sustainable development. Last, it refers to the regional development and integration on energy, water, infrastructure and climate adaptation and mitigation for the Mediterranean, Magreb and the Nile watershed, including consideration of the United Nations Environmental Programme Regional Climate Change Adaptation Framework for the Mediterranean Marine and Coastal Areas and EU Country Roadmaps for Engagement with Civil Society.

The UN DESA project aims to strengthen national-level capacity in water scarcity and drought management and preparedness at the national level for six pilot countries: Jordan, Palestine, Morocco, Sudan, Egypt and Mauritania.
The project provides practical support focusing on policy, monitoring and reporting structures; to mobilize innovative financing mechanisms; and to promote capacity development within the context of the Post-2015 Sustainable Development Agenda.

With its multidisciplinary and holistic approach, this project will aim to remediate water issues in West Asian and North African pilot countries by tackling both the sectorial and nexus dimensions of water. The project promotes transboundary cooperation, knowledge-sharing and stakeholder engagement as three strong tools for curbing water crises and achieving the SDGs for the WANA region. Among other matters, the paper will demonstrate how the UN DESA capacity-building project may be utilized by WANA countries and support successful water scarcity and drought management.

References:
Areikat S., Muir, M.A.K. et al, Using the UN Sustainable Development Goals to Achieve Integrated Approaches to Water Scarcity, Agriculture and Energy for West Asia and North Africa.
MIO- ECSDE : Mediterranean Information Office for Environment, Culture and Sustainable Development.
UN DESA, Strengthening National Capacities to Manage Water Scarcity and Drought in West Asia and North Africa.
UNEP Regional Climate Change Adaptation Framework for the Mediterranean Marine and Coastal Areas (draft).
SDSN, Indicators and a Monitoring Framework for the Sustainable Development Goals: Launching a data revolution for the SDGs.
SDSN Mediterranean Network, Second SDSN for Mediterranean Conference, March 5 to 6, 2015.

The authors are grateful to Melanie Gracy as editor of this work.

Carmody, Padraig
Associate Professor, Trinity College Dublin, Ireland, carmodyp@tcd.ie

"When rights collide: land grabbing, force and injustice in Uganda"

Much media and academic commentary has focussed on the “global land grab” since the food price spike in 2007/8. Part of the ideological justification for this dispossession is provided by Hernando de Soto’s work, which has favoured private land titling to realise and release the “mystery of capital” (2000). However processes of primary accumulation are not mysterious and have been well described. What is less understood is how land grabbing represents not just a conflict between use and exchange values but also...
potentially between different types of rights – such as property rights and the right to the means of subsistence. The realisation of rights through practice and politics legitimates the use of force against some, to protect and fulfil the rights of others. When a conflict of rights occurs, whose rights and which rights should take priority is less clear. In the case of land grabbing, it seems that the dictum “between equal rights force decides” seems to be particularly applicable. A socially inclusive and just epistemic perspective requires that we extend our gaze to take account of the local political dynamics and impacts on, and voices of, people who have been displaced and how their basic rights have been affected by this change – “putting the last first”. These dynamics are marked by unequal background conditions. This chapter empirically explores land grabbing in the Karamoja region of North Eastern Uganda in order to examine these issues. The analysis suggests that extant property regimes may be preferable to more formalised ones based on liberal conceptions of “rights”, where this language can be usurped to serve the interests of the powerful and privileged rather than challenging social injustice.

Constable, Ayesha
Doctoral Candidate, University of the West Indies, Jamaica,
ayesha_constable@yahoo.com

"The Gendered Dimensions of Climate Change: Women, Indigenous Knowledge & Adaptation"

By examining the human dimension of climate change, researchers seek to understand how different groups of people are influenced by the economic, cultural and geopolitical variations. A gendered analysis of climate change examines the differential impacts on men and women. This paper explores the impact on climate change on the lives of male and female farmers in Sherwood Content, Jamaica. Using a mixed-methods approach to data collection, I examine awareness of climate change, perceptions and adaptation to climate change. More importantly, I am interested in understanding their unique situation influences unique responses.

The findings show that women in Sherwood Content, on average were the main breadwinners for larger families or extended families and as a result had greater responsibilities - are more likely to be faced with the direct and indirect economic impacts. These women are more likely to be poor and therefore are at greater risk of being adversely affected by the economic impacts of climate change. As result, these women have responded with greater urgency than the men and have made greater strides in attempts to diversify their livelihoods through traditional and non-traditional income generating activities.
This research contributes to the existing/burgeoning global research on climate change and gender as well as the discourse on indigenous knowledge and climate change. In the local context, it is important as it looks specifically at women in the rural space and their efforts at using traditional knowledge to enhance their capacity to adapt to the changes.

**Polo, Gabriela**  
MDP Candidate, University of Florida, United States, gpolo@ufl.edu

"Oyster farming in Chira Island, Costa Rica: Ensuring food security and sustainability"

The Gulf of Nicoya, located on the Pacific coast of Costa Rica, is experiencing increasing pressures from a growing population, increasing sediment pollution, and the overexploitation of marine resources. This has led to a significant decline in the productivity of fishermen, posing immediate threats to their livelihoods and food security. To reduce pressure on the fish stock, improve food security, and provide new economic opportunities for the gulf’s inhabitants, especially for women, national universities and state institutions have supported women’s producer associations in the implementation of innovative and cost-effective methods of oyster farming. These efforts not only represent a sustainable alternative to traditional fishing, but also have an enormous potential to alleviate poverty and ensure food security. Oysters not only have a high nutritional value and are major sources of protein, but their production process is also relatively inexpensive, easy to learn, environmentally sustainable, and yields higher profit margins as fewer intermediaries participate in oyster distribution. Yet, the small producer associations pioneering oyster production face several challenges related to production, distribution, and internal operations, which are exacerbated by external factors including an underdeveloped oyster market in Costa Rica and insufficient outside support for capacity building. This paper presents the experiences of a women’s oyster farming association in Chira, a large island in the northern part of the Gulf of Nicoya. It shares both successes and challenges linked to local and national food security issues, several dimensions of oyster production and distribution, and their engagement and collaboration with Costa Rican government and academic institutions.
Climate Change and Access to Energy

Alfarra, Tarek; Ian Chow
MDP Candidate, University of Waterloo, Canada, talfarra@uwaterloo.ca
MDP Candidate, University of Waterloo, Canada, i3chow@uwaterloo.ca

"Achieving Net-Zero Self-Sustainable Households and Communities"

With the rapid increase in the economic feasibility and competitiveness of sustainable technologies such as PV panels, wind turbines, electric cars, battery storage, methods of agriculture, new housing designs and urban planning, there is a great potential for these new advances to contribute towards the sustainable development of countries that have been trapped in the cycle of poverty. These new existing technologies can be implemented in various ways to change not only the Global South, but also the Global North.

In this paper, we explore the ability to create scalable net-zero and self-sustainable off-grid communities using existing technologies applied to energy, transport, water, and food production at the household, community and large urban level.

The paper includes primary research in the form of visits and interviews with Canadian renewable energy production and storage technology manufacturers and associations in Ontario to identify and categorize their latest technological advances and acquire an up-to-date understanding of the industry. It also includes interviews with electric car and household battery manufacturers and a review of secondary research of existing sustainable energy, transport, water, construction, food production and waste management technologies worldwide. The research also includes the construction of a prototype passive off-grid garage where integration of construction design and renewable energy production ideas are examined.

Using the information obtained, we carefully integrate the various technological advances and construct an up-to-date scenario for the creation of net-zero self-sufficient community designs that can be replicated both in the Global North and South countries.

What the findings of the research reveal is that the technology exists today for the world to move away from its current reliance on fossil fuels as the primary source of energy and to rely instead on the rapidly improving and increasingly economically feasible renewable energy technologies such as solar and wind. It also reveals the potential for great transformations in the transportation, food production, water and waste management sectors through the use of zero-emissions electric vehicles, non-artificial fertilizer and water-intensive aquaponics farms, renewable energy-powered
condensation technologies and GHG-capturing energy-generating waste management installations, respectively.

The report reveals that the well-designed application of these new and recent technologies will result in an equitable, local job-creating economical and sustainable solution to underdevelopment and the eventual elimination of the use of fossil fuels. Moreover, the report also addresses through selected case studies the main obstacles - such as occupation, conflict and corruption - standing in the way of disseminating these technologies both in the developed and developing world and what can be done to overcome them. It also examines countries and communities around the world where these technologies can be implemented with relative ease - and with great benefits - such as island nations and remote locations in stable countries.

**Baird, Sarah; Derrick Luwaga, Ben Kerman**
Executive Director, Let There Be Light International, United States, baird@lettherebelightinternational.org

"Facilitating Access to Sustainable Lighting Among the Extreme Poor in Uganda"

Global Energy Poverty affects 1.2 billion people resulting in the premature deaths of 4.3 million people a year, primarily women and children in sub-Saharan Africa and Southeast Asia.(1) Multi-sectoral impacts of Global Energy Poverty and Energy Access are well-established and include compromised healthcare delivery and access rates, educational outcomes, safety and wellness indicators, economic stressors, indoor air quality, and destructive contributions to global climate change. This project demonstrates the potential contributions of collaboration to assess unmet priority needs, access resources, and distribute safe and affordable renewable light sources to affect improvements now and build capacity for future energy poverty alleviation.

Energy poverty is highly correlated with extreme poverty, and energy access is recognized as a core component of sustainable development as outlined in the UN SDG 7. Existing data on rates of electrification and energy poverty typically reflect grid extension and connectivity focusing primarily on centralized and market-driven solutions that presume capacity to purchase service if available. Local NGOs and the aid community can play a key role in community-based Tier 1 lighting efforts ensuring that the most vulnerable are included, when government, industry, and regional bodies develop and implement broader-based infrastructure projects.

This paper describes a rural electrification project in the Gomba District of Uganda undertaken by Let There Be Light International (LTBLI) and Kyosiga
Community Christian Association for Development (KACCAD), targeting those likely to be left out of market-driven solutions. Supported by KACCAD, local stakeholders and volunteers conducted a door-to-door canvas to assess current rates of electrification among widows, AIDS orphans, the handicapped and the homebound elderly. The Gomba Lighting Survey was administered over the course of two weeks. A total of 526 respondents completed the Lighting Needs Assessment Survey. The Baseline Survey Report on the Solar Lighting Needs of Communities in the Gomba District found that 81% of respondents live on less than USh 2,000 day, approximately $.67, and 75% of households have 7-9 members. 93% reported using kerosene or candles for lighting, and 38% reported health problems due to poor indoor air quality.

Findings were used to identify households in greatest immediate need, and 300 individual solar lights were distributed to those households. The tension between the intensity of labor required to conduct the rural assessments and the benefits of contact with program staff and volunteers sparked further program innovations. These include: expanding community meetings to raise awareness of alternative energy; training local outreach volunteers to identify and support recipients; recruitment of local self-identified collectives to organize recipient groups; and streamlining in-home interventions with recipients to prepare families for solar lighting. Impact data will help shape future programming.


Bhattarai, Chiranjibi
Engineer, District Development Committee, Nepal, chiran.memory@gmail.com

"Environmental and health impacts of micro-hydro in a rural area of Nepal: A sustainable Development of a Nepalese village"

Nepal one of the developing country, having lowest per capita income in the world, has only 15% of rural people access to electricity. Rural people satisfy their energy needs by burning biomass, damaging both environment and human health. Connecting to national power grid is quite expensive, which seems to beyond the current government capacity. Rural electrification through Micro hydro has proved to be a very successful form. Community participation MH seems to be greater intervention in energy sector in rural Nepal in order to satisfy energy needs.

The Alternative energy promotion center (AEPC) and District development committee has used a holistic approach to launch an alternative energy
initiative in rural Nepal."Wami-taxar" is one of the Village development Committee in Gulmi district where people will have to wait a several years for access to electricity through national grid. So Micro hydro has become a credible option for alternative source to electrify this area. More than 3000 HH has been electrified through 200 KW power, generated from 3 Micro hydro Plants.

The promotion of Micro hydro in this VDC is not only used for rural electrification but also used for improving the quality of life. Micro hydro (MH) system has energize sustainable development by creating jobs, protecting the environment and change in gendered division of labor and socio-economic status. Both male and female they work together in milling, Schools, Nursing home etc. People as well as students of this area have access to modern communication era and telemedicine. Similarly MH canal is used for Irrigation Purpose.

With the global pressure to reduce GHG emissions, MH in this area is gaining Popularity. The MH of this area have significant potentiality of carbon mitigation, which potentially reduce GHG emission through replacement of Kerosene or and diesel. Finally, MH electricity is much welcomed by local people of this area. Establishing the Co-operative of MH user, it has changed their economic as well as social status.MH plants of this area has helped the people to be Socialized, active participation in decision making and gender equity. So MH power system is an "alternate Solution for the growing energy demand as well as sustainable Development in Rural area."

Carr, Paul
MSc Development Practice Candidate, Trinity College Dublin/ University College Dublin, Ireland, pacarr@tcd.ie

"Climate change awareness and education in Dar es Salaam, Tanzania"

Climate change is arguably the greatest issue facing society today, and peoples’ capacities to ‘adapt’ to climate change have become central to policy responses globally. Improved climate change awareness and education is one factor that is seen as a facilitative tool to improve adaptive capacity in society as a whole. This study aims to identify secondary school students and teachers current awareness of climate change in Dar es Salaam, Tanzania; assess the sources through which that awareness is gained and identify gaps/inaccuracies in that awareness. Finally, the research will identify avenues through which government and civil society can improve their methods of climate change communication to the public in order to fill these gaps.
In order to support the effective dissemination of information on climate change, it is vital practice an approach that effectively links policy, stakeholders and audiences while forging strong connections between the message (what), the medium of dissemination (how) and the audience (who). This study aims to identify some of the gaps in this process, with specific emphasis on youth awareness. By assessing climate change awareness locally, we can evaluate Tanzanian government and other stakeholders strategies which seek to improve awareness nationally. Primarily this is solution based research to address Article 6 of the United Nations Framework Convention on Climate Change, which calls on countries to promote and facilitate education and public awareness of climate change. The study also supports the proposed Sustainable Development Goal which aims to: Take urgent action and tackle climate change and it’s impacts.

Current studies with a focus on awareness of climate change have shown a variety of results. These results indicate considerable confusion about the concepts of ‘the greenhouse effect’ and ‘global warming’ as well as the causes and impacts of climate change. Despite some research in this area, there is a strong need for populations to gain a better understanding of climate change mitigation and adaptation.

Climate change education and the general dissemination of climate change knowledge have traditionally been of low priority globally. However, more recently, climate change adaptation has come to be considered crucial within the broader context of sustainable development. Within this framework, the Tanzanian government has enacted a number of initiatives in order to address the challenges of climate change, many of which include methods through which climate change knowledge can be better communicated to the population. Despite these initiatives, the level of awareness and understanding of climate change issues among national stakeholders is still “very low” at all levels. It has been identified that there is a wealth of information that has been collated, but the means of dissemination and distribution are lacking. This study intends to identify where these gaps exist and to assess opportunities for increasing climate change awareness and education in Tanzania.
Chiderov, Tzviatko; Thérèse d’Auria Ryley
Master in Development Practice Candidate, Sciences Po Paris, France, tzviatko.chiderov@sciencespo.fr
PhD Student, Department of Anthropology, University of Florida, tryley@uf.edu

"Drones in Africa? Targeted climate change mitigation in Senegal's agro-pastoralist communities."

This project explores the application of innovative technological solutions - specifically drone technology - to improved agro-pastoralist livelihood security in Senegal. Technological solutions are used by researchers and government programs to both create and scale up effective solutions to local programs. This project however explores the potential for application of technologies by food producers themselves, in order to facilitate self-management and mitigation of climate issues. Ultimately, we argue for the diffusion and democratization of innovative technologies as viable solutions for climate change mitigation.

Climate change puts particular strain on food production in the Sahel. Already arid and semi-arid climate zones are experiencing the pervasive effects of climate change in terms of higher temperatures, more erratic rains, and extreme weather events. Climate change research has extensively studied the impacts of climate change on food production in the region, looking for potential solutions to aid in providing adequate access to water and feed for the production of cattle and small ruminants. Livestock production is important to the diet of the Senegalese population, as well as an essential asset for thriving regional trade within West Africa. Mobile pastoralists have historically relied on scouting via vehicle and horse to find grazing and water access as they move throughout the region. While historical means of scouting are effective, we argue that incorporating drone technology can increase both efficiency and effectiveness while reducing the strain on resources.

Drones are a military-developed technology, however with their decreasing costs, civilian application is becoming more popular. Drones are now increasingly used for disaster response, conservation, agriculture monitoring, construction, real estate, entertainment and more. An important application of drone technology in addressing the challenges of agro-pastoral communities in Senegal will involve using drones as a complementary tool for better and more effective scouting of grazing lands and water sources.

Drones will provide aerial images of landscape for up to 5 sq km. These high-resolution images will show landscape features such as flora density, seasonal waterholes, and man-made boreholes. Such images will be helpful in decision-making concerning which migration corridors to use, while reducing the need for multiple scouts, vehicles, and horses. Simple civilian
Drones equipped with digital cameras are user-friendly, requiring only basic training to pilot. They provide image-based data, which allows for analysis by nearly anyone, including those who are illiterate or literate in non-Roman scripts. Reducing the need for expert intermediaries allows for a more rapid response to data. Finally, the cost of implementing and using the technology will be minimal compared to costly solutions proposed by NGOs and government organizations, and potential collaborations between agropastoralist communities and educational and research institutions will make this an affordable and financially viable initiative.

SMS notifications for weather information, mobile banking and other innovative uses of technology have already had a transformational effects on livelihoods throughout the continent. The dissemination of drone technology infographics can be integrated into the unique technology network of agropastoralists helping them better mitigate the challenges of climate change.

**Haile, Mebrahtu**  
Assistant Professor, Mekelle University, Ethiopia, mebrahtu.haile@yahoo.com

"Investigation of Waste Coffee Ground as a Potential Raw Material for Biodiesel Production"

In this study, the utilization of waste coffee ground for biodiesel production was investigated. Waste coffee ground sample was collected from TOMOCA PLC, Addis Ababa, Ethiopia. The oven-dried sample was then soxhlet extracted using n-hexane to yield 19.73 %w/w oil. The biodiesel was obtained by a two-step process, i.e. acid catalyzed esterification followed by base catalyzed transesterification using catalysts sulphuric acid and sodium hydroxide respectively. The conversion of waste coffee ground oil into biodiesel, was about 73.4%w/w. Various parameters that are essential for biodiesel quality were evaluated using the American Standard for Testing Material (ASTM D 6751-09) and all comply with the specification except acid value. The fatty acid composition of the biodiesel was analyzed by Gas chromatography and the major fatty acids were found to be linoleic acid (39.8%), palmitic acid (37.6%), oleic (12.7%), and stearic acid (7.6%). In addition, preliminary investigation on the solid waste remaining after oil extraction was conducted for possible use as a feedstock for the production of bioethanol. Hydrolysis of the spent waste coffee ground was carried out using dilute sulphuric acid followed by fermentation using Saccharomyces cerevisiae, and resulted in bioethanol yield of 8.3 %v/v. Furthermore, the solid waste remaining after bioethanol production was evaluated for compost (21.9:1 C/N) and solid fuel (20.8 MJ/Kg) applications. The results of this research work give insights on the production of biofuel from waste ground coffee. In addition, the preliminary analysis on the solid waste after
the extraction of the oil suggests that it can be used as fuel hence alleviating major disposal problems.

Islam, Md Manirul
Communications Manager, Grontmij A/S, Bangladesh, manir.ohom@gmail.com

"Role of NGOs in Climate Change and Disaster Management: Case Studies from Bangladesh"

This paper documented the current practices and processes of community initiatives towards flood management highlighting how community people are motivated and influenced by NGOs activities for climate resilient community development in Bangladesh. The study focused on non-structural measure of flood risk reduction particularly the impacts of the projects regarding the influence among community people for flood resilient community development. It is revealed from the analysis that solution to any problem of community lies within community. However, external support from outside is needed to sensitise them. Significant improvements have been achieved by motivating the community for risk reduction related to climate change and disaster by NGOs, yet many overlooked problems are shouting for immediate solution. Based on the field survey and analysis a number of suggestions have been formulated e.g., institutional strengthening, community participation, risk reduction activities integration in development planning process, gender mainstreaming in risk reduction, indigenous knowledge archiving, ease of warning message and cultural activities integration to motivate community people in risk reduction, etc.

Kane, Rugiyatu; Desiré Zongo
MDP Candidate, University of Florida, United States, rkane2@ufl.edu

"What could future Sahelian cities look like? A proposal for sustainable housing in Senegal and Burkina Faso"

The Sahel region is one of the least urbanized of the world however it is facing an extremely rapid urbanization growth. Historically, movement of populations from urban areas to cities has correlated with economic development but the particular challenges faced by the region - including rapid population growth, food insecurity, political instability, all exacerbated by the effects of climate change – compromise this path. Forecasts by international organizations predict that cities such as Dakar and Ouagadougou will be among the “next 10” cities in Africa, expected to triple the size of their economy and double in population size by 2030. The housing sector is in a key position to address the need for adequate living space for a
growing population, while also providing sustainable solutions for adapting to climate change. Sustainable housing particularly makes use of natural and locally available materials for construction, clean and renewable energy sources, and also capitalizes on the designs of living spaces to minimize energy needed for lighting and temperature control. Using the cases of Senegal and Burkina Faso, this paper looks into sustainable housing solutions adequate for urban areas in the Sahel. Four housing models are proposed, notably the Nubian Vault and Francis Kéré architecture, in combination with a comprehensive multidimensional approach to address social, economic, and ecological issues faced in the urbanizing Sahel.

Mammadov, Aydin
MSc. Candidate, Bogazici University, Turkey, mammadov@boun.edu.tr

"Development of the National Life Cycle Inventory Database of Turkey"

Energy sector has rightfully been the main target of efforts to halt and revert the changes in Earth’s climate resulting from emission of greenhouse gases, carbon dioxide being prominent among them. Fuel combustion for energy generation constituted roughly one-third of total CO2 emissions of Turkey in 2012, with electricity output reaching 230 TWh mark. Thus, it is abundantly clear that industry-wide improvements in energy systems would significantly contribute to country’s efforts towards both energy security and tackling its impacts on climate change.

Access to reliable and up-to-date data and its efficient utilization will be essential in the road to achieving the Sustainable Development Goals (SDGs) in the coming decades. Development on the national life cycle inventory (LCI) database undertaken within the scope of this project is the first of its kind in the country and is aimed towards getting started on achieving both SDGs and national development targets. A centralized, transparent and up-to-date process LCI database created with life cycle thinking approach in mind will facilitate the efforts in that direction.

The project is conducted in two phases; Phase I, described in this study, includes the establishment of administrative, managerial and technical infrastructure and framework and Phase II includes the initiation and running of the database. Within this scope, a governing structure that includes the Ministry of Science, Industry and Technology, Ministry of Development, Turkish Statistical Institute, Scientific and Technological Research Council of Turkey, Bogazici University and selected industry chambers and academic institutions was developed and stakeholder relationships and tasks have been assigned to ensure effective decision-making and data flow.
On the technical side, the main frame of the electricity grid mix process that will serve as a core of the national database was developed using adaptive approach where feedstock type and import related data, power plant efficiency and production technologies, transmission and distribution losses and other country-specific parameters were taken into account. It is important to note that while energy processes will form the core of the LCI database, the database itself will not restricted to energy sector and is anticipated to grow to include more sectors and industries in the future.

In the study, we argue that periodic measurement and storage of energy process data and parameters in a centralized, transparent LCI database accessible to all stakeholders involved will greatly facilitate Turkey’s contribution towards SDG of combating climate change. Availability of valid sectoral data will equip policy makers with adequate knowledge to integrate climate change measures into national policies, develop decarbonization strategy and set GHG emission reduction targets in line with UN Goals and expressed in terms of respective Indicators.

Mardones, Cristian
Assistant Professor, Universidad de Concepción, Chile, crismardones@udec.cl

"Effectiveness of a CO₂ Tax on Industrial Emissions"

This study quantifies the amount of taxes collected and reduction of emissions that implementing a CO₂ tax on industrial sources in Chile would generate. An optimization problem is used to simulate the situation that each source faces of choosing the technology and fuel in order to reduce the cost of the new tax. For this, we consider the investments in boilers or dual burners that allow for a change in fuel. The results indicate that taxes up to $10/ton do not greatly modify the use of fuels in industrial sources. If taxes between US $10/ton and $30/ton are implemented, then emissions are reduced rapidly. With taxes higher than US $30/ton, emission reductions stagnate. It can be concluded that taxes that are too low or too high are effective in raising revenue but not in reducing emissions.

Olayide, Olawale Emmanuel
Research Fellow, KNUST, Ghana & Unibadan, Nigeria, Ghana, waleolayide@yahoo.com

"Review of Vulnerability and Policy Responses to Water Supply and Extreme Rainfall Events in Nigeria"

Climate change impacts are predicted to result in extreme rainfall events (flooding and droughts). Nigeria’s high vulnerability to climate change events
(including, rainfall variability) are due to a number of factors: its geographical characteristics, limited capacity to adapt, dependence on climate-sensitive resources, teeming population, concentration of GDP generating industry in locations that are highly vulnerable to climate change, and high levels of poverty. Climate change-induced rainfall variability and impacts are worse for the vulnerable such as the poor, and for those that depend on the natural resource base, like agriculture for their livelihoods.

This paper provides a review of the extreme rainfall events in Nigeria, highlighting the vulnerability and policy responses in Nigeria. The review is to the extent of providing evidence for policy feedbacks as well as priority setting for the post-2015 development agenda for the largest economy and most populous nation in Africa.

The data employed for the review involved hydrological, hydro-geological and meteorological data. Empirical analyses and narratives were provided on water resources (including, trends in rainfall, hydrological areas) and policy responses in form of development of River Basins. Findings also include the vulnerability assessment of water supply to climate change.

**Olugboye, Dayo**
PhD Candidate, University of Wolverhampton, United Kingdom, dgboye@yahoo.com

"Exploring the potential of community based water resource management towards sustainable WASH service delivery and climate change adaptation"

Community Based Water Resource Management (CBWRM) is a set of activities and relationships designed to improve local management of water resources, and so enhance resilience to threats such as increasing demand, environmental degradation and climate variability. It is about involving water users in the management of local water resources. It is a strategy that enables local water users to be involved in and responsible for the management of their water resources. Improved household access to WASH is considered to be critical to local communities’ health and wellbeing but also present challenges to communities’ susceptibility to climatic variability. In the past WASH services have been implemented without adequate attention given to managing local water sources, population growth and climate change variability. Recent studies suggest that the CBWRM approach present an opportunity to influence behavioral change towards sustainable WASH service delivery as well as build local capacity on climate change mitigation. However, little evidence exists to support this hypothesis. This study aim to explore the potential CBWRM approach on the disposition of local communities towards ensuring sustainable WASH facilities continue to deliver as beneficial outcome over time and how important it is to manage water locally in order to mitigate impact of climate change. The study was
carried out using desk review of existing literature, field visits, case studies, and qualitative comparative analysis. Purposeful sampling was used to collect data from 18 communities in Bauchi and Plateau State Nigeria. The study reveals considerable difference exist in knowledge, attitude and practice in the management of local water sources and value for fresh water, water related conflict resolution, recognising the role of women and collective decision making as well as high sense of prioritisation of water use when compared to communities with regular WASH approaches. This paper puts forward a model for step-by-step guideline on CBWRM implementation. We recommend that CBWRM should be adopted as an integral component of WASH service delivery and climate adaptation strategy in Nigeria as national policy. Further research is needed on how to scale up CBWRM context-specific learning on a wider scale.

Orecchia, Carlo; Francesco Bosello, Giacomo Marangoni, David A. Raitzer, Massimo Tavoni
Researcher, Euro-Mediterranean Center on Climate Change (CMCC) and Fondazione Eni Enrico Mattei (FEEM), Italy, carlo.orecchia@feem.it

"The cost of climate stabilization in Southeast Asia, a joint assessment with dynamic optimization and CGE models."

The present study aims to assess the implications for energy consumption, energy intensity and carbon intensity in the Southeast Asia region of a set of short-term and long-term de-carbonization policies characterized by different degrees of ambition and international cooperation.

Southeast Asia is at a time one of the most vulnerable region to the impacts of a changing climate, with millions of its inhabitants still trapped in extreme poverty without access to energy and employed in climate-sensitive sectors, and, potentially, one of the world’s biggest contributors to global warming in the future. Indeed, in recent decades, the region’s growth in emissions has been more rapid than in any other area of the world, also fostered by an extensive use of fossil fuel subsidies and economic incentives for deforestation.

Fortunately, major Southeast Asian countries are also implementing policies to improve their energy and carbon efficiency and are discussing if and how to extend these further. This study firstly offers an insight on the costs, not only in terms of GDP, but also in energy consumption possibility, that five developing Southeast Asian economies (Indonesia, Malaysia, Vietnam, the Philippines and Thailand) could experience in 2020 following the implementation of their national de-carbonization targets. Then focuses more on the long term investigating three scenarios: a fragmented regime where countries continue with uncoordinated nationally-determined commitments (i.e. Copenhagen pledges and INDC), a coordinated, but mid-
ambition global decarbonization goal aiming at stabilizing GHG concentration at 650 ppm, and one more ambitious aiming to a 500 ppm stabilization.

The analysis applies two energy-climate-economic models. The first, the fully dynamic Integrated Assessment model WITCH, is more aggregated in the sectoral and country representation, but provides a detailed technological description of the energy sector. The second, the ICES Computable General Equilibrium model, offers a richer sectoral breakdown of the economy and of international trade patterns, but is less refined in the representation of technology. The joint application of these two complementary models allows capturing of key aspects of low-carbon development paths in Southeast Asia.

Particular care has been devoted to in both models to describe land-use emissions from deforestation and peat oxidation as well as abatement opportunities from averted deforestation through reducing emissions from forest degradation and deforestation (REDD).

The study finds that the fragmented scenario will have similar medium-term economic cost for Southeast Asia to a global climate agreement that stabilize GHG concentration at 600 ppm. However, the emissions reduction achieved is more than 50% lower. Up front investments in low carbon technologies prove to be crucial to keep decarbonization costs manageable and to avoid drastic reduction in energy consumption, especially in the 500 ppm stabilization and after 2035. On the contrary, arrangements to avoid deforestation and the possibility to use avoided deforestation credits in the carbon market prove to be critical to reduce decarbonization costs especially in Indonesia in the mid-term. The study also shows that, transitions toward low-carbon economic systems can lead to a balanced growth path that is more resource efficient, less carbon-intensive, energy and food secured.

Sampaio, Gabriela Passos; Michelle Gonçalves Costa, Eduardo Costa Taveira, Virgílio Mauricio Viana
Technical Projects Coordinator, Amazonas Sustainable Foundation, Brazil, michellegcosta@gmail.com

"Photovoltaic energy access on riverine isolated communities in the Amazonas State"

The seek of sustainable alternatives on energy generation to isolated Amazonian communities is demanding in regards of the universalisation of this public good and its challenges (e.g., political will, logistics, budget and legal issues). In Brazil a major issue is the number of households with informal and non-safety access to energy.
Within the Amazon, mainly in isolated areas, it was quite difficult to be connected to the energy network. The major source is fossil fuel-based electric engines. Therefore it is mandatory to design, implement and assess alternative sources.

In Amazonas, Brazil, over than 91% of the 571 communities benefited by Amazonas Sustainable Foundation (FAS) have only 4-hour energy per day provided by fossil-fueled engines – 60 days per year. Those communities consume 1.8+ million liters per year and spent BRL 5.7+ million. On the top of this, there is an emission of 4.9 thousand tons of CO2e per year.

This scenario fostered the partnership between FAS, Schneider Electric and the Amazonas State Secretary of Environment to develop a sustainable solutions on energy called VillaSmart. This pilot project was implemented in two communities at Rio Negro Sustainable Development Reserve.

The project was based on implementing a hybrid energy option to these communities by offering photovoltaic and diesel equipment and the capacity building of 23 community-based electricians.

The major asset of this project is the proper involvement of the communities in all stages: decision-making, capacity building, installation and the elaboration of the internal rules. In both communities there were 13 workshops to define such rules.

The elaboration of these rules has improved both the involvement and organisation of these communities as they discussed issues such as energy tax, average consumption for each household, duties and responsibilities. Within the project, the monitoring of the consumption pattern and the community-based management indicate the difference between the two communities: Tumbira (bigger and older) rose its consumption in 40% -- using 870+ liters of diesel within 5.8 hours of energy per day. The VillaSmart system offered 76% of the energy demand. At Santa Helena community, they were able to manage its energy demand properly: the energy consumption was kept stable as they follow community-based rules – the system offered almost 100%.

Both communities were linked to a federal lightning programme called Luz Para Todos in 2013. This aspect had a direct impact on the project as Tumbira community decided to renounce it – due to energy availability. Finally the project rose the importance to discuss sustainable energy generation alternatives to isolated communities in the Amazon and as those communities have to be involved properly in participatory approaches.
"Comparative Analysis of Environmental Impact Assessment Procedural Reform Efforts in Japan and the EU: Reducing Barriers to Large-scale Renewable Energy Project Investment Development"

Environmental Impact Assessment (EIA) procedures have been identified as a major barrier to renewable energy (RE) development with regards to large-scale projects, which are a key element if Japan wants to reach its RE share from currently 3% to the ambitious target of 20% of Total Primary Energy Supply (TPES) by 2030; after the 2011 Fukushima Daiichi nuclear power disaster led to the complete temporary shutdown of all of the country’s nuclear reactors.

In EIA law has also been neglected by many law- and policymakers, who have been underestimating its impact on RE development and the stifling potential it possesses. As a consequence, apart from acknowledging the shortcomings of the system currently in place, the government has momentarily no concrete plans to reform the Japanese EIA law again in the near future.

I will use comparative analysis to identify the strengths and weaknesses of the Japanese EIA law by contrasting it with the recently revised EIA legal framework of the European Union (EU) and case studies from a cluster composed of EU member states with low RE shares. This enables me to determine the sections that impact RE development the most and how Japan, through structured EIA law reform, could strengthen its domestic RE project investment environment.

The cluster of EU member states was selected on the basis of factors such as industrial base, GDP per capita, geographic proximity and wide topographical variety. Diverse energy mix, RE potential (for wind, solar and geothermal) as well as a low RE share coupled with ambitious RE targets were the other decisive factors in composing the cluster. The member state cluster comprises the Benelux states, Germany, France and the United Kingdom (UK).

The EU has several laws on EIA and RE such as EU Directive 2009/28/EC on the promotion of RE sources, or the EU Directive 2014/52/EU on EIA, of which an amended version entered into force on May 15, 2014 that mandates that “member states now have a mandate to simplify their different environmental assessment procedures” and imposes a number of rules such as shortened process timeframes, simplified screening procedures and EIAs that are more easily understandable for the public.
I will assess the individual implementation efforts of these rules in the aforementioned member states and their impact on RE development. This alteration of the EIA law is a crucial element to achieve the goals of the recent EU 2030 Climate Energy Policy Agreement that was adopted by the EU in October 2014, which proposed a RE share increase to at least 27% by 2030. As each member state of the cluster that I will analyze has a RE share below the EU28 average, this is an equally ambitious target that propelled the EU to update its EIA framework.

Therefore I will look at a number of case studies, both national and trans-boundary, to determine the impact of these EIA framework alterations and how they influenced overall RE growth, to identify those elements that could be incorporated into the Japanese EIA framework.

Serra, Renata; Sarah McKune
Lecturer, Center for African Studies, University of Florida, United States, rserra@ufl.edu

"Innovative approaches to climate change: A framework applied to Senegal"

This paper presents an analytical framework for examining the development challenges in the African Sahel in the context of climate change. It identifies the most promising conceptual threads within existing research and applies them to analyze the multiple and cross-cutting drivers of change. The proposed framework is the culmination of one-year collaborative project titled “Development, Security and Climate Change in the Sahel”, coordinated by University of Florida, in partnership with two other MDP programs, at Sciences Po (Paris) and UCAD (Université Cheikh Anta Diop, Dakar).

The African Sahel is an expansive region characterized by intense environmental change, rapid population growth, and economic and political instability. Despite this complex confluence of issues, development initiatives have often lacked a systems approach, able to tackle interaction and feedback between sectors, scales, and states. The aim of the paper is to shed light on the interplay between the challenges facing the region, so to pinpoint more effective development-based interventions and solutions.

The proposed framework seeks to explore how dynamic pathways to innovative sustainable adaptations are facilitated or impeded by diverse factors. Specifically, it looks at how both technological and institutional responses can emerge as innovative opportunities in the face of distinct climate change impacts. By focusing on evidence from Senegal, our cases illustrate the urgency to frame solutions that both recognize the interconnection between environmental, health, and socio-economic spheres, and exploit their synergies.
Some of the key innovative concepts used to develop and justify the framework include:

- Dealing with the institutional and technological bottlenecks that limit both the provision of climate information services and the ability of individuals and communities to act upon that information;
- Solutions at community levels that overcome collective action problems and thus enable them to tap into individual efforts in ways that enhance collective welfare;
- Forms of collaboration between government, civil society and private sector that are better positioned to succeed, because they recognize the interests at play and find ways to appease or neutralize constituencies opposed to change.

Climate change is affecting every sector of development, and effective future adaptations will need to be innovative and responsive – not only to environmental changes, but also to demographic, social, and political changes that are occurring in concert with these. Our examples and justification of the framework stem from work in Senegal, which is an appropriate choice for several reasons. The country has laid out a medium-term plan with the goal to become an emerging economy by 2050 (Plan Senegal Emergent). Senegal has pioneered a number of initiatives in the context of climate change and sustainable development, including leading work on the equitable distribution of climate information services among poor and disenfranchised farmers and the significant role of gender in effective climate science. The utility of framework is not distinct to Senegal, however. Rather, it emphasizes the need for a systems approach to development solutions anywhere, and, using the Senegal case, highlights innovative technologies and institutional responses that emerge when the framework is effectively applied.

**Smith, Genevieve**

Master of Development Practice Candidate, UC Berkeley, United States, genevieve.smith@berkeley.edu

"The central role of women in achieving energy-related Sustainable Development Goals (SDGs)"

There are 3 billion people – or 40% of the world population – who still rely on biomass for cooking, lighting and heating. This has immense issues for our planet and for all of us living on it. Exposure to household air pollution (HAP) from traditional cooking practices alone is estimated to kill over 4 million people every year, while millions more suffer from cancer, pneumonia, heart and lung disease, blindness, and burns. In regions such as sub-Saharan Africa, where the lack of access to clean energy solutions and electrification is
particularly significant, nearly a third of the urban population and the majority of the rural poor are using biomass for cooking and heating in traditional open fires. As household managers of energy, women in developing countries are significantly more impacted by this reliance on biomass for cooking and lighting.

Over the past three decades, the global community has responded to this threat through the development of thousands of clean cooking technologies and fuels, innovative distribution and commercialization methods, and the investment of millions of dollars in clean cooking initiatives. Yet, the problem has hardly budged. This is largely due to the fact that cooking is one of the oldest, if not the oldest, cultural practice in our world. Developing a technology in a lab and simply offering or selling it in a community without knowledge of that communities needs and cultural habits, will lead to wasted, unused technologies – and historically has time and time again. It is women as the cooks who ultimately choose whether or not to use the product.

In order to enhance access to clean energy solutions and achieve related sustainable development goals, particularly in the realm of cooking, women are critical partners. They have a role in clean cooking value chains – from design, production, distribution and sales, to after-sales service. Women have unique societal and cultural understandings and can reach new consumer segments, while also being able to better communicate to other women the benefits of cleaner cooking and the importance. Ultimately, women can be partners and agents of change to impact scale of distribution and household behavior change at grassroots levels. Furthermore, engaging women in clean energy value chains is an integrated development solution, which can enhance adoption of clean energy technologies and have catalytic impacts on pro-poor growth through women’s economic empowerment.

Gender is often not a high priority in the energy sector as evidenced by the lack of sex disaggregated data from programs and barriers to the development of gender-aware energy policies and gender-sensitive practices. While this is beginning to change due to energy sector players seeing the benefits of integrating gender-sensitive solutions, additional strategic efforts are required to effectively engage women in the energy sector. Only through building meaningful partnerships and empowering local women and men, can we hope to see the sustainable development goals in access to energy that we seek.
"Investigation of the Carbon Footprint of Bogazici University"

A global trend among universities shows that they are revising their mission and restructuring their courses, research programmes and operations on campus to include sustainability in their perspectives. The long list of signatories of various declarations, which promote sustainability in higher education, is another proof of this change. The Kyoto Declaration of the International association of Universities, The COPERNICUS Charter of the European Association of Universities and Luneburg Declaration are declarations that imply the reduction of carbon emissions a key priority for all organizations including higher education establishments.

The study investigates carbon footprint (CF) of the Boğaziçi University to contribute to the University's vision of being a ‘sustainable university’. A complete carbon emission inventory is taken all contributions of campus buildings and human activities into account including procurement of goods and services. Such a consideration necessitates to include direct and indirect emissions for calculation and use a comprehensive methodology in the scope of this project.

Aim of the study is to calculate direct/indirect carbon emissions by energy use in the campus buildings, transportation of the staff and students, activities occuring from sources not owned or controlled by the university including procurement within the scope 1 2 and 3. It also aims to set out the carbon management plan of Boğaziçi University, 2012- 2020.

In this study, carbon emissions are calculated and reduction targets are set for each campus buildings of the University together with its transportation services. Then, the study provides a carbon management plan to identify and achieve carbon reduction targets.

"Increasing climate information services for smallholder farmers: The case of Senegal"

Across the globe, farmers make strategic decisions everyday about what crops to plant, when to harvest, whether or not to use agricultural inputs (fertilizers, labor, seed, etc.), and more. In the face of increasing climate variability, farmers’ decisions are altered by extreme climactic events like
drought, flood, and rainfall variation. In Senegal, farmers, policymakers, and meteorological agents are aware of the need for better climate information and its role on agricultural practices. Recent initiatives through the Research Program on Climate Change, Agriculture, and Food Security (CCAFS) as well as the Senegalese Meteorological Agency have focused on providing down-scaled climate forecasts to smallholder farmers across the country. In this presentation, we look closely at the Senegalese case and how climate information has impacted farmer decision-making. We propose that increasing the accessibility of climate information will encourage farmers in the region to make more climate smart agricultural decisions.

Zachow, Rosani
Student, UNICRUZ - Universidade de Cruz Alta, Brazil, inasor_1@hotmail.com

"Small Hydroelectric Power Stations as Promoters of Sustainable Development: The Case Of Panambi/Rs-Brazil"

To think on the current environmental crisis we need to make a reflection about the trajectory of society and how settled the relationship man/nature. Modern society and technological progress brought by it does not uphold its promise that the more society if appropriated of nature, the more able it would be to control it and use it to establish your happiness. Such premise is belied by the reality of serious accidents and environmental disasters in proportions never before experienced. The pursuit of happiness or of "sumo" well established by Aristotle in his ethics as the founding principle of Justice always confronted with selfishness and greed are present in all societies. The development model, present in Western society since the beginning of modernity, endangers the lives of all of us as it threatens life itself on the planet Earth. We need to rethink this model because the ecologically balanced environment is a fundamental right of the human person, a right for all, transcends the individual, beyond the limits of individual rights and responsibilities. We need to rescue the principle virtue of sumo well proposed by Aristotle where justice and ethics are interwoven so that mankind achieves happiness. Our study draws attention to the need for sustainable development that respects cultural diversities, which can be obtained with the use of environmentally sustainable technologies that can be applied in promoting development with differentiated features and involving the rational use of existing water resources. It was decided, in this work, the case study as methodology, because this methodology allows a phenomenon is analyzed within its context. The main objective is to discuss the model of small hydroelectric stations of low environmental impact as a model for isolated communities. The installation of small hydroelectric stations with the specific goal of meeting communities in remote locations, using the riverbed as a reservoir, generating energy at low cost, without waste, in a sustainable manner, with the involvement of the community, so
that they feel as engaged, committed to preserving the environment. Access to electricity is today an essential condition there is development and the improvement of HDI indicators generating quality of life. To enhance human development, quality of life must be influenced positively through a model of sustainable development, harmonizing the relationship man-environment, respecting the uniqueness of communities and their localities. Also, must give priority to the development of processes, methods, natural resources management and environmentally compatible equipment, without prejudice to the efficiency and economically viable. The rescue of the Aristotelian virtue can be the leitmotif of these enterprises and that we can achieve the ultimate goal of our existence the "sumo" right: the happiness of all mankind.
Examining the Science-Policy Interface

Colglazier, William  
Visiting Scientist and Senior Scholar, Centre for Science Diplomacy, American Association for the Advancement of Science, USA, bcolglaz@aaas.org

O'Connor, David  
Chief of the Policy and Analysis Branch, UN DESA/DSD, USA, oconnor3@un.org

Roehrl, Richard Alexander  
Senior Economic Affairs Officer, Science and Technology Co-Leader, Global Sustainable Development Report, UN DESA, roehrl@un.org

Walsh, Patrick Paul  
Chair of International Development Studies, University College Dublin, Ireland, paul.walsh@unsdsn.org

"UN DESA/DSD Global Sustainable Development Report"

The 2015 Global Sustainable Development Report was launched in June 2015 and contributed to the 2015 session of the High Level Political Forum (HLPF) on Sustainable Development.

Following the approach piloted for the preparation of the Prototype and the mandate given at Rio+20, the general approach to the 2015 edition of the GSDR report is that of an assessment of assessments, documenting and describing the landscape of information on specific issues. The report is global in coverage while taking into account the perspectives of the five UN regions. Extensive inputs was sought from the UN system, government officials and stakeholders at all levels, including representatives of academies of sciences, of key international assessments, and relevant UN expert groups.

In this panel we examine a range of issues to be considered, including facilitating contributions from the Scientific community, and developing more systematic approaches to identify science and technology issues for the attention of policymakers in the context of the HLPF.

The GSDR process as a guide for action using science, technology, and innovation to achieve the SDGs:  
Education

Correa, Edvaldo; Nathalia Flores
Education & Health Programme manager, Amazonas Sustainable Foundation, Brazil, edvaldo.correa@fas-amazonas.org

"Technology for Sustainable Production in Conservation Units of the State of Amazonas/Brazil"

Under local demand, in order to bring professionalization and new economic perspectives to the young dwellers from the deep Amazon, the Amazonas Sustainable Foundation (FAS), in partnership with the Centre of Technologic Education of the State of Amazonas (CETAM), designed and implemented a Postsecondary technical education course in Sustainable Production in Conservation Units at the Uacari Sustainable Development Reserve. The program content was thought for being suitable for local reality, with 1,000 hours of workload divided in 5 modules. It had two major goal: (a) to build capacity and foster youngster in natural resources management enterprises, and (b) to strength local community organization.

The course was held in a very inspiring space for innovation, the Conservation and Support to the Sustainable Entrepreneurship Centre “Padre João Derickx,” at the Bauana community, Uacari reserve, Amazonas, Brazil. The application process selected 50 students for starting in November 2013.

Teachers were from CETAM, trained by FAS to fit the approach and the content to the local reality, and they covered 25 themes, organized in 4 modules in one-year course. Students had theory classes inside the classrooms and practical classes in other areas within the Centre (i.e., vegetable garden, agroforestry area, and woodworking). In order to graduate, students had to elaborate – different from current courses – a business plan based on their communities’ needs, abilities, available funds etc. The goal was to provoke students to create something practical and useful, as well as fostering their entrepreneurship. The Centre provided a favorable environment to the leadership, innovation and encouragement for formulation of content schedules, search of new challenges and empowerment.

Some indicators showed the success of this initiative, such as high level of satisfaction (70%) and the low level of waiver (5%) of the students. After concluding the course, the students are graduated as technicians in Sustainable Production, and they are able to work within conservation units across the Amazon. This early graduated class, with 45 students, elaborated a
variety of business plans (e.g., açaí pulp production, vegetable oil production, raise poultry, and fishery).

The course, on the top of offering technical expertise to youngsters, also fostered group learning within a collaborative space, arousing innovative opportunities to their professional lives – inside and outside the reserve.

David, Nathan  
Senior Lecturer, University of Nigeria, Nigeria, nathan.david@unn.edu.ng

"Information Communication Technology in Rural Schools of Nigeria: Case Study Enugu State, Nigeria"

We live in an era of information explosion. Once there was want of information, today we are drowned in the surge of information. Without the basic computer literacy, one finds it almost difficult to function comfortably in society. I believe that countries like Nigeria must lead the way for new IT markets, and indeed attempt to gain such leadership if it is to have a sustainable presence in the Information and Communications Technology (ICT) field. The field research suggests that there is a huge untapped demand for computing in rural environments. However current solutions are not tailored for these markets, so the hardware and software industry will have to innovate and come up with appropriate solutions. Educational programs for the rural areas cannot by themselves reach out to all the communities under consideration. There has to be an existing or proposed infrastructure that would enable these programs to be conveyed. Although the aim is "education anytime anywhere for anyone," distributed learning programs cannot by themselves solve the access problem. For example, how can multiple distributed learning programs each find, enroll and support enough students (who could be anywhere)? How do potential students find, select and work with one or more such providers (who could be anywhere)? How can network and equipment access be assured for students? The dire need to bridge the digital divide and for Nigeria to effectively join the newly emerging global economy driven by information and communication technologies has provided the basis for research into the need to provide an effective communication infrastructure for the rural communities. Enugu State is predominantly a civil service state and has a variety of educational institutions. Enugu is situated in a hilly region and therefore incorporates a number of challenges for ICT services. This work highlights the plight of schools in rural areas where the lack of basic amenities is the order of the day. In order to provide ICT to rural areas the primary focus is rural education with the provision of running an Internet Service in an effort to become self-sustainable. This would in turn ensure the development of a critical mass of rural dwellers, enabling them to benefit from better IT driven education. These users would require remote access to a central site with
connectivity to the internet. The key concern is to provide a solution that will aim at functionality, performance, scalability, availability, and security. The objective is link the access centre in Enugu to the Local Government Areas of the state via VSAT. From the LGA’s a wireless point to point link using the IEEE 802.11 protocol would be deployed to link the rural areas, in this case secondary schools. Experts in education suggest that ICT will cause an even more dramatic prototype for E learning since learning over the Internet is neither time bound nor place bound.

Gunewardena, Dileni  
Professor of Economics, University of Peradeniya, Sri Lanka, dilenigun@yahoo.com

"Girls’ education and labour market empowerment: What do we know and what do we need to know?"

Two key trends are evident in relation to girls’ education and female labour market empowerment. On the one hand, there has been much progress toward achieving gender-parity in primary and secondary education in most regions in the world (Winthrop and McGivney 2014). On the other hand, female labour force participation and female employment as a percentage of population have been stagnant or declining in most regions, though rising (slowly) in Latin America, Middle East and Sub-Saharan Africa and the developed world (ILO 2015). Stagnant female force participation and employment is evident in countries with high female educational attainments such as Sri Lanka, where female enrolments have long surpassed male enrolments in secondary school yet female unemployment has been twice as high as male unemployment (Gunatilaka, 2013, World Bank 2013, Gunewardena et al 2009).

This gives rise to the question: Why has gender parity in education not translated to gender parity in labour force participation and employment? This paper reviews the recent and growing empirical literature in developing countries that examines the determination of female labour force participation and employment, focusing on (1) the relationship between education levels and the probability of labour force participation, including the hypothesized U-shaped curve (Verick 2014) and (2) supply and demand side factors that promote or detract from female labour market participation, such as gender role attitudes, social norms and their transmission mechanisms (Campos-Vasquez and Velez-Grajales 2013), marriage (Klasen and Pieters 2013) childcare and eldercare (Mauro-Fazio et al. 2009), and labour market and economic conditions (Klasen and Pieters 2012). The paper attempts to summarise and synthesise the results of current research while identifying areas where further research could be fruitfully undertaken. It also provides country-level contextualisation through descriptive analysis of data from the Household Income and Expenditure

References
Campos-Vasquez et al, Female labour supply and intergenerational preference formation: evidence for Mexico, Centro de Estudios Economicos, El Colegio de Mexico, A.C. 2013.
Gunatilaka, Ramani. 2013. To work or not to work? Factors holding women back from market work in Sri Lanka. ILO Asia Pacific Working Paper Series, New Delhi: ILO.

Harr Bailey, Marcia
Assistant Professor, University of Wisconsin-Platteville, United States,
marcia.harr.bailey@gmail.com

"META 4 HESD: Mindful Entrepreneurship Training for Action through Higher Education for Sustainable Development"

Education plays an integral role in developing a civil society. Within developing countries, the lack of access to adequate education prevents many individuals from achieving literacy, obtaining employable skills, and ultimately realizing economic independence. One philosophy of the education reform movement is service leaning: community service that is linked to curriculum to address a need in the community. Recent research illustrates the importance of this model as a means of creating socially responsible members of society while solving development needs.
Social entrepreneurship refers to business -nonprofit, for profit, or a hybrid of both- for a social good. Social entrepreneurs are change agents that provide innovative ideas to address the world’s most pressing social issues. They work in many fields, including: education, agriculture, environment, health, and enterprise creation. Successful entrepreneurs understand the local context in which they work and then are able to scale projects, creating social impact and change. Ashoka is an organization that promotes social entrepreneurship and develops and supports the leaders of these movements. Ashoka Fellows have a profound impact; 83% of fellows have changed a system in at least one way at the national level within ten years (Drayton, 2006).

The Lean Startup methodology applies the scientific method to business model development. A problem is identified, assumptions are made about how to address the problem, research is performed, and then these ideas are tested. During this process, feedback from potential customers, partners, suppliers, and resource people is gathered and then considered during product or business development. This process improves agility and new startups are able to adapt quickly to fit the needs of those that will benefit from the idea: future customers.

This study investigates a sustainable development service learning program that develops future social change agents. First, it will explore current Education for Sustainable Development initiatives in Lao People’s Democratic Republic and will introduce a culturally relevant higher education service learning model, EducAsianal Community Engagement, as a unique educational initiative. This model bridges education for sustainable development with experiential education in a Laotian context and is applicable to other contexts. Second, it will introduce a lean startup social entrepreneurship service learning curriculum called Mindful Entrepreneurship Training for Action (META) as the foundational coursework for future students of a mobile college that will employ EducAsianal Community Engagement for students from Southeast Asia, Western Countries, and beyond.

References
Isife, Theresa
Research Fellow, Institute for Development Studies, University of Nigeria, Nigeria,
chimatheresa@yahoo.com

"Environmental Education of Women in Agriculture in southeast Nigeria and Its Implications for Sustainable Development"

This paper dealt with environmental education of women in agriculture in south east Nigeria and its implications for national sustainable development using primary data. The study used survey research design and questionnaire was the instrument used for the study. The sample size of 254 was randomly selected from the four communities in the two Local Government Areas of the states from the total population of 2,130 women farmers. The findings revealed the presence of the environmental problems such as erosion, unprotected water sources, the indigenous practices used by their elders has been abandoned such as use of dug wells in their compound to collect water during raining season, cutting down trees from the forest reserve for sales, they have not been involved in mixed cropping and crop rotation, bush burning and cutting down of trees in the old forests for farm land, they have not been involved in any lecture about the environment and they will like to participate in any of the seminars on environmental issues. The paper concluded that inclusion of women farmers in the environmental education will encourage the protection and conservation of the environment and that the women farmers sticks to environmentally friendly style for more economically beneficial agriculture and recommended among others that environmental education through seminars and workshops, that introduction of payment to the women groups that do not tamper with the forests will enhance environmental protection, planting of trees by the women farmers will go a long way in protecting the environment that enhances sustainable development.

Knap, Catherine; Vandana Chauhan
Master's Candidate at the University of Ottawa, former Department Intern at the All India Disaster Mitigation Institute, Ahmedabad, India, cknap030@uottawa.ca
Senior Coordinator at the All India Disaster Mitigation Institute, Ahmedabad, India

"Empowering Children for Disaster: The Experience of the All India Disaster Mitigation Institute in Child-Centred Disaster Risk Reduction in India"

In the last decade, child-centered Disaster Risk Reduction (CCDRR) has been gaining traction as a sustainable approach to development. It is an idea, however, that is yet to be prioritized in many developing, disaster-affected regions of the world, of which India is one. The growing work of the Ahmedabad-based non-governmental organization (NGO) the All India Disaster Mitigation Institute (AIDMI) in CCDRR is helping to make this a
reality in communities across India. By giving children the support they need to help themselves and others in disaster situations, communities become empowered through their children.

Over the 30 years that AIDMI has been active, they have observed that the less than robust position of child rights in India is shaken further in disaster situations. This largely comes from errors in knowledge among those who work with children, gaps such as poor awareness of the impacts disasters have on children, their vulnerabilities and needs, inadequate understanding of child rights during disasters, perceptions that children lack autonomy, and the belief that children cannot contribute to disaster risk reduction (DRR) efforts. As a consequence, children are typically those most affected by disasters.

AIDMI’s approach to CCDRR involves partnering with local NGOs and school stakeholders in socio-economically deprived regions that are highly vulnerable to disaster. In their initiative, AIDMI facilities training workshops that aim to increase awareness of DRR and climate change adaptation (CCA) in schools, encouraging critical thinking in both teachers and students.

Within communities AIDMI has intervened, many children the NGO has worked with are the first generation in their families to attend school. These children often become eager conduits for spreading awareness about safety to their family and friends.

AIDMI’s interventions go beyond imparting knowledge of what to do in emergency situations. It is typical in classrooms where interventions have taken place to find the students mobilized to other social causes, motivated towards leadership roles. While these are not ordinary classrooms, it is the hope that they become the norm, a new standard in Indian education nationwide. This brief paper discusses the AIDMI experience in working towards this goal, and the potency of CCDRR in attaining it.

Kulce, Gulsum
PhD Candidate, Environmental Sciences, Turkey, gulsume.kulce@boun.edu.tr

"Sustainable and Green Campus Initiative Student Behavior Survey"

In recent years, there has been an increasing awareness of the need to manage the impact of human activities on the environment. Environmental education and its role in changing the lifestyle and attitudes of students are therefore crucial in altering future consumer behaviour. A Sustainable and Green Campus Questionnaire-based survey was carried out at Boğaziçi University in Istanbul with the participation of 1864 respondents. Our survey
focused on the pro-environmental consumer behaviour and lifestyle patterns of university students.

The main assumptions of the research were that: (1) To determine the demographic characteristics of students; (2) impacts of environmental education are reflected in the consumer behaviour of students; (3) courses on sustainability and environmental issues offered by the university significantly enlarge students’ environmental knowledge base—however, their attitudes are also shaped by several other factors; (4) reported environmental awareness and actual behaviour of respondents are usually not consistent. The information obtained from Sustainable and Green Campus Questionnaire was analyzed by using Statistical Package for the Social Sciences (SPSS, version 21.0) statistics program.

In conclusion, questionnaire results are presented. The aspects of sustainability are interconnected and related to each other and understanding these relationships is crucial for successful implementation of an university students behaviour. It is a true challenge for environmental education to address the student groups with different consumption and lifestyle patterns in order to motivate them towards more sustainable consumer behaviour.

Laufer, Hanna
Research Associate, Planet Finance Southern Africa, South Africa,
hanna.v.laufer@gmail.com

"Behavioural Economics Concepts in Financial Education"

Despite the lack of robust evidence for the effectiveness of financial education interventions, policy makers seem to consider them of considerable importance. Currently 110 countries are members of the International Network on Financial Education (INFE), led by the OECD. Nineteen (19) of those are African countries. Whereas Nigeria, Zambia, Namibia and South Africa already implemented National Financial Education Strategies. Further, strategies are under consideration or development in Kenya, Malawi, Uganda and Tanzania. In total, 47 countries worldwide have either started or already completed the process of implementation (OECD, 2013).

Considerable amounts of public resources have been assigned to reaching the targets defined in national strategies. Deb and Kubzansky (2012) estimate the outstanding resources to educate the yet unbanked - approximately 2.7 billion individuals - and the 500 to 800 million that have gained access to financial products recently, but have never been exposed to financial education to an amount between 21 and 30 billion US$. It is sensible to
assume that even people who have been exposed to financial education might need refresher courses, or further education, as financial lives are dynamic. These costs are not accounted for in the calculations.

Additional to the public sector, financial education has gained momentum among financial institutions. High inactivity rates of accounts amount to maintenance costs with no income. Financially capable customers might be better equipped to select appropriate products and use them more frequently.

The key question remains: Why do policy makers and FSPs allocate substantial amounts of resources to an instrument that is yet to be proven effective?

Regardless of the motives, the financial education puzzle calls for another set of questions:

• Can the effectiveness of financial education interventions be increased without simultaneously increasing its costs?
• Can we address behavioural biases in financial education programs?

The methods of behavioural economics grant a comparatively more realistic concept of decision-making, as they consider psychological and cognitive limitations. Behavioural economics is suggested to explain field anomalies in a more accurate way and thus lead to clearer policy instructions (Camerer, 2002).

The research at hand is concerned with the question whether behavioural economics methods can accurately describe the observed behavioural biases in financial decision-making. If so, behavioural economics concepts and their underlying psychological limitations can be used as a starting point to identify potential levers and tools to support training participants of financial education programs to overcome the psychological bottlenecks and constraints. The paper thus attempts a practical approach to integrating behavioural economics concepts in financial education.

Throughout the field research, twelve financial education practitioners were interviewed. Among them, trainers and consultants from practitioner organisations, such as CGAP, ideas42, GIZ and FinMark Trust. The interviews served to confirm key behavioural biases and assess the fit of behavioural economic concepts to explain them. Based on the intermediate findings two behavioural concepts were identified to have considerable effects on the effectiveness of financial education: Procrastination and Mental Accounting. Practical applications such as self-assessment tools, commitment mechanisms and incentive structures are candidate solutions suggested by the experts.
Sustainable development is a major global objective to overcome the economic, environment and society crises in many countries. One of the main instruments to develop a smart, sustainable and integrated growth (European Strategy 2020) is through quality education able to promote inclusively and equitable learning opportunities (third point of the Sustainable Development Goals; Agenda 21; Rio+20) specifically on sensitive issues such as social responsibility, social entrepreneurship and sustainable innovation, so that all citizens can acquire and develop competencies and professional skills needed to promote their employability, active citizenship, and intercultural dialogue.

In this context, the research aims are: firstly, to explore the transition from the traditional passive model of education to the more proactive and dynamic model, with particular attention to the evolution of the University approach to integrate issues such as CSR and Sustainable Development. The context analysis underlines the main internationals strategies for sustainable development (Rio+20, Sustainable Development Goals, Europe 2020), with a particular focus on the Triple Elix model (Etzkowitz H., 1993; Etzkowitz H. and Leydesdorff L., 1995), defining the relationships between the University, Public Administration and Business (Ranga M. and Etzkowitz H., 2013), and the education programs at university level with CSR and Sustainable Development in Italy and worldwide (Italian Center for Social Responsibility, 2009; Saul R., 2011). Secondly, the research analysis aims to define the concept of “Third Mission”, taking into consideration the European and Italian Universities (Novelli G. and Talamo M. 2014). Thirdly, the research identifies and analyzes the link between education, territory, society and innovation and the shared value through empirical evidence at faculty level. In particular, it analyzes the social impact on the territory, citizens and students in terms of employment and learning of some innovative practices of training (education +Action) promoted in 2015 by the School of Economics at the University of Rome Tor Vergata.

The project results allows to develop a bottom-up model of learning and education dissemination on the sustainable development able to:

1. Sensitize students to be active and shape their future: the raising need of stimulating confrontation on the sustainability issues, including young people, public and private institutions, local businesses and third sector
organizations to identify needs and proposals for sustainable development of the territory;

(2) Create the profile of “local ethical promoters”: young people who can assist the territorial organizations or can decide to constitute new ones, and which can bridge or integrate the different territorial subsystems, such as businesses, social promotion, school, and universities;

(3) Create and strengthen the local territorial networks: integration of systems and the spread of social responsibility;

(4) Connect the networks for local development with those for social inclusion and training: create a stable relationship between the policy development, labor, education, universities and social welfare;

(5) Contribute to the creation of a system of services to responsible territorial development: identifying good practices and creating new ones with the students particularly attentive to the development and social inclusion.

Mohammed Akib, Noor Adelyna; Suzyrman Sibly, Mohd Sayuti Hassan, Kanayathu Chacko Koshy, Kamarulazizi Ibrahim
Senior Lecturer, Centre for Global Sustainability Studies, Malaysia, adelyna@usm.my

"Educating the future generation on sustainability in the formal curriculum towards achieving the Global Action Plan”

There are a number of ideas and different ways in grasping the concept of Sustainable Development. It is an ambiguous concept that cuts across many disciplines. In the 1987 Brundtland report, the concept of sustainability is interpreted as “an attempt to create awareness of the disturbing relations between human society and the natural environment”. Hence, the importance of sustainable development was accepted to be in the ‘agenda’ in ensuring a better future for all earth’s inhabitants. This is because development has always driven by a specific need without considering the future impact on the environment and its surroundings. The consequences, most of the time, proved to be detrimental as we already experienced the indemnity of unsustainable development. For example, changes in the global climate as a result of deforestation. Thus, we have to take immediate action in order to detain or possible to cease the pursuant of unsustainable development.

With this in mind, Centre for Global Sustainability Studies (CGSS), Universiti Sains Malaysia (USM), Penang, Malaysia was established in 2008, with a primary mission to contribute and promote education and research based capacity building for the implementation of sustainable development focusing on the ‘bottom billions’. In this effort we have developed courses and programs, which could be useful in educating our future leaders to be veracious in handling sustainability issues. Our teaching involves first year
sustainability development (SD) course and a Master level Sustainability Development Programme (MSDP).

In our SD course WSU 101 – ‘Sustainability Issues, Challenges and Prospects’ emphasizes the implementation of sustainable development through global case studies. This course also aims to expose students in the current developments linked towards the agenda of sustainability studies. At the same time, nurturing their skills toward developing sustainability-oriented programs. Currently we have close to 500 undergraduate students registered under this programme.

In terms of educating our graduate students on sustainability, MSDP is a global interdisciplinary graduate degree programme that prepares our graduate student to better identify and address the challenges of sustainable development. This is a coursework, interdisciplinary programme equips development practitioner to speak the different 'languages' of experts, for example, health, agronomy and economics, enabling them to better understand the root causes of extreme poverty and to address the challenges of sustainable development. This two years coursework consist of four intersecting disciplines – health, natural, social, and management sciences – combined with cross-sectorial field training. This program is monitored by the Global Association Board of Master Development Programme (MDP) supported by the Earth Institute, Columbia University, New York, USA. At the moment there are 25 universities in 6 continents, offering this programme globally. USM is currently the only university in South East Asia offering this programme.

In conclusion, the sustainable development programme curriculum offered by CGSS matched the global needs in achieving the goals for a sustainable tomorrow. We focused our development goals by educating our future leaders and also stakeholders to place the agenda of sustainability to cope with the progress of our nation to suit the global changes.

Odunuga, Abiodun
Masters in Development Practice Candidate, Sciences Po, France, abiodun.odunuga@sciencespo.fr

"Trickling down youth unemployment in Nigeria by leveraging on Entrepreneurial Education"

According to the 2012 National Bureau of Statistics (NBS), Nigeria’s population is said to have grown to about 167 million. The population influx includes approximately 50% young people who are between the ages of 15 and 34 years old. This demographic figure has been left out of the economic dividends with the prevailing rate of unemployment among the youths. In
2012, the number of unemployed youths was approximately 11.1 million. University graduates also constituted about 20% of the youth unemployment and often remained unemployed for five years or more post-graduation (NISER, 2013). Various international organizations in the field of development have signaled that this figure could constitute a huge ticking time bomb in Nigeria if nothing is done to reduce the unemployment rate.

There are many contributing factors why the prevalence of unemployment among Nigerian youths is at an all-time high. Reasons such as high population growth rate of 3.5% per annum; poor educational curriculum that does not reflect or meet the challenges of the 21st century graduate; skills mismatch between graduates and potential employers; infrastructural deficits due to weakening effect brought about by the structural adjustment program (SAP) and unsound, inconsistent, distorted public policies relating to youth development and unemployment all contribute to youth unemployment. These listed reasons, although quite tangible for unemployed graduates to overcome, are difficult to reach because graduates lack essential entrepreneurial education. With proper entrepreneurial education, youth could diminish a critical social divide and other societal vices within the country. Young people can indeed become game changers by strengthening the informal sector of the country. Although ignored, the informal sector currently contributes about 57.9% of the country’s total Gross Domestic Product (GDP). In an effort to decrease youth unemployment, this paper seeks to present the new model of education that has been tested at various fronts within Nigeria to curb unemployment, while also promoting job creation vis-à-vis economic empowerment. The paper critically looks at how various stakeholders can work together to absorb the dividends by promoting entrepreneurial education to strengthen the sector. This paper will give examples of local success stories to illustrate how a social business such as Business Management Consortium (BMC) and other institutions within Nigeria have been able to leverage the Entrepreneurial Education tool to bridge this employment divide.

As strategic planning is needed to exact change, and combat the menace of youth unemployment plaguing the nation of Nigeria, the proposal provides insights into models that already exists within the framework of BMC as a social enterprise; the possibilities existing across various sectors and points to action elements on how to make the necessary adjustments to ensure that this youth bulge does not constitute a greater burden to the country in the future. Keen attention is given to concrete implementation strategies that can be locally promoted across different scales but with a long-term national and regional outlook.
"Access to Higher Education in Nigeria"

Education is the basic catalyst that will bring about development of an individual and the society. This is why the Federal Government of Nigeria in the National Policy on Education reiterates “that education is an instrument for excellence through which sustainable national development can be achieved” (FRN 2004:4). National development measures are being put in place by different countries to encourage access to education. Some global initiatives put in place to ensure access to education. They include among others:

- The Jomtien World Conference on Education for All (EFA) held in Thailand 5th-9th March (1990).
- The EFA 2000 declaration, the Dakar Frame Work for Action, and the Millennium Development Goals (MDGs).
- Article 26 of 1948, the universal declaration of Human rights by the United Nations.

The Nigerian Government has demonstrated its acceptance and commitment to these by being a signatory to the initiatives whose implementation has enhanced access to education at the primary and secondary school levels and created awareness to the youths of the values of education, thus their demand for higher education. Higher education in Nigeria is given in universities, colleges of education and polytechnics. There are regulatory/supervisory agencies in-charge of these institutions. Every year, about a million or more students apply to enroll into these institutions, but barely 10% of them actually secure admission (JAMB, 2009). A lot of concern is growing about the teeming population of youths who want to gain higher education, but were unable to get admission into the universities. In 2012, for instance a total number of 1,503,931 candidates wrote the 2012 Unified Tertiary Matriculation Examination (UTME), competing for 500,000 positions in the universities. In 2013, 1.7 million candidates competed for 520,000 spaces in Nigeria’s universities. This was only 30.6% of the youths who gained access to university education. One would ask what happens to the remaining 69.4%. Again, many students were not offered admission in the faculties of their choice. More universities are being opened, yet access is still a big problem at that level of education. This study therefore aims at finding out the challenges and solutions to the access to higher education. What programmes and strategies could be introduced to promote access to higher education in Nigeria? Is there also gender equity in access to higher education in Nigeria? To carry out this study, two instruments will be used: a questionnaire to sift information on the challenges and the solutions; and enrolment data from federal, state and private universities, colleges of
education and polytechnics. The questionnaire will be administered to the Executive Secretaries of the regulatory agencies of universities, colleges of education and polytechnics, while data will be collected from Joint Admission and Matriculation Board in-charge of Unified Tertiary Matriculation Examination. Data collected will be analyzed using percentages and mean scores. The results and the recommendations will be sent to the stakeholders in higher education for implementation. It is hoped that improvement in access to higher education will contribute to attainment of sustainable development goals in Nigeria.

Rankin, Kristen; Annette Brown
Independent Consultant, International Initiative for Impact Evaluation (3ie), United States, kristen.rankin@gmail.com

"The state of evidence on the impact of transferable skills programming on youth in low- and middle-income countries"

Transferable, ‘soft’ skills, also referred to as non-cognitive skills and life skills, provide youth with the tools and confidence to succeed in term of employment, health and personal well-being. This paper examines the supply and demand of transferable skills programming on youth in low- and middle-income countries (L&MICs). The core of the paper is an evidence gap map, which catalogues all the impact evaluations of such interventions and maps them according to intervention categories and outcome categories for which the evaluations provide impact measurements. This evidence gap map is part of a project funded by the MasterCard Foundation and the MacArthur Foundation.

Using the map’s matrix framework, we consider 24 intervention categories and find they fall into seven broader groups: formal education, pedagogy, skills training, extra-curricular activities, work placement, alternative learning pathways and financial support. The 15 outcome categories we address span different stages in the causal chain, falling into three broader groups: learning and behaviour, academics, employment, livelihoods and demography and institutions. We also address cross-cutting themes such as the measurement of long-term outcomes.

We also explore six completed systematic reviews and two systematic review protocols identified in our search that address transferable skills and youth in some way. Of the completed reviews, three analyse programmes targeting HIV prevention and sexual and reproductive health and one analyses programmes targeting employability and labour market outcomes. The two protocols aim to address active labour market policies and programmes targeting gang participation and violence.
Of the 90 completed impact evaluations included in the evidence gap map, the intervention category with the most evidence is skills courses at school. Five categories, including teacher incentives and learner-centred teaching, did not have any evidence at all. Among the outcome categories, the majority of evidence was found at the individual level. We found that only one of the completed studies measured outcomes at the institutional level. More than half of the found studies focused on health topics; many were related to HIV prevention.

By exploring the clusters of existing evidence as well as the gaps, we identify promising clusters for research synthesis as well as priority areas for future impact evaluation investments. We find possibilities of research synthesis specific to transferable skills in several categories including skills courses at school and transferable skills training combined with TVET outside of the classroom. In terms of priority areas for future impact evaluation investments, it is evident from stakeholder consultation events and the map that there is opportunity to produce evidence on programming connected to the formal education system, as well as to learner-centred interventions.

We conclude that there are multiple opportunities for further research, including several clusters of evidence in which deeper analysis could be conducted. While ongoing studies are beginning to focus on transferable skills more directly, ultimately more evidence is needed on this topic in L&MICs.

Re, Cheryl
Student/Teacher, Royal Roads University/Community for Learning (1-12 school), Canada, cherylre6@gmail.com

"Developing Awareness: Exploring the Use of Interiority Work to Increase Propensity for Environmental Stewardship"

How can awareness-raising activities and both personal and group reflection can create an emergent ground for a shift in worldviews towards a propensity for environmental stewardship?

A case study was conducted with youth in an impoverished community near Santo Domingo, Dominican Republic. These youth participated in an activity that used adapted photo-voice—a group analysis method combining photography with reflection and discussion—to answer questions regarding their views and relationship with the environment and the effects of environmental degradation on themselves and their community. Analyses of initial and end of study interviews revealed that these youth became significantly more aware of the environment and how and why it is degraded in their community. Participation in this case study has increased desire
among these youth to engage in further environmental issues in their community, generating solutions to environmental degradation.

The findings of this case study have many implications. Institutions and organizations across the globe could engage communities in environmental awareness-raising and reflection activities, such as participant-driven photography projects, as a preface to teaching people about environment issues and maintenance, making learning more meaningful and improving its long-term effectiveness. Such activities may also act as forerunners to community development projects, which may create environmental stewards who can advocate for the environment in decision-making, leading to long-term sustainability.

Sánchez-Terán, Gonzalo
Deputy Director, Humanitarian Programs, Institute of International Humanitarian Affairs, Fordham University, USA, gsanchezteran@yahoo.es

"Education in Emergencies and the SDGs"

The Open Working Group’s Proposal for the Sustainable Development Goals, also known as the Zero Draft, managed to put forward an ambitious and comprehensive agenda to tackle poverty, climate change and social exclusion; there are, however, some glaring blind spots. Focusing on developmental challenges, political inclusion and preventive action, the response to humanitarian crises was not a priority and was only mentioned in the Introduction to the first document and not in any of the Goals and Targets. As part of the Post-2015 Intergovernmental Negotiations, in May of 2015, 2 of the 169 targets (both related to resilience in Goals 1 and 11) included a specific reference to the people affected by humanitarian emergencies. In a world with ever-growing numbers of forcibly displaced people caused by conflicts and natural disasters, it will be impossible to achieve the 'getting to zero' concept of the SDGs if humanitarian crises are not put at the center of the world's attention.

Most of the people affected by those crises are children. For anyone working on education the Proposal of the Sustainable Development Goal 4 opened an unprecedented window of hope marking a significant improvement from the quantitative approach of the Millennium Development Goals and the limited scope of the UNESCO’s Education For All Objectives. But there is no chance of achieving the targets of Goal 4 (from universal primary and secondary education, to the equal access to vocational and tertiary education, to the improvement in the quality of teachers around the world) if we leave behind the children who have been forced to leave their homes because of violence or weather-related disasters.
More than half of the people displaced by conflict in the world today are children. War has a dramatic and disproportionate impact on the life of children, disrupting the school systems and compromising their future. When children reach refugee camps the availability of schools is limited and the quality of the education insufficient. Even in protracted crises we haven’t been able to ensure universal access to quality education for the children that have been living in camps for years. Half of the 57 million children who are out of school today live in conflict-affected countries. Without a concerted effort to provide them with enough classrooms, material, and qualified teachers, Goal 4 will be unmet in fifteen years time.

It has been estimated that in this decade 175 million children will be affected by natural disasters (STC, 2014). The Nepalese earthquake of 2015 left more than one million children without classrooms. The drought in the Sahel region forced tens of thousands of children to leave their schools in order to find food for their families. The number of natural disasters will increase in the next years and with it the number of children that will experience some level of traumatic disruption to their schooling. If the needs of these millions of children are not addressed specifically addressed we might end up with more children out of school in 2030 than the ones we have in 2015.

The Sustainable Development Goals will have a major impact on donor policies in the next years. Recent declines in funding for education in emergencies have limited the capacity of local and international agencies to respond to the needs of the children. Putting humanitarian crises at the heart of SDGs Goal 4 would create the necessary impulse to convert the drama of displacement into an opportunity for learning.

Today Governments, private institutions and international organizations are rethinking the way education is provided in a rapidly changing world. If we don’t incorporate children affected by conflict and natural disasters the predictable outcome will be more poverty, more despair, widening inequality and the failure of the international community to take care of the most vulnerable amongst us.

**Snilstveit, Birte; Jennifer Stevenson**
Evaluation Specialist, Systematic reviews, International Initiative for Impact Evaluation (3ie), United States, bsnilstveit@3ieimpact.org

"What we know and don't know: Evidence gap map of interventions for improving learning"

Education is not only a direct determinant of an individual’s well-being and life-opportunities, but is also fundamentally important in its potential to bring about social change and economic development. Though progress has
been made towards increasing the number of children receiving an education in Low and Middle-Income Countries (LMICs), in many instances increased enrolment has not translated into improved learning outcomes. According to the recent Education for All Global Monitoring report (UNESCO, 2013), around 250 million children in LMICs still cannot read, write, or solve basic mathematics problems.

To surmount these challenges, a more evidence-based approach to education programming is needed. While there is an increasing body of research that examines education interventions in LMICs, the evidence is scattered across different databases and websites. This lack of overview of the evidence can be a barrier to the use of existing research and prevent efficient use of limited resources for new research. The International Initiative for Impact Evaluation (3ie) has developed a new interactive tool - Evidence Gap Maps (EGMs) – to address these issues.

EGMs draw on a range of methods for evidence mapping and synthesis to identify and map existing high quality evidence on the effects of interventions. They have a broader scope than systematic reviews and provide thematic collections of evidence structured around a framework that schematically represents the types of interventions and outcomes of relevance to a particular sector. By mapping the existing evidence using this framework EGMs provide a visual overview of what we know and don’t know about the effects of different programs. They make existing evidence available, providing links to user-friendly summaries of relevant studies EGMs can facilitate the use of existing evidence for decision-making. They also highlight areas with evidence gaps and can be used to inform a strategic approach to conducting new research.

This presentation will provide a demonstration of EGMs using an EGM of interventions for improving learning among primary and secondary school children in L&MICs as an example. It will highlight policy-relevant findings based on the included systematic reviews key ‘gaps’, where little or no evidence from systematic reviews is available, and where future research should be focused.

**Snilstveit, Birte**  
Evaluation Specialist, Systematic Reviews, International Initiative for Impact Evaluation (3ie), United States, bsnilstveit@3ieimpact.org

"Better learning for a sustainable future: a systematic review to assess the effectiveness of education programmes"

Significant progress has been made in improving access to education in recent decades. However, in many low and middle-income countries, the
promise of schooling has failed to translate into better learning outcomes. Although decision-makers have begun focusing their attention on improving learning for a sustainable future, we still don’t know much about the most effective approaches and solutions for ensuring that high quality education is delivered in schools across the world.

While we now have an increasing number of research studies evaluating education interventions in low and middle income Countries, these are scattered across different journals, databases and websites. It therefore becomes a daunting challenge for coming to a conclusion on what the overall evidence has to say on the effects of particular education programmes. In this context, a systematic review is a powerful, transparent and comprehensive research method that can provide the answer by identifying and synthesising findings from a large number of high quality studies. It is thus an important tool for promoting evidence-based solutions that can support countries in achieving the soon-to-be-agreed-on sustainable development goals.

In this presentation, we will present the findings of a systematic review that assesses the evidence on interventions to improve education outcomes for primary and secondary school children in low and middle-income countries. The review takes a holistic approach and covers a broad range of interventions designed to address barriers to children’s learning at the individual, household, school, teacher and systems levels. We assesses the comparative effects of a range of different interventions including school feeding, cash transfers, computer assisted learning, different pedagogical methods, school based management and private public partnerships. By carrying out comparative analysis, we identify the most effective approaches for improving education outcomes. In addition to synthesising evidence on the impact of programmes the review also address aspects related to process, implementation and to identify how promising interventions can work in practice.

For this review, we conducted a comprehensive and systematic search identifying over 60,000 potentially eligible titles. After detailed screening, we included over 220 experimental and quasi-experimental studies conducted in a broad range of countries across Latin America, Sub-Saharan Africa and Asia. We synthesised the findings on effects using statistical meta-analysis, and use a mixed methods, theory based approach to synthesise qualitative evidence and identify barriers to and facilitators of intervention effectiveness.

By considering the evidence on a range of education interventions, this systematic review will assist decision-makers in assessing the comparative effectiveness of different policy options. The presentation will summarise the findings from the review and highlight the most effective solutions that can contribute to achieving inclusive and equitable quality of education for all.
Telesford, John  
Lecturer and Associate Dean, T. A. Marryshow Community College, Grenada,  
john.telesford@yahoo.com

"Integrating Knowledge and Competencies through Applied Research: An Innovative Way to Educate and Train the Sustainable Development Practitioner in the Formal Education Setting"

Competent, highly skilled and environmentally literate practitioners are required for the ‘Age of Sustainable Development’. In this new ‘age’, the stresses on the global and local socio-ecological system will be once again placed under the microscope. Additionally, renewed effort will be marshaled under a set of sustainable development goals, with a view of addressing these stresses. In this context, highly educated and trained sustainability practitioners, who are excellent problem solvers, will be needed. But to educate and train such practitioners, the approaches to education and training in the formal education setting needs to be addressed. A look at what may be called the traditional approach to education and training, reveals that it focuses on classroom, promotes knowledge for its own sake, presents the teacher as the ‘sage on the stage’ and imposes rote examinations and test taking as standard evaluation activities. Seldom, one may find, that the education and training places emphasis on ‘skills, knowledge and attitude’ (SKA), integrated in such a manner that the learner can do or perform in any endeavor or enterprise. The competency based education and training (CBET) model is a promising alternative approach and is presented in this chapter as a pedagogical avenue of choice for training sustainable development practitioners in the twenty-first century.

This chapter presents a project in the CARICOM region, in which the CBET approach is used to develop and deliver an under-graduate program and curriculum in Environmental Sustainability Practices (ESP). This program also features an applied research component integrated into the program that allows for the assimilation of knowledge and competencies that students acquire during the program. The chapter then describes how Education for Sustainable Development (ESD) promotes the CBET approach to Technical and Vocational Education and Training (TVET) as the most promising way of achieving sustainability through education. The section also interrogates ESD, in the context of the United Nations Decade of ESD (DESD), and the role of ESD in the ‘Age of Sustainable Development’. The second section links sustainability and the CBET approach by focusing on CBET’s important contributions to educating and training the sustainability practitioner: providing students with demand-driven skills, knowledge and attitudes and allowing for the acquisition of specific and trans-boundary competencies. The third section presents the Environmental Sustainability Practices (ESP) program, the rationale behind the program and its development methodology that includes a labor market survey, a job analysis workshop.
and a curriculum development session. The fourth section focuses on the results. This section presents an overview of the program structure, explains the rationale for mixing both social and natural science competencies and the knowledge and skills to become a sustainability entrepreneur (management science). The section also describes the curriculum’s applied research components and how they are used not only as an integration tool but also as a means to help solve community sustainability issues. The chapter concludes by describing how the program, which integrates competencies, knowledge and skills with applied research, is an innovative approach to educating and training the sustainable development practitioner in the ‘Age of Sustainable Development’.

Tunde, Shaba
Research and Program (Director), Bokma Foundation, Abuja, Nigeria,
tee_vee4live@yahoo.com

"Early Childhood Development, Education, and Transition to Work (Nigeria Context)"

Children face many important changes in the first eight years of life. This includes but not limited to different learning centres, social groups, mentorship, physiology, parenthood roles and expectations. Their ability to adapt to such a dynamic and evolving environment directly affects their sense of identity when transiting to work and status within their community over the short and long term. The significance or the relevance of ECDE is not yet well appreciated, except for some selected private schools whose primary aim of involvement in the early childhood education is profit-making. In particular, the key turning points in children’s lives such as ‘graduating’ from kindergarten to primary school up to working age or going through a culturally specific rite of passage provide challenges and opportunities for learning and growth on multiple levels. This paper provides major perspectives in early childhood development, education, and transition to work a Nigeria context and also reveals the predominant areas of focus in both academic and professional studies, as well as important neglected viewpoints and study populations. We first illustrate early child development, education and transition to work in Nigeria. The framework of the study clarifies significance of ECDETW and also captures its relevance to overall growth of the country’s social and economic development. The study further reviews concepts in the developmental theory that preceded child education and transitions to work as well as the logic that determines how child education and transitions to work are structured and reviews current consideration of School-to-Work Opportunities Act. More recent approaches are examined, including systems theories, STWOA and the role of children as future participants in work places. The third part view the various problems of ECDETW are highlighted from both the global and local perspectives. The
concluding part identifying possible and workable policy solutions to the problems, citing the need to harmonise early childhood education and transition to work with local education practices, greater transparency in the creation of policy and developmental driven child programme.

Yimbesalu, Joannes Paulus
Global Youth Ambassador, A World at School, Canada, jyimbesalu@yahoo.com

"Improving Sanitation In Schools: A safe haven for School Children"

The link between education and health cannot be over emphasized. When schools lack access to access to clean and safe pit toilets the ability for school children to remain in school and learn is jeopardized, they often fall sick and miss school days hence their poor academic performance. The fact is that 2.5 billion (1 in 3) people worldwide don't have access to a safe, clean and private toilet and most of them live in sub-Saharan Africa and Asia according to WHO. Over 1800 children a day die from diarrhea disease due to lack of safe water, sanitation and basic hygiene. Many deaths related from severe diarrhea today kills a child in every 20 seconds making it the second most deathly disease in developing countries claiming lives more that HIV/AIDS, malaria and measles combined.

In 2010, I founded HOPE for Children Cameroon, with one goal of educating every child, one school, one village at a time. This was as a result of my experiences after visiting some communities in my village in 2008 to carry out a study on the prevalence of malaria among children of school going age. I came across malnourished children most of who were not in school and learning. Their basic rights had being violated, exploited and they felt desolated. Most of them children were mostly orphans and some living with a form of disability. Since 2010, we have provided tuition assistance to over 300 children and over 500 children have benefitted from school supplies in 3 different communities we work in. However, in the course of our work, we realized that most children were falling sick while most girls stayed home because most schools lacked safe and clean pit toilets. Even when we asked these kids how they felt about the state of their toilet they were so happy and enjoyed using it. To address this health challenge we embarked on the construction of 3 clean and safe pit toilets in 3 primary schools that is currently serving over 1000 school children and has drastically eliminated the practice of open defecation hence ensuring that the health and immediate learning environment of these children is secured and safe.

Early this year our organization identified 2 more schools in dire need of a toilet and they currently under construction. The overall impact this has had on the communities, the children, their education and self esteem has been tremendous especially to the girls. Girls now can feel safe in schools, the
practice of open defecation completely eliminated and school absenteeism from ill related causes dramatically reduced.

Education is the only investment we can give to women and girls. It's very critical to ensure that girls can attend school and receive quality basic education. They must stay in school and complete their education and governments must ensure that conditions are created where girls and young women are safe, healthy, educated and fully empowered to realize their potential to transform their families, communities, economies and their societies.
Ending Extreme Poverty

Castillo de Varela, Her Excellency Ms. Lorena; Marlene Stoute
First Lady of Panama, Panama
Adviser, Permanent Mission of Panama to the UN, USA, mstoute@panama-un.org

“Biocommunity: A Multidimensional Approach to address Poverty in Panama”

“Biocommunity” is a multi-sectorial social initiative led by the First Lady of Panama, Ms. Lorena Castillo de Varela that aims to diminish poverty and extreme poverty. To address its root causes, Biocommunity sets to provide targeted services and sustainable programs in vulnerable communities. The program, based upon the Social Progress Index framework, focuses on improving access to basic human necessities as well as strengthening foundations of wellbeing and individual opportunities. The Social Progress Index was selected through the coordinated efforts among Government Ministries, academia, NGOs, private sector and civil society, as a standard indicator that could measure and evaluate comprehensively the multiple factors affecting poverty in Panama. The indicator will also allow for future follow-up mechanisms once the pilot programs have been well established.

Currently, the communities identified at social risk for the implementation of the program were chosen according to the Ministry of Finance’s poverty map and stretch over all national territory, including the indigenous regions of Guna Yala, Emberá Wounaan, Ngabe Buglé, selected provinces and communities at high risk in Panama City’s surroundings. In total, 14 communities and 2,460 homes are estimated to benefit from Biocommunity plans. The program’s subsequent phases will involve evaluating these communities’ institutional resources to create a Community Committee that will identify priority necessities. Thereafter, the Committee’s conclusions will provide a platform for the execution of social programs with the support of NGOs, government institutions, and local leadership. The long-term design is to make these Committees and programs sustainable through local participation and contribute to Panama’s Social Progress Index as well as the advancement of the United Nations Sustainable Development Goals (2015 – 2030).
Chukwu, Anayochukwu
PhD Candidate, University of the Witwatersrand, South Africa,
Anayochukwu.Chukwu@students.wits.ac.za

"Sectoral Output Growth, Poverty Reduction and Inequality in Africa"

Three recent authors (Suryahadi et al., 2009; Ferreira et al., 2010 and Loayza & Raddatz, 2010) have relied on a two-sector theoretic framework to demonstrate how changes in sectoral growth can affect the aggregate growth of countries, and by extension, welfare of the poor. While these studies and previous ones have presented different results for different continents, much of these results show that in Africa, the primary sector is the strongest in reducing poverty and inequality. This study reexamines this claim based on the belief that previous findings suffer from mis-specification and measurement errors. Our study presents alternative measurement and specification criteria on existing model in determining the actual impact of these sectors. We adopted a generalized method of moments (GMM) estimating techniques, and our findings were robust, and show that rather than the much-touted primary sector, the secondary and tertiary sectors are actually the main enhancer of welfare in Africa. The strongest inter-sectoral dependency lies between the services and agricultural sectors.

Jung, Woojin
Ph.D. Candidate, University of California, Berkeley, United States,
wjung@berkeley.edu

"More aid to needy countries?"

The critical question in the allocation of development aid is to what extent recent aid has been allocated based on a developing country’s needs, and if so, then what kinds of “needs” are being prioritized. Are more grants going to countries with low income, or to countries with large numbers of poor, or to countries deprived of basic health and education services? By examining predictors of global aid distribution, this study tries to understand the extent to which recipient needs, as measured by various development indicators, are significant determinants of the global aid distribution.

In particular, a question arises as to whether both monetary and multidimensional poverty measures have explanatory power of aid inflow. To verify this assumption, the difference in coefficients of aid predictors before and after 2000 is analyzed. Sector-based aid allocation is also examined considering that assistance targeted to a specific sector accounts for various facets of poverty such as deprivation in education and health. The paper uses a synthesized dataset from OECD, UNDP, and the World Bank. It contains net aid amount of 135 countries for the past 10 years (outcome
variable) and 30 dependent variables illustrating distinct economic, political and geographical dimensions of recipient needs and county profiles.

The results from the OLS, the Lasso path and classification and regression trees imply that the “needs” of the global South are predominantly measured by national revenue, population as well as poverty headcount. First, the OLS estimations do not provide strong evidence that countries with larger numbers of poor receive more development aid. Instead, a country’s low income and large population are positively correlated with a higher amount of aid. The results shows that 10% increase in the log of GNI per capita explains about 4.7% decrease in the total aid a country receives. Under the OLS, the log coefficient of poverty headcount is not statistically significant, holding other variables constant. The Lasso plot, however, places income poverty as an influential variable. When shrinking the less important variables’ effect, population growth and poverty headcount become the two most influential variables. Classification and regression trees on the other identified multidimensional poverty headcount (\&lt;1.645e+04 ) as the top splitting criterion.

In the OLS analysis of sector-designated aid, some evidence of progressive distribution is found in the health sector and its STD subsector. Countries with higher HIV/AIDS prevalence rate tend to receive higher amounts of aid, confirming that HIV prevalence rate is a powerful predictor of aid volume to health sector. an increase of 10% in the average HIV prevalence would result in a 4.61% change in average aid to the health sector. results are mixed for a policy shift driven by the MDGs, but it is noted that the tendency of favoring countries with high human development has slightly weakened since 2000. random forest methods confirm that income poverty head count, multidimensional poverty headcount, and HIV/AIDS rates are the three most important classifiers.

**Nweke, Eugene Ndubuisi**
Professor, Ebonyi State University, Nigeria, enweke1@gmail.com

"The quest to end extreme poverty and Gap crisis in Politics of Ownership in Nigeria: Lessons for sustainable Development Goals"

Nigeria is a country where seven percent of the world’s poor live, one of the top five countries that has the largest number of poor and ranks third in the world (World Bank.2014). This situation is perplexing considering the enormous resource base at the disposal of Nigerian state, as well as efforts and resources committed in the fight against extreme poverty. For this reason, poverty continuous to have an indelible mark on Nigerian citizens beside the opportunities provided by millennium development Goals. However the rate of extreme poverty has declined due to the performance of
millennium Development Goals. As MDG 2014 report on assessment on African progress notes, “the proportion of people living on less than US$1.25 a day, in Southern, East, Central and West Africa as a group decreased from 56.5 percent in 1990 to 48.5 percent in 2010. However, this figure is approximately 20.25 percentage points off the 2015 target compared to 4.1 for South Asia. On annual average, there has been an acceleration in the rate of poverty reduction; poverty declined faster over the 2005-08 period than over 1990-2005” (MDG Report on Africa 2014). Besides, the decline in extreme poverty, vulnerable Nigerians remains high. This has taken the nation far from eradicating extreme poverty as daunting challenges of decline in labour productivity, income inequality, low job creation, drought and unfavorable climate change, and malnourishment and underweight holds sway in Nigeria. These are prevalent because the policy and programmatic interventions designed to reduce extreme poverty is constrained by ownership gap. Ownership of policies is premised on the capacity of interest groups and individuals to be more effective by forming a critical mass that aggregates and articulates public policies. (Nweke 2011) Essentially ownership politics provides a synergy for attaining goals and objectives by providing enabling environment for both governments and citizens to accept or reject or modify policies and programmes in line with their desires. This paper anchors on this premise and argues that millennium Developments Goal has failed to attain the target of 21.40% poverty reduction by 2015 due to gap in politics of ownership. Therefore, the ‘Common Agency Theory” analysis the origin of vision, participating stakeholders and understanding of extreme poverty, and explains how ownership crisis is impeding on attaining MDG 1, eradication of extreme poverty. The study finds that MDG is comprehensive and driven by goal, but shortchanged in delivery by lack of adequate consultation and low level understanding and participation of the citizens. As a result the state dominates the programme to the exclusion of target beneficiaries and promotes ‘one size fits all syndrome’ which negates need diversity of stakeholders and unity of purpose in poverty reduction strategies. The study concludes that Post -2015 project must learn and adopt common agency approach that promotes the inclusion of non-state actors if the rate of population in extreme poverty in Nigeria must reduce to target.
"Improving the Poors' Small Business Outcomes through Strengthening the Microfinance 'Group Loan Approach'"

A significant majority of the extremely poor people in Africa struggle to earn a living from unstable small businesses in the informal sector due to lack of sufficient capital to sustain and expand their businesses. Usually, they are unable to access loans from commercial banks due to lack of the collateral these banks require. Microfinance institutions fortunately provide them with easier access to capital by using what is known as a ‘group loan approach.’ This approach provides the extremely poor in the informal sector with a convenient way to access loans because it overrides the need for substantial individual collateral. For this approach to work effectively, group members have to successfully collaborate in order to avoid defaults and late payments that result in costly fees. Failure to collaborate may also undermine microfinance institutions’ financial capacity to help other segments of the extreme poor. Hence, both microfinance institutions and the entrepreneurial poor can benefit from a ‘group loan approach’ that ensures maximum collaboration. This can be done by improving how groups operate and function. This paper seeks to propose ideas for doing so by examining how 300 business owners’ groups from the informal sector in two of Kenya’s cities (Nairobi and Kisumu) function. It uses originally collected survey data from 18 markets across the two cities. The paper identifies factors that hinder the collaboration these groups need in order to achieve successful outcomes from microfinance loans and proposes ways to ensure maximum collaboration. The goal is to enlighten microfinance institutions and small business owners about the factors that can reduce or stop late payments and defaults. It analyses two aspects that can facilitate these outcomes: 1) group structure (number of people in a group, age groups, gender, and familial versus nonfamilial relationships), and 2) group operations (formal versus informal rules, recruitment and orientation procedures, enforcement of rules and meeting procedures). The paper further seeks to shed light on business outcomes that emerge from different group structures and operations by examining the following outcomes at the individual level: changes in profit levels, business stock, business sales and savings. Since the poor primarily engage in these businesses to improve their living standards, this paper also examines the relationship between the characteristics of groups the individuals belong to and their ability to meet their household needs, namely rent, family and personal expenses. The paper ultimately proposes ideas for designing effective group operations that enable extremely poor business owners in the informal sector to minimize late payments and defaults, and thereby improve their living standards. It shows how well designed group
loan structures can lead to successful business outcomes and fulfillment of household needs. The ultimate outcome of the paper is an evidence-based idea for a ‘group loan approach’ that leads to successful small businesses that improve the living standards of the poor. This idea can advance global efforts to end extreme poverty by improving microfinance institutions’ strategies to extend financial services to unreached segments of people living in extreme poverty.

Park, Tae In
Ph.D. Candidate, Yonsei University, Korea, Republic Of, taeinpark@gmail.com

"Cooperatives and the Sustainable Development Goals: The Role of Cooperatives in Poverty Reduction"

A cooperative is defined as “an autonomous association of people united voluntarily to meet their common economic, social and cultural needs and aspirations through jointly-owned and democratically-controlled enterprises (International Labour Organization, 2002).” The cooperative principles include: (1) voluntary and open membership; (2) democratic member control; (3) members’ economic participation; (4) autonomy and Independence; (5) education, training and information; (6) cooperation among cooperatives; and (7) concern for community. Indeed, cooperatives are member-driven business enterprises in which decisions balance the pursuit of profit with the needs and interests of members and their communities. One billion people are now members of cooperatives worldwide. In seeing the potential for cooperatives to amplify efforts for sustainable socio-economic development, the United Nations declared 2012 the International Year of Cooperatives.

Though the specific goals, targets and indicators will not be agreed upon until September 2015 as part of the ongoing process, it seems obvious that poverty reduction will be listed as one of top priorities of the sustainable development goals (SDGs). Having said that, cooperatives are highly relevant and important in the realization of the SDGs. There is a widely held consensus among many actors, including the United Nations (UN), the International Labour Organization (ILO), and the International Co-operative Alliance (ICA), that the cooperative enterprise is the type of organization that is most suited to addressing all dimensions of reducing poverty and exclusion. The way cooperatives help reduce poverty is important - they identify economic opportunities for their members; empower the disadvantaged to defend their interests; provide security to the poor by allowing them to convert individual risks into collective risks; and mediate member access to assets that they utilize to earn a living (ILO and COOP, 2014).
Considering the significant role of cooperatives for poverty reduction, this paper reports on international case studies of cooperatives in Sub-Saharan African countries including Ghana and Ethiopia. In Ghana, members frequently obtain loans from the University of Ghana Cooperative Credit Union to support informal businesses that supplement their wage income; and in Ethiopia, 900,000 people in the agricultural sector are estimated to generate most of their income through cooperatives (ILO and COOP, 2014). This paper considers the topic in four sections: a conceptualization of poverty, sustainability, and cooperative; an overview of the two countries’ cooperative movements; case studies of how different resources and competencies from various key players were combined and shared in the two countries’ cooperatives; and, finally, conclusions that highlight how cooperatives can be used to develop more systematic strategies for poverty reduction and achieving the SDGs.

Puerta, Diana  
MDP Candidate, Universidad de los Andes, Colombia,  
dm.puerta10@uniandes.udu.co

"Nutri-entrepreneurship - Soydoy"

35% of Colombian children are underweight at birth, and 1 of 8 children between 0 and 6 years old suffer from chronic malnutrition. The Soydoy Foundation in Colombia, helps to eradicate hunger and extreme poverty through: nutri-entrepreneurship and food family meetings. Thanks to this intervention, Soydoy have successfully established 30 enterprises in subsistence food markets, and contributes to eradicate malnutrition of nearly 3,400 children living in these area.

The objective of this abstract is to present the case study Soydoy Foundation in Colombia, an initiative that is improving the quality of life Colombian citizens living in subsistence markets, through the development of a nutri-entrepreneurship. I analyze the case based on the findings of my fieldwork experience, and on the theoretical framework provided by the MDP.

The article will explore the experience of Soydoy in two Colombian cities: Bogota and Quibdo. It highlights the barriers for the economic growth in subsistence markets where vulnerable populations lives, and it exposes Foundation Soydoy’s strategy in these cities.

Soydoy strategy is based on establishing bakeries through partnerships with women who live in subsistence market places. They prepare food according their manners but with quality and with soy. The soy enhances the nutritional value of each food. These nutri-entrepreneurships become an option of income for their owners, and a choice of nutritious and safe food in
these markets. Traditionally, the bakeries in subsistence markets, produce low price and quality food.

The subsistence markets are understood as markets made by people and small businesses operating in contexts of poverty, with the primary purpose of survival. These entrepreneurs are in the social environment of their customers and operates with severe resource constraints, uncertainty, financial or personal difficulties and external threats - Risks eviction by state authorities and pressure and extortion by armed groups outside the law - causing, in most cases, displacement.

This case illustrates the usefulness of a bottom-up design to provide relevant solutions to enhance livelihood in subsistence markets. People participation in the design of their own solutions, contribute to the empowerment and sustainability of the initiatives in the bottom of the pyramid, as it has done the Soydoy Foundation, provides relevant solutions, created with people collaboratively.

The evidence (non-experimental) related to the eradication of poverty, that is presented in this case, is related to do projects with the community as a sustainable solution. The Nutri-entrepreneurship improves the income and improves the nutrition increasing the people opportunities. The main finding of this fieldwork is related to the 50% increase in revenue each nutri-entrepreneurship woman and the malnutrition decrease in each of their families.

References
Vojtkova, Martina
Evaluation Specialist, International Initiative for Impact Evaluation (3ie), United Kingdom, mvvojtkova@3ieimpact.org

"What we know and don’t know about solutions for poverty eradication: Evidence gap map of productive safety-net interventions"

Despite recent successes in poverty reduction, an estimated 1.2 billion people around the world still live on less than 1.25 dollars a day. An even greater number - about 2.2 billion people – live in or near multidimensional poverty, suffering severe deprivations in health, education and living standards. Projections for 2030 range from fewer than 150 million to more than 1.2 billion people remaining in extreme poverty. The final step of eradicating extreme poverty thus presents an important global challenge requiring targeted and highly effective solutions. An evidence-based approach to poverty reduction programming can help identify effective programmes and target these to the people who can benefit most. Given the vast amount of research and evidence in this field, a crucial first step is to identify what we know and don’t know, about what works to help people sustainably escape extreme poverty and deprivation.

To help decision-makers explore the existing evidence, and to identify where more research may be needed, 3ie has produced an Evidence Gap Map (EGM) of productive safety-net programmes. Productive social safety-nets are programmes that include livelihood or income generating components to expand market opportunities for the extreme-poor. The EGM consolidates what we know about the effects of productive safety-net interventions. Based on a comprehensive search of the published and unpublished literature, it provides a visual overview of evidence from 248 impact evaluations and 24 systematic reviews. The included studies are mapped into a framework of relevant interventions and outcomes. These cover six broad intervention categories such as financial services, land reform and microenterprise support services, and important poverty alleviation outcomes along the causal chain. Through 3ie’s online platform, the EGM also allows users to interactively explore the evidence base, easily identify studies of interest and access their findings through links to user-friendly summaries on the 3ie databases. The EGM thus presents a practical tool for getting started on achieving the sustainable development goal of ending extreme poverty.

One of the startling findings from the EGM is that despite a wealth of impact evaluation and systematic review evidence, only a small proportion of the included studies explicitly measure the effects of productive safety-nets on income poverty, income inequality and adaptive capacity. Almost half of the included evaluations do not report any information relating to the poverty status of the studied populations and those that provide this information use varying definitions of poverty. These gaps in the evidence base make it
difficult to reliably assess whether safety-net interventions help people escape poverty.

This presentation will provide a demonstration of the Evidence Gap Map on 3ie’s open-access interactive platform and highlight some key findings about the evidence base in this field. It will draw on the included high quality systematic reviews to present findings that can inform policy and programming aiming to eradicate extreme poverty. It will also identify key ‘gaps’ in both systematic review and impact evaluation evidence that can help inform future strategic research commissioning in this field.
Financing for Development

Chebly, Juan
PHD Candidate, Simon Bolivar University, United States, Juan.chebly@undp.org

"The Present Value of Future Generations: Prioritizing Public Spending for Sustainable Development"

The devastation and estimated casualties nearing 100 million human beings, by the end of the Second World War led world leaders to work together and create a common institution for peace, development, and human rights. The United Nations (UN) was created with a mandate of peace, development and human rights worldwide.

Poverty, increasing inequalities, natural disasters, climate change, environmental degradation, social decay, conflict, and other calamities have posed great challenges to peace, development, and human rights worldwide. Three generations and 70 years of deliverance have led to consensus among United Nations member states around an ethical normative framework that considers a trans-generational approach to its given mandate: a sustainable development agenda and the proposed Sustainable Development Goals (SDGs).

While we as humanity seem to agree on ‘the what’ needs to be done, by agreeing on 17 proposed SDGs to be launched by the UN General Assembly in September 2015, there is still a big question mark on ‘the how’ are we to implement the sustainable development agenda. The underlying question on how are we going to finance sustainable development also remains. ‘Status quo’ and ‘business-as-usual’ approaches have called the SDGs as an ambitious to-do-list that will be practically unachievable. The main argument behind this approach: the SDGs are too many, too ambitious, and more importantly too expensive to be achieved by the year 2030.

The purpose of this work is to explore how global public finance prioritization, looking especially at global military spending and defense budgets, in search for a more efficient approach to better deal with the opportunity costs between defense and development. The need for a sustainable development agenda is not only enameled in international law and human rights, but has also been validated by social inclusion and participation. Millions of people were consulted in the design of the sustainable development agenda, yet not too often are citizens consulted on how their governments are to prioritize their spending. Skeptics often highlight that the sustainable development agenda is not legally binding, but rather subject to voluntary commitment by UN member states. However, member states have a moral obligation to their people, and many may also
argue that morality supersedes legality and not the other way around. Changing the status quo and business-as-usual approaches to public spending can guarantee resources are re-directed to successfully achieve the sustainable development goals by 2030.

Delpiazzo, Elisa; Parrado Ramiro, Standardi Gabriele
Junior Researcher, CMCC-Euro Mediterranean Center for Climate Change, Italy, elisa.delpiazzo@feem.it

"Analyzing the coordinated impacts of climate policies for financing adaptation and development actions"

The global economy of the 21st century will unequivocally face long-term challenges such as demographic changes, globalization, as well as climate change. Development strategies have to address that phenomena coordinating efforts from private and public agents and mainstreaming policies in search of synergic outcomes. Concerns about fiscal sustainability and fiscal implications of these long-term processes for the long run have been put forward for discussion since the beginning of the century (Heller, 2003). These processes will open new dimensions in fiscal planning given that they point towards concepts such as anticipation, mitigation, and adaptation.

Many factors may threat fiscal sustainability. Aging population, welfare state reforms, rigidities of labor markets, and the recovery from the global crisis, have contributed to robust debt levels. Climate change is rapidly growing as a challenge for the 21st century but could also provide good reasons to address all the above-mentioned issues in a sustainability framework.

Current and future policies must deal with mitigation and adaptation to climate change. This brings a window of opportunity to include these actions in a development strategy that can benefit society in the future. While adaptation policies will address the expected impacts that cannot be avoided for the future, mitigation policies will help to decrease greenhouse gas emissions, and therefore reduce future impacts of climate change. From the development point of view, mitigation policies could help to induce innovations for a green economy and, most importantly, raise government revenues, which can then be used to finance adaptation policies as well. Therefore, if governments start taking into account the implications of long term challenges for development and not only looking at short run implications, their actions could pave the road for a new sustainability paradigm in the near future.

Many are the climate change impacts governments will have to focus on. From sea level rise to extreme weather events (cyclones, hurricanes, storms)
and these events will affect the world differently. Developing countries have a higher vulnerability to climate change and in addition, they face very important challenges as poverty reduction, energy access, education and health.

This paper focuses on the implications of climate policies on fiscal budgets, and on the financing of adaptation and development actions using revenues from a specific policy such as a carbon tax that could raise enough resources to foster a sustainable development while reducing emissions. Revenues raised in developed countries are pooled in an “Adaptation for Development” fund to provide additional resources to developing countries. Two impacts of climate change are analyzed. The first one is sea level rise that requires important adaptation investments to cope with future impacts. The second refers to extreme flood events that could bring several damages that could also be avoided with anticipatory adaptation investments.

The analysis is performed with a multi-region and multi sector computable general equilibrium model modified to enhance the public sector representation as well as to include mitigation policies and adaptation expenditures in anticipatory actions relying on infrastructure investments.

Lhoukhokai, Sithhou; Navreet Kaur
P.hd Candidate, Department of Public Administration, Panjab University, Chandigarh, India, lhous00123@gmail.com
Assistant Professor & Chairperson, Department of Public Administration, Panjab University Chandigarh, India, navreet9@gmail.com

"Governance of Development Assistance: Issues and Challenges"

Governance is encompassing phenomenon than Government. The term 'Governance' is a qualitative expression, a normative concept different from entity. (Singh 2012) Contemporary movements for governance reforms emphasise upon efficient and effective institutional mechanism, greater transparency, people participation, citizen centric services and more accountability. These reforms are not only limited to national governance practices but also applicable to distribution, disbursement and effectiveness of development assistance. The objective of development assistance is to provide opportunities to needy, deprived and disadvantageous sections of the society. As per available data (Homi Kharas, 2007) Development Assistance from rich countries (DAC members) to poor countries topped US$100 billion in last two years. Non-DAC bilateral assistance (NDBA) is more than $8 billion annually and private aid from DAC members contribute between $58-68 billion annually. Total aid flows to developing countries currently amount to $ 180 billion annually. The harsh reality is that in spite of generous development aid, there is high percentage of illiteracy, high child
mortality, higher gender inequality, prevalence of corruption and exclusion of needy people in development process in majority of developing countries in Asia and Africa.

The introspection of the process and procedures involved in development aid pointed towards many challenges in process adopted for allocation, methodological limitations, evaluation limitations, lack of coordination among multiple agencies, political compulsions of donor and recipient country, lack of transparency and accountability and multidimensional global financial market compulsions.

The problem begins with changes in the framework for development assistance. The increase in number of donors has led towards fragmentation of aid and assistance per development programme has shrunk. The complexities in the structural framework have directly affected the functional aspects in the recipient countries.

Keeping in view current challenges, certain measures must be adopted in order to make development more inclusive and sustainable. Proper management and strategic interventions by the state, non-governmental agencies and active participation of citizens can translate plans and policies into practical realities. Changes in structural and aspects in allocation and disbursement of development aid such as coordination of all multilateral agencies, impact evaluations, capacity building of target population, methodological changes in implementation as per country’s need and constraints and encouraging Inter-Agency partnership and Public-Private Partnership will certainly pave way towards more inclusion of needy people in development process.

Integration of traditional agencies and non-traditional donors should also be encouraged to make governance people centric, sustainable and result oriented. There is also need to set standards and penalties for non-performance even in development assistance programme also at country level and delimitation of funding at international level. Such mechanism of check will ensure the sustainability and longevity of the development programmes.
Miola, Apollonia; Catherine Simonet
Senior Scientist, European Commission JRC Institute for Environment and Sustainability, Italy, apollonia.miola@jrc.ec.europa.eu

"Fit for purpose metrics to guide global action for climate resilient development within the context of the new Sustainable Development Goals"

Many initiatives are in place, or have been announced by governments, companies, investors and public-private coalitions to support climate adaptation and resilience for the world’s most vulnerable countries. Global efforts to set the world on a climate change resilient development pathway require an understanding of the relationships between climate change and development, as well as metrics for the identification of the countries, groups of people and sectors most seriously threatened by climate change. Despite the proliferation of alternative indicators, most existing measures do not capture the multidimensional aspects of climate resilient development.

Most climate risk indices often show some limitations, as their theoretical framework is vaguely defined (or even completely missing) and, as a result, the indicators used are not always relevant and focus on current climate risk as opposed to future hazards. Moreover, the economic and ecological aspects are often neglected, or ill defined.

This paper aims to fill this gap. It reviews five indexes with a global coverage measuring all or just a few components of climate change risk. Final aim is to highlight crucial weakness that should be addressed to provide a comparison of vulnerability to climate change between countries, and the identification of areas for adaptation intervention within the context of the Sustainable Development Goals.

Parhi, Pradipta
Graduate Research Assistant (PhD Candidate), Columbia University, United States, pradiptaparhi@rediffmail.com

"Aggregated risk management of index insurance portfolios in the tropical developing countries"

The market penetration of index or crop insurance sector, posed as a weather risk management and climate change adaptation tool for the poor farmers, is growing in the tropical developing countries. Usually the underwriters such as regional, national or international organizations, banks or (re)insurance companies hold these risk portfolios. The micro-level insurance contracts when aggregated at state, regional or country level, could potentially pose significant systemic risk threatening the micro- financial risk management sector and ultimately impeding the sustainable development
goals. Analyzing the observed inter-annual variability of the tropical climate system, this paper identifies the mechanisms for heterogeneous climatic response and suggests that diversification opportunity exists across different regions and seasons.

Taking two case studies from tropical Africa, an empirical analysis is done to highlight that El Niño modulates the number of wet days in an opposite way across two regions and seasons. Specifically, El Niño is associated with drier condition over Sahel, while it is associated with wetter condition over Tropical Eastern Africa (TEA), during their respective Jul-Aug-Sep and Oct-Nov-Dec rainy seasons. Such contrasting modulation in the number of wet days can be understood by the phase relationship between the local rainy season and El Niño evolution stage. The transient phase of El Niño, which is in phase with the rainy season (Jul-Sep) over Sahel, is characterized by tropospheric stability induced by tropospheric warming without regional North Atlantic sea surface temperature (SST) adjustment. In contrast, the mature phase of El Niño is in phase with the short rainy season (Oct-Dec) over TEA, and is characterized by adjusted warmer regional Indian Ocean SST and increased onshore-advection of moisture from the Indian Ocean.

Since there is a partial resemblance of El Niño-like warming and anthropogenic global warming, insights from this analysis with observational data supports the idea of a heterogeneous rainfall response to global warming, further supporting the possibility of diversification of the index insurance portfolios across regions and seasons.

Petretta, Danielle
Ph.D. Candidate, Columbia University, United States, dlp43@columbia.edu

"How Can Value Capture Strategies Unlock Desperately Needed Funds? Getting Serious about Sustainable Transport Finance"

Infrastructure provision has traditionally been the responsibility of the public sector, typically tasked with its delivery and maintenance. Increasingly, however, it has become more and more difficult for governments alone to meet the urgent and ever-increasing global need for social and physical infrastructure.[1] Shrinking budgets, unreliable funding sources and inefficient revenue generation necessitate the need to explore other, less traditional models of infrastructure investment, finance and provision to meet humanity’s growing needs for new capacity and to even maintain the integrity of existing stock.

The magnitude of necessary investment is staggering. According to the Addis Ababa Action Agenda, the annual infrastructure funding gap for developing nations alone is between US$1 to 1.5 trillion. [2] The issue is universal,
where estimates of necessary investment even in the US reach US$3.6 trillion through 2020 just to bring the nation’s infrastructure to a minimum state-of-good-repair. [3] To meet such steep demands, infrastructure investment cannot continue along the business-as-usual path and will need to be supported by all stakeholders and beneficiaries, public and private.

Value capture finance offers one practical solution to this monumental challenge. In theory, value capture promises self-sustaining, unrestricted, revenue streams, where investment leads to access, access leads to value, value can then be extracted and reinvested in a continuous iterative, sustainable cycle.[4] This paper explores and compares value capture schemes related to urban mass transit provision in three global cities. By assessing value capture strategies put in place in Hong Kong, New York and London, it becomes apparent that although all investment has inherent risk, a multi-tiered structure can begin to insulate against shocks and generate positive cash flows. By applying best principles such as overlapping layers of potential revenue based on varying timeframes, beneficiaries and users, a reliable, more innovative finance mechanism can prove to be sustainable. Combined value capture mechanisms of betterment taxes, joint-development and levies on new construction, worked to help finance capital costs of London’s Crossrail -- a new east-west transit line fully funded and currently under construction.

References
[1] Physical, or hard infrastructure, refers to the physical networked systems needed to support economic activity including basic service provision such as water, energy, communications, sanitation and transport. Social, or soft infrastructure, refers to schools, health care facilities, and other cultural and social support systems.
[3] In their Infrastructure Report Card, the American Society of Civil Engineers gives the nation’s infrastructure a grade of D+ in 2013, unacceptable even if up slightly from the previous report card grade in 2009 of a D.
Saliou Kokouma, Diallo Mamadou  
PhD Candidate, School of Economic and Management, Southeast University, China, salitadiallo@yahoo.ca

"Chinese Foreign Direct Investment (FDI) in Guinea: The Prospect of Sustainable Development"

In recent years, the world has contended with the fact of China’s rise as a major locomotive of the global economy being a new economic superpower. Whereas much of China’s economic clout which is reshaping the way the global economy functions has been attributed to its wide domination of world trade and investment. It is widely accepted that little attention has been paid to the country’s ‘going-out’ strategy that was officially made public at the beginning of this millennium. This paper seeks to examine the determinants and policies of Chinese FDI in Guinea in the prospect of sustainable development. Factors such as the country’s landlockedness, weak infrastructure, lack of policy transparency, red-tape tendencies by government agencies, language and cultural differences, corruption and weak governance structures and promotion policies poorly designed investment are identified as responsible for the prior poor record in terms of attracting Chinese FDI in the country compared to its West African counterparts. This study used mainly qualitative and quantitative research techniques. Data, variables and analytical ex-post factors are used. Data collected for this study was based on resultant sources of data and comparative analysis from different sources. The study stresses the need for more trade and investment cooperation between China and Guinea in sectors that will lead to a win-win situation. It also argues that Guinea should pay more attention to the improvement of relations with existing investors and offer them incentives to assist in domestic marketing investment opportunities to potential Chinese investors in Guinea for her sustainable economic development.
International Science-Policy Interface 2.0: Research Coordination in Support of the SDGs

Ivanova, Maria
UN Scientific Advisory Board and University of Massachusetts, USA

Kanie, Norichika
Professor, Keio University, Japan, kanie@sfc.keio.ac.jp

Nilsson, Måns
Research Director and Deputy Director at Stockholm Environment Institute and Professor of the Practice of Environmental Strategies and Policy Analysis at the Royal Institute of Technology (KTH) and Independent Research Forum

Reyers, Belinda
Stockholm Resilience Centre and Future Earth, Sweden

Shrivastava, Paul
Executive Director, Future Earth, Canada, paul.shrivastava@futureearth.org

Someshwar, Shiv
Professor, Columbia University, USA, shiv.someshwar@unsdsn.org

Ullah, Farooq
Executive Director, Stakeholder Forum, UK, fullah@stakeholderforum.org

The purpose of this session is to discuss how the research community can support the SDGs and promote their implementation. The research community, through for example Future Earth, Sustainable Development Solutions Network (SDSN), International Council for Science (ICSU) and the Independent Research Forum (IRF), has participated in the formulation of the SDGs and remains committed to their successful implementation. This session discusses key issues such as integrating environment and development across spatial levels, and effective science-policy interface to support the SDGs, and the critical challenges involved in promoting evidence-based goals' implementation.
Governance (Including Peace Building & Justice)

Chan, Koon Hong  
Chevening Scholar, University College London (UCL) School of Public Policy, United Kingdom, chankhdan@gmail.com

"City Diplomacy and “Glocal” Governance: Towards a Cosmopolitan World Order"

Diplomacy is in trouble. With globalisation come global problems. While we live in a 21st-century world of interdependence, we face 17th-century Westphalian political institutions with defined boundaries and separated responsibilities of the nation-states. Diplomacy is embedded in this “globalisation dilemma.” While diplomacy anchors in state-to-state dialogues, the current inter-state system fails to fight the world’s fights, which are trans-border in nature, global in scale. The world becomes “paralysed.” International policymaking suffers from “democratic deficits.” My answer to this “globalisation dilemma” and “democratic deficits” is city diplomacy and “glocal” governance.

In Part I, I will revisit classical Chinese philosophy da-tong (great unity), cosmopolitan democracy, and Athenian democracy, and reflects on the cosmopolitan characteristics of cities. I argue that the road to cosmopolitan democracy does not run through states. It runs through cities. With city diplomacy, “trans-municipal networks” (TMNs) transcend nationality for the common good of humanity; with “glocal” governance, citizens have the potential to participate in global policymaking through local institutions.

In Part II, drawing on Dahl’s (1999) two aspects of democracy and De Búrca’s (2008) “democratic-striving approach,” I will reflect on the elements of democratic global governance. I will develop two “building blocks” of democracy at international level—equal participation and popular control. In a normative sense, city diplomacy and “glocal” governance are adherent to these two “building blocks.”

In Part III, I will evaluate to what extent the actual performance of C40 Cities Climate Change Leadership Group (C40), one of the most established TMNs at present, operationalise these two “building blocks.” This empirical study references to four Member Cities, namely London, Rio de Janeiro, Johannesburg, and Hong Kong. In practice, C40 does not fully satisfy the two “building blocks;” however, it provides a potential and realistic account towards a cosmopolitan world order.

Dilyard, John

Presenters are listed first followed by additional authors. Contact information is for presenters.
"Private Firm Governance in the Context of Sustainable Development Goals"

‘Sustainability’ has been an espoused objective of private sector firms for quite some time. While what sustainability actually means can be different for virtually every firm, a workable definition can be the ability of the firm to continue to be a viable entity, where viability is a combination of profitability and competitiveness. And although the notion of sustainable development with respect to environmental issues has been around since the early 1990s, today sustainable development as envisaged by the United Nation’s sustainable development goals incorporates the interactions, interrelationships and interdependencies between the economy, society and the environment. Sustainability in the United Nations context contains a societal as well as economic element and implies the formation of a partnership involving a variety of private, public and public/private constituencies. A supportive governance structure has evolved to help achieve firm-specific sustainability, but good questions to ask are: What are the governance structures that need to be in place to enable private sector firms to engage fully with the UN’s sustainable development agenda?; What needs to change?; and, if change is needed how is it accomplished?

This presentation will be based on the results of a caucus at the Academy of Management annual conference (in early August 2015) in which these ideas will be pursued. In particular, the caucus will be a comprehensive exploration of (a) the link between governance in private sector firms and the determination and attainment of firm-specific sustainability objectives, (b) the link between governance in private sector firms and the private sector’s ability to support broader societal/economic sustainability objectives, and (c) if governance in the private sector has to change in order for it to support those broader societal/economic sustainability objectives. Considering that virtually every large multinational corporation (and many, many more smaller ones) have incorporated the idea of corporate social responsibility (CSR) and sustainability in their annual reports, it is reasonable to presume that these companies acknowledge that CSR and sustainability resonate with at least a subset of their stakeholders. With the adoption of more universal sustainable development goals that involve governmental and trans-governmental agencies, however, will cause management in private sector firms to readdress to whom and/or to what it has to answer as it pursues its CSR and sustainability goals. Questions for which this presentation will have possible answers include: Who determines what a firm’s corporate social responsibility (CSR) should be? How should sustainability for a firm be defined? How are CSR and sustainability practices monitored/measured? What is more important, increasing shareholder wealth or societal wellbeing? What role should the private sector have with respect to societal/economic sustainability?
Galimova, Lenara  
Junior Research Fellow, PhD Candidate, Kazan Federal University, Russian Federation, galimova.lenara@gmail.com

"Environmental Protection, Economic Development, and Social Equity: Fragmentation among Sustainability Goals and Programs in Phoenix, Arizona"

This study examines sustainability initiatives adopted by the City of Phoenix, and assesses their promise for transforming Phoenix into a prosperous and sustainable city. Also, the paper identifies the main barriers to sustainable development for the local government. The study integrates different data collection methods including the analysis of city documents, in-depth semi-structured interviews with city officials and employees, and observations. The research findings indicate that while the City of Phoenix has officially established sustainable development as a priority for city, it reduces sustainability to environmental stewardship. Lacking of any sustainability plan, the local government focuses on environmental sustainability initiatives, primarily greenhouse gas emissions reduction, transit-oriented development, efficient resource use, and waste management, while social and economic aspects are not being addressed; this in turns leads to fragmentation among local sustainability goals and strategies. Although the local government has started to recognize the importance of sustainability actions promoting all three aspects of sustainable development, there are barriers hindering the developing of a comprehensive sustainability plan and its successful implementation such as misinterpretation of the key goals of sustainable development among city officials, inadequate funding, poor public commitment to sustainable development, limited interaction and weak cooperation between city departments.

Magalhães, Paulo  
Researcher  
Interdisciplinary Centre of Social Sciences : CICS.NOVA, Faculdade de Ciências Sociais e Humanas - FCSH/NOVA, Portugal, paulmaga@gmail.com

"Common Natural Intangible Heritage of Humankind - A legal global support for peace and justice."

In International Law, sustainability usually does not address the prior theoretical structural problem of the existence of the 'Whole' in- and outside of States, or in its trans-temporal 'Humanity'. Global Commons have always been understood only as geographical spaces that existed outside political
borders. The global, diffuse and intangible nature of a stable climate (in- and outside of States) made this approach dysfunctional.

The concept of Common Concern of Humankind was introduced to deal with problems found both within and outside sovereignties. The space-time inadequacy of existing legal instruments, transform these problems into indeterminate, diffuse and inoperative concepts. Some authors still consider the Earth System as an unidentified legal object— an ULO (Melot and Pélisse, 2008). The result is a large legal vacuum through which vital factors "disappear" as externalities (positive or negative).

Only through a comprehensive global legal support will it be possible to account for the positive and negative 'externalities', which we all bring about upon the state of the Earth System. This is a structural pre-requisite for constructing equity and confidence in the process.

The doctrine defines the Common Concern as a Living Space (Shelton, 2009). Theories of International relations (Complex Sovereignty) distinguish space from place (Giddens, 2007) and have started to construct functional spaces without territory in order to pursue interests, which no State is able to secure in an isolated manner. In this structural evolution, the absence of a political and territorial Locus is the main problem to be overcome. The Safe Operating Space of Humankind and Living Space are functional spaces without territory and both lack legal existence and a Locus as operational support to generate rights and duties.

From the combination of territoriality of the Common Heritage of Mankind and the derived concept of Common Concern of Humankind it becomes possible to abandon the reductionist approach of Law based on physicist or biological characteristics of nature, towards the intangible bio-geophysical realities that determine the state of the Earth System. From this new approach it's possible to start conceiving alternative conceptions of global coordination, without affecting the constituent elements of sovereignty.

A sustainable economy implies that ecosystem services do not legally disappear in the invisibility of global but become economically visible. Before undertaking a practical institutional reform, we need a solution concept that bridges the gap between the theory underlying the organization of International institutions and the reality of Earth System dynamics.

The Planetary Boundaries concept allows us to measure what was indeterminate and diffuse, and define the favorable state correspondent to the geological period of the Holocene as a new "Global-Common’, allowing it to be managed in an international and institutionalized manner.
The recognition of a well-defined status of the Earth System as Common Natural Intangible Heritage of Humankind will be the Locus upon which a system for management and maintenance of its common use can be build, essential for steering the Anthropocene. This new space without territory will be the new object of global governance.
Greening Cities

Beaumont, John Russell
2014 Marshall Scholar; Candidate for MSc in International Development, Candidate for MArch in Architectural Design, University of Manchester, United States, russbeaumont@gmail.com

"Beauty and Design for Human Dignity in Post-disaster Settings"

In post-disaster situations, immediate humanitarian needs necessitate an urgent response using limited available resources. This sense of urgency often results in the prioritization of economic and material efficiency over aesthetic considerations. Furthermore, because post-disaster emergency housing is transitional, it is seen as inessential to invest in humanizing design elements within these temporary housing solutions. This paper, however, suggests that sacrificing aesthetic design for economic efficiency is problematic. Analyzing the role of beauty and design in dignifying the experience of living in emergency housing will provide an alternative paradigm for post-disaster housing—one which holds social, cultural, and psychological needs as determinates for architectural and urban design. After examining the philosophical and historical roots of human dignity, the role of beauty in dignifying the experience of emergency housing will be explored using empirical and theoretical comparisons. The post-earthquake reconstruction efforts by architecture firms Elemental and MASS Design Group, in Chile and Haiti respectively, will serve as successful case studies of humanizing design. In particular, beauty as a subjective experience will be used to inform policy suggestions which see stakeholder participation in the design process as an opportunity for dignifying the experience of post-disaster displacement.

Croci, Edoardo; Aldo Ravazzi Douvan
Research Director, IEFE, Centre for Research on Energy and Environmental Economics and Policy, Bocconi University, Italy, edoardo.croci@unibocconi.it

"Urban Road Pricing: the experience of Milan"

Urban road pricing schemes have been designed in order to reduce externalities generated by traffic. Main impacts regard: time loss due to congestion, local pollution, noise, contribution to climate change caused by emissions of GHGs, pavement costs and road damages, increase in accidents risks, extra-fuel consumption, decrease in quality of life. Moreover road pricing schemes generate public revenues.
This paper analyzes the urban road pricing experience of the municipality of Milan, where the scheme (named “Ecopass”) had been in operation as a “pollution charge” since 2007 and shifted to a “congestion charge” (named “Area C”) since 2012. Both schemes have delivered relevant results regarding congestion reduction, public transport speed increase, air quality improvement. Traffic reduction dropped from -20.8% in the first year of Ecopass to -10.8% in 2011, because of car substitution of older charged vehicles with new uncharged vehicles. In 2012 and 2013 Area C substituted Ecopass and traffic decreased by about 38% with respect to base year 2007.

A comparison with the results of congestion charging in London and Stockholm is made. The three systems have some common as well as differentiated features. In all cases the following trend effects, though in different measures, are demonstrated: traffic reduction and modal shift, mainly through increase of passengers of public transport. A relevant pollution emission reduction happened in Milan and a significant one in Stockholm, while the effect was negligible in London. In Stockholm and Milan also accidents reduction and speed increase in public transportation were experienced. In all cases traffic reduction happened also in the area surrounding the charged ones. No negative effects were registered on retail and real estate values in the areas. All cases show a high deterrent effect of the charge in the use of cars to enter the areas, referred to all traffic and in particular to chargeable traffic.

Lack of data and different methodologies in monitoring and evaluating data limit our analysis. Nevertheless it is possible to make a comparison of elasticities of traffic to charge in the three cities. Elasticity values are systematically higher than elasticity values to fuel price and even to traditional tolls for roads and bridges. In all cases there is no evidence of a decrease of elasticity over time.

Urban congestion charging, though limited to pioneer experiences, is able to reduce congestion in an effective way. The design of the schemes and the measures enacted by the municipality to take advantage of traffic reductions can determine actual results.

Koski-Karell, Natalie
Student, UC Hastings College of the Law, United States, koski-karell@uchastings.edu

"Community Integration of Solar-Powered Rubbish Units in Tourist Heavy Economies"

Bali attracts more than 10 million international visitors a year. With a living population of four million, mostly Javanese and a mix of Australian and European ex-patriots, the island moves through an unprecedented amount of
garbage every year. At the beginning of the rainy season, tidal waves of trash hit Bali’s popular beaches. Surfers swim among plastic bags, sunning tourists step over bottles and cans. The mayor of Bali has written this issue off as a “natural phenomenon.” An estimated 5000 tons of solid waste is illegally dumped on the island each day in gullies, streams, rivers and estuaries. Without working knowledge on how to deal with these materials, many locals end up burning the refuse. Smoke billows up from ditches on the side of the road, the smell of burning plastic common at every mile. According to the EPA, burning garbage has both environmental and health impacts. It produces harmful quantities of dioxins, a group of highly toxic chemicals that settle on crops and in waterways, ultimately ending up in the local food. Burning trash can also increase the risk of heart disease, aggravate respiratory ailments such as asthma and emphysema, and cause rashes, nausea, or headaches. Some local organizations based in Bali are working to introduce recycling programs and develop the educational base needed to change waste management practices. Without the proper infrastructure, however, sustainable habits are difficult to encourage. In the United States, many municipalities are introducing solar-powered trash compactors, manufactured by Massachusetts-based BigBelly. These units have found homes in all fifty states and have distributors all over the world. They reduce trash collections by up to 80%. The compaction mechanism in these units is chain-driven, using no hydraulic fluids. Maintenance is very low, usually consisting of lubricating the front door lock once annually. They run on a standard 12 volt battery, which is kept charged by the solar panel. They can be embedded with wireless technology to report their status to a local waste management entity. If installed in locales with similar dynamics as Bali, i.e. communities with a consistent flow of tourists and minimal local knowledge of waste management, these compactors have the potential to have a significant impact on the local environment. This presentation will focus on the relevant social and anthropological themes in connection to waste management in Bali and similarly situated economies, and will assess the viability of installing solar-powered compactors by analyzing strategic placing and community integration.

**Linares, Carlos**
Adjunct Instructor, Environment and Development, Global Human Development Program, Edmund A. Walsh School of Foreign Service, Georgetown University, United States, linaresc@aol.com

"Affordable Housing without Subsidies Can’t Wait"

Goal 11 of the Open Working Group Proposal for Sustainable Development Goals “make cities and human settlements inclusive, safe, resilient and sustainable” and its corresponding target 11.1 “by 2030, ensure access for all
to adequate, safe and affordable housing...” can be achieved without subsidies.

The paper to be prepared and the oral presentation to be delivered at the conference will focus on slums, regulations, subsidies and affordability.

The search for affordable housing is not new. One billion people – 32 per cent of the world’s urban population – live in slums. The growth of slum populations in developing countries (estimated to increase over the next 30 years to about 2 billion), calls for a renewed search for balance between what is deemed adequate and what is affordable housing. There is one tool that can demonstrate the relationship between adequate and affordable.

The application of the Bertaud Affordability Model demonstrates how anti-poor standards and regulations – conceived to ensure a miss-conceived notion of adequate housing – become a key constraint for the supply of affordable housing; and one of the reasons why poor households find in slums the only feasible option for shelter. The application of the Model demonstrates that pro-poor policies and regulations – reduced standards and flexible regulations that lower development costs – can provide housing options the poor can afford, are legal, and eliminate the need for unsustainable subsidies.

The paper will include examples of the Model’s application; and the oral presentation will demonstrate how the Model works in practice via slide show. These will prove that the Bertaud Affordability Model is a simple, user-friendly tool (in the public domain) that housing planners can apply to find efficient land use options affordable to different income segments of the population. By linking development norms and standards (that mandate minimum lot sizes, built up areas, set-backs, street widths...) with development costs, financial conditions, and the percentage of beneficiary incomes dedicated to monthly payments; the Model can – via an unlimited number of iterations – demonstrate the benefits of adopting more flexible and realistic standards that lower housing development costs and meet affordability objectives. The Model can inform decisions in determining the most feasible housing solutions the poor can afford.

A renewal in the housing sector will require political will. The world’s poor will need that political will for the next 15 years. And it is helpful that governments and international financial institutions already know that money for subsidies is always limited and subsidies unsustainable. Allowing for change and implementing innovations will be an important benchmark in the process of building good local governance on the way to 2030 – an implicit statement for the achievement of Goal No.11 of the proposed SDGs.
This submission is based on the World Bank’s publication “Efficiency in Land Use and Infrastructure Design: An Application of the Bertaud Model” by Alain Bertaud, Marie-Agnes Bertaud and James Wright, Jr. (May 1988), and on many years of experience by the author applying the Model in several developing countries.

Mascareñas, David
Technical Staff Member, Los Alamos National Laboratory, United States, dmascarenas@lanl.gov

"Potential Structural Health Monitoring Tools to Mitigate Corruption in the Construction Industry Associated with Rapid Urbanization"

Significant investments have been made in infrastructure health monitoring research over the course of the last two decades. In the United States and Western Europe this research has primarily been motivated by the need to monitor the state of aging infrastructure. One issue with this philosophy is that it completely ignores the infrastructure health monitoring challenges associated with the developing world where the majority of urbanization is expected to occur over the next 35 years. The UN projects that 2.5 billion additional people will live in cities by 2050, and 90% of the increase will occur in Asia and Africa. 37% of this growth is expected to occur in India, China and Nigeria. The infrastructure development challenges in these countries are significantly different than those encountered in the United States and Western Europe. For one, these countries suffer from high levels of corruption. The result is that cities in these regions can contain tens of thousands of illegally and poorly constructed buildings erected by unscrupulous contractors. In many cases contractors have used substandard construction practices such as not adequately washing aggregate before placing it in concrete, or substituting bamboo for rebar in concrete, or filling concrete with refuse in place of aggregate. Structures often collapse during construction, shortly after being in service, or in the face of severe weather and natural disasters. In other cases significant loss of life has occurred when unscrupulous business owners have compelled employees to perform work in structures known to be unsafe and being used for unintended activities. This was the case with the 8-story Rana Plaza garment-factory collapse in Bangladesh in 2013.

The work has generally followed the paradigm of instrumenting a structure with a wireless sensor network, collecting data from the structure and then applying statistical classification techniques to infer the presence and characteristics of damage in the structure. The wireless sensor network-based paradigm of infrastructure health monitoring for instance, has many challenges including supplying energy to sensor nodes, communication bandwidth, and the high-costs associated with installation. These problems
are only going to be exacerbated when proposing infrastructure management solutions for the developing world. Furthermore, it is doubtful the energy challenge associated with long-term deployment of these measurement systems will be solved by new battery technology or energy harvesting on the timescale associated with rapid urbanization. If the infrastructure health monitoring community is going to have a global impact we need to invest in research that facilitates monitoring and construction verification in an agile, low-cost fashion that goes beyond the individual structure scale to the city-scale. This work will present a number of novel, cross-disciplinary approaches to the infrastructure health monitoring problem we are currently exploring, including imager-based techniques for structural assessment on the city scale, taking aerial robotic structural inspection beyond imaging, remotely-readable tamper-evident seals, and haptic interfaces for infrastructure monitoring. The goal of this work is introduce the sustainable development community to the research done by the structural health monitoring community that may help reduce corruption encountered during development activities.

McDonnell, Leah  
MDP Candidate, University of Winnipeg, Canada, mcdonnell-l@webmail.uwinnipeg.ca

"Feeding the community: the food center model in urban areas"

Food security in urban areas has become a major topic of concern and affects those of lower-economic status most severely. Food security is understood as the access that members or communities have to foods in order to meet dietary requirements (Pinstrup-Andersen, 2009). However, the idea of food security has evolved to include the type of foods that people are consuming. In dense urban areas of lower-economic standings, it has become more common for food deserts, or the lack affordable nutritious foods, to appear (Cummins, 2002). With the known negative health comes related to lack of access to healthy and nutritious foods, food security is a topic that must be addressed in these urban areas. In Winnipeg, Canada, those most at risk of food security tend to be racialized and marginalized groups (Indigenous peoples, newcomers, immigrants and refugees). The NorWest Community Food Centre (NorWest) is a community-based food cooperative that uses a food center model, as opposed to a food bank model, to address issues of food security in the largest Manitoba Housing community in the province. The model tackles issues of local and immediate food insecurity by providing free foods to community members, while simultaneously addressing larger issues of food security and social inequality by offering advocacy services and programs. As the center has only opened its doors in February 06, 2015, it provides a strong case-study example of how to operate a sustainable community food center in a low-income and developmentally stunted area.
This dynamic model differs significantly from a food bank model, which tends to provide band-aid solutions for protracted issues. NorWest operates as a community center that offers access to clean, nutritious foods, a community garden, cooking classes, advocacy and outreach programs and much more. It functions both as a service provider and as a community safe space. NorWest’s model addresses both the immediate problems posed by food insecurity and the broader context of social injustice by training local advocates to act on behalf of the community and help members within the community.

As this food center model is adaptive and bases its programming on needs of the community, the garden is currently in the early stages of creating a traditional medicine garden for the cultural practices and needs of its First Nations, Inuit and Metis members (and will be open for any community members who would like to access it). NorWest also offers a farmer’s market to community members by buying foods in bulk and then sells produce back to the community at cost, allowing members who are at a lower socio-economic level the opportunity to purchase healthy, wholesome foods that would not be affordable otherwise.

This model uses evidenced-based solutions to deal with issues of food security in the Inkster neighborhood in Winnipeg that tailors programming to the needs of community members.


Simões, Marco; Eduarda La Rocque
Executive Director, SDSN Brazil, Brazil, jss.ipprio@gmail.com

"Pacto do Rio, for an integrated city: Promoting, monitoring and accelerating Rio de Janeiro’s sustainable urban development"

The success of efforts to reduce inequality and improve public services hinges on the cooperation between different sectors of society. This is one of the core theses of the Third Way, the normative political theory which inspired the programs carried out by several center-left governments. In the 1990’s, proponents of the Third Way in the United States, the United Kingdom and the Neue Mitte (new center) in Germany sought to reconcile two principles: neoliberal economic efficiency, and central social justice principles from social democracy (Blair & Schroeder, 1998). Advocates of the
Third Way argued against excessive expansion of the Government and in favor of strong private participation in strategies for reducing inequality, emphasizing the use of public-private partnerships (PPPs) as an important tool for increasing access to public services. Third Way advocates also emphasized the central roles of education and workforce qualification in their political programs. In several countries, including Sweden, the Netherlands, and France, governors implemented policies which can be seen as closely related to the Third Way, such as rigorous fiscal policies combined with State intervention to avoid unemployment (Barrientos & Powell, 2004). The Third Way also had considerable effects in Brazil (Bresser-Pereira, 2001).

The social justice principle in Third Way theory makes inequality and poverty reduction a political objective. In Brazil, there have been considerable advances in relation to this objective. Public data from Instituto de Pesquisa Econômica Aplicada (IPEA), shows that the number of people in extreme poverty in Brazil fell from 26.6 million in 2003 to a little less than 10 million in 2012, taking the extreme poverty rate from 15.2 per cent to 5.3 per cent of the population. In the same period, the poverty rate fell from 35.7 per cent to 15.9 per cent. Rocha (2013) proposes three drivers for this change and the improvement in the standards of living in Brazil: the dynamisation of the labor market, the policy to increase the minimum wage, and the conditional cash transfer programs.

Despite poverty reduction, income inequality remains a significant problem to Brazil and the world (Piketty, 2014). Although there is broad consensus on the risks of inequality, not all types of inequality deserve the same degree of State attention. The economic outcomes of citizens and their capacity to respond to financial crises are substantially influenced by inherited conditions such as their parents’ income and the characteristics of the community where they grew up, as well as the influence of individual effort and dedication. There is an important philosophical school that identifies equality of opportunity as a main political goal, rather than equality of income or welfare (Roemer & Trannoy, 2013). Besides social justice, the Third Way promotes the economic efficiency principle, considering classical socio-democratic policies for inequality reduction counterproductive, as they tend to provoke large fiscal deficits. The Third Way proposes inequality reduction by means of education and incentives for job creation and professional development, without risking fiscal stability (Reich, 2001). Many Third Way proponents mention the importance of good governance and intersectoral cooperation, without recognizing the enormous size of this challenge.
Health

Amud, Rhamilly
Health Programme coordinator, Amazonas Sustainable Foundation, Brazil,
rhamilly.amud@fas-amazonas.org

"Early Childhood Development Strategy for Forest Riverine Communities"

The project ‘Riverine Early Childhood’ (PIR in Portuguese) is a joint initiative of Amazonas Sustainable Foundation (FAS), the State Department of Health Amazon (SUSAM) and the Institute for the Development of Social Investment (IDIS) that aims at fostering early childhood development of children living in riverine communities along the Amazon Rivers.

The strategy is enabling a fruitful environment for childhood development by applying a service model based on home visits provided by local health agents. This service model has a holistic approach to the child wellbeing and covers issues such as health, nutrition, home accidents, psychological stimulation and the importance of playing. In addition, this model is properly adapted to local particularities.

The project also has a component of engaging local leaders to support community health agents as a strategy to involve these agents (reducing their turnover rate) and then facilitating their access to houses for several reasons. In order to compare and assess project’s effectiveness, it was carried out a baseline study that indicate (i) most of the agents knew or comprehend less than 50% of the public policies related to early childhood, (ii) and the less than 50% of the parents used to interact and play with their sons and daughter on a regular basis.

In 2012-2013, the pilot phase was implemented in 18 communities, at the Rio Negro Sustainable Development Reserve, with 250 children, 38 pregnant women, 16 community health agents, and 3 local supervisors.

Initial results indicate that a high rate of acceptance of the model by both the agents and families. Majority of the agents (75%) were able to fully implement their visit schedule and perform the proposed activity with the family just after the training. Vast majority of the families (90%) evaluated visits and homecare provided as ‘excellent’ or ‘good’ after the first year. The maternal mortality was decreased close to zero and infant mortality was reduced in 66%. There was also a significant reduction on diarrhea and an expressive increase in immunization.
The stimulation component is also indicating good results. In 2012, none of the families had the routine of reading or telling tales to their children. Nowadays one third of families do it on regular basis.

The results indicate that it is possible to implement a cost effective early childhood policy for low demographic density and isolated areas, such as within the Amazon. Moreover, local community health agents are an efficient stakeholder to implement such model.

**Breghi, Gianluca; Rino Rappuoli, James Kenneth Timmis**
Managing Director, Fondazione Achille Sclavo, Italy, breghi@sclavo.org

"Maximizing The Contribution Of Vaccination To The SDGs And The Grand Convergence - Integrating Multi Criteria Decision Analysis With The Broader Benefits Of Vaccination To Align On Sustainable Immunization Strategies"

Vaccines play a key role in global health and development, but their broader value is still today highly underestimated. This paper focuses on the *broad benefits of vaccination* and how pragmatic, evidence-based, multifactorial assessment methods will release the full support of vaccination to achieve the Sustainable Development Goals (SDGs).

Vaccination is the most successful and cost-effective medical intervention ever introduced, saving between 2.5 and 3 million lives every year and preventing countless illnesses heavily impacting individuals, their families and communities, and consequentially hampering development of societies at large. Vaccines have significantly contributed to the dramatic decline in mortality rates witnessed over the past decades, crucially supporting achievement of the Millennium Development Goals.

The success vaccines had in the past decades created a certain level of complacency. The value they currently provide is still far behind the significantly greater potential benefits they can offer. Even today the success of vaccination coverage is measured using only the DTP3 indicator while using all of the 11 vaccines recommended by WHO would be much more appropriate. Without more comprehensive future vaccination strategies the SDGs and the Grand Convergence in Health 2035 will not be achieved.

It is of paramount importance to fully exploit the broad benefits vaccination provides to six of the fourteen targets of SDG no. 3, (*Ensure healthy lives and promote well-being at all ages*), but also to at least six other SDGs and the Grand Convergence in Health over the next 20 years.

In the 20th century, vaccination was used as a public health tool in western countries leading to the near eradication of many infectious diseases (IDs)
and consequently facilitating economic development. Over the past decades health economic analysis has become the preferred method to compare cost and benefit of health interventions, and prioritize them. However, neither indirect costs, e.g. time losses for patients, carers and employers due to illness, nor benefits not immediately associated with health outcomes, such as societal benefits, that are consequent to the use of vaccines are currently captured by HEA. Additionally, important multiplier and network effects, e.g. protection of others and at-risk groups, prevention of epidemics and pandemics, and long-term economic benefits for communities plagued by disease and poverty, are not adequately taken into consideration. We argue that HEA should not be used as the only criterion, and consequently should be considered alongside a broader array of criteria to capture more accurately the full benefits of vaccination. Scientific evidence suggests that Multi-Criteria-Decision-Analysis (MCDA) is a method particularly well suited to systematically take into account the many variables needed to capture the broad benefits of vaccination. Additionally, we claim that our research has identified attributes central to vaccine evaluation potentially representing best practice guidelines.

If our goal is to reduce the burden of diseases and facilitate sustainable development, vaccines need to become a top priority on the global health agenda. Without fully capitalizing on the broad benefits of vaccination we will not succeed in achieving several SDGs and the Grand Convergence in Health in 2035.

**Javed, Sajid; Waqas Imran, Huma Dad Khan**
Research Fellow, Sustainable Development Policy Institute (SDPI), Pakistan, sajidamin@sdpi.org

"Social Inequalities in Health Care: Evidence from Pakistan"

Socioeconomic status grounded inequalities in access to and use of health services has earned a consensus the world over and emerged as an active area of research. Particularly the concerns are higher in developing countries facing the resource constraints at one hand while the social and/or spatial clustering of available health services on the other. This paper, using data from available all three rounds of Pakistan Demographic and Health Survey (PDHS) (1990-91, 2006-07 and 2012-13), proposes measuring the (in)equitable distribution maternal and Child health care with a particular focus on distribution of available health facilities across the socioeconomic position of the household using concentration index (CI), concentration curve (CC) and capability theory framework (CT). Setting PDHS (1990-91) as the base line scenario, the progress in the distribution of health services will also be provided. The analysis will be controlled for other contextual factors affecting the outcome. The findings of study are of significant policy
importance in the light of ongoing decentralization in Pakistan and serve as an appraisal of the outcome of devolution of health policy to provinces in 2010 after 18th constitutional amendment. Significant implications can be drawn for public health policy of the country in the context of decentralization.

Kahan, Tyrell  
Student, Emory University, United States, kahant@gmail.com

"Analysis of zoonotic pathogen presence among humans, mountain gorillas, and the environment in Bisate, Rwanda"

With the continued expansion of the global human population, the interactions between humans and gorillas are increasing. As a consequence, gorilla habitats are reducing in size and the potential of exposure to zoonotic pathogens are on the rise. Rwanda, in particular, is an ideal ecosystem to explore the consequences of this interaction because of the increasingly large, dense, poverty-stricken population that lives in close proximity to a group of endangered mountain gorillas. In partnership with the Dian Fossey Gorilla Fund International (DFGFI) and the Emory Global Health Initiatives, a deworming impact assessment will be conducted on primary school children (6-13 years old) in the Bisate catchment area in Rwanda. The impact assessment will include a fecal parasite survey, the collection of anthropometric data, and a survey to assess infection risk and morbidity related to enteric pathogen infections. About 40% or 800 children will be included in the impact assessment. We will also explore environmental routes of exposure by measuring soil contamination, analyzing fecal samples for the presence of pathogenic protozoa and bacteria, and integrating an educational component on water, sanitation and hygiene to advocate for a comprehensive understanding and treatment of enteric pathogen infections. This community closely borders the Volcanoes National Park, where more than half of the remaining mountain gorillas (approximately 480) in the world can be found. Human and mountain gorilla samples will be screened molecularly to determine if cross-infection of enteric pathogens is occurring. The assessment of the presence of enteric pathogens, especially those of anthropogenic interest, in the Bisate community will be incredibly valuable to the conservation efforts of the critically endangered mountain gorilla population and the poverty-stricken human population in this region.
McClure, Max; Catherine Machalaba, Carlos Zambrana-Torrello, William B. Karesh, Peter Daszak
Medical Student, Columbia University College of Physicians and Surgeons; EcoHealth Alliance, United States, mam2477@columbia.edu

"Land Use Allocation: A Framework for Considering Health- Relevant Outcomes"

In a world of finite surface area, the need to increase agricultural production (FAO 2012) inevitably clashes with our responsibility to preserve the globe’s intact ecosystems. How the remaining land may be optimally allocated is a pressing question, with inadequate representation of either land use type leading to potentially severe consequences for human health and wellbeing.

Current reserve design tends to approach this question via one of two strategies: by optimizing a given objective in the face of a constraint (e.g.: maximizing the number of species that may be included in a reserve of a given size), which maintains a bright line between the goals of development and conservation (Polasky et al. 2008); or by maximizing the summed economic productivity of both the agricultural matrix and the ecosystem services provided by reserve land, thereby evaluating both land use types with a common currency (Chan et al. 2006). What is arguably a core benefit for optimization for the public, however, is health: the promise of health offered by a local food supply and thriving economy, balanced against the health-related ecosystem services provided by wild nature. Yet long-term, comprehensive evaluations of human health effects are not explicit in most analyses of land use tradeoffs, even for projects that undergo otherwise stringent environmental and social impact assessments.

Building on the work of the Future Earth ecoHEALTH project we propose, as an adjunct to existing strategies, using projected human health outcomes as a common currency in integrative assessments of land use tradeoffs. In addition to its inherent worthiness as a policy objective and its tangibility to the public, health promises to be a holistic and sensitive readout of land use management strategies, as Initial data suggests that there are health consequences to both the composition and configuration of land use patches. With this in mind, we describe a framework for land use allocation that focuses on health-relevant factors.

The most straightforward assessment category consists of factors drawn directly from a standard ecosystem services analysis, in which calculated economic benefits or costs are translated into expected health outcomes. More complex are those factors that have health-specific effects and are consequently overlooked by standard environmental assessments. Additionally, the sociopolitical costs and consequences of mandating and enforcing a given land allocation strategy should be considered. Using this...
framework, the solution to a given reserve design problem would be to optimize expected human health outcomes.


**Olaniyan, Oluwabusola**
Student, University of Winnipeg, Canada, asafaolaniyan-o@webmail.uwinnipeg.ca

"Policy paper towards achieving health equity and sustainable development in the indigenous context"

Indigenous peoples remain on the margins of society: they are poorer, less educated, die at a younger age, are much more likely to commit suicide, and are generally in worse health than the rest of the population (Alderete & World Health Organization, 1999). The world is made up of approximately 400 million indigenous people and they constitute about 6% percent of the global population (First Peoples Worldwide, 1997). Despite worldwide improvements in health services for the underprivileged, the health status of indigenous peoples continues to vary significantly from that of non-indigenous population groups. They account for a disproportionately large share of the poor, and are among the most marginalized inhabitants of every nation they inhabit (Hall and Patrinos, 2012) 1. Health inequities can be eradicated between groups of peoples and between the indigenous and non-indigenous peoples across the globe through policy targeted approach. After all, inequities are products of inequalities within and between societies.

The Sustainable development Goals (SDGs) that succeeds the Millennium Development Goals (MDGs) focuses on the challenges of ensuring more equitable development and environmental sustainability. Sustainable development outcomes could be marred by health inequity between the indigenous and non-indigenous peoples globally and consequently reflect unfair social policies or practices. The globe has witnessed tremendous health improvement and the health status of peoples found around the world has not diminished. However, there is a growing health disparity between the indigenous and non-indigenous peoples; and the impacts of this disparity are of grave concerns from both the public health and human rights perspectives. Furthermore, health inequity has strong negative impact on sustainable indigenous development, thus perpetuating the vicious cycle of poverty, and growing disparity between indigenous and non-indigenous peoples.

This paper is a contribution towards achieving health equity and sustainable development in the indigenous context. It reviews some of the recent
literatures of the structural drivers of the underlying factors of health inequity as well as the devastating burden of some forms of diseases. It also identifies the need to reinforce policy approach towards achieving health equity and sustainable development by thinking more broadly and working across sectors to develop healthy public policy. Some identified policies during secondary research emphasized the right to health and the accessibility of health within the non-indigenous populace. The overarching policy should target indigenous and non-indigenous populations, rather than focusing on health inequality between the majority population. In addition, a single effective policy from the combination of the existing ones could also make a lasting impact towards achieving health equity and sustainable development in the indigenous context.

Bibliography

Perumal, Subashini
Research Associate to Executive Director, International Initiative for Impact Evaluation (3ie), India, sperumal@3ieimpact.org

"Breaking through stagnation - testing innovative approaches to engaging communities in increasing immunisation coverage: A scoping study"

Substantial progress has been made in improving routine immunisation coverage across the world. However, it is also clear that a problem of low or stagnating immunisation coverage remains in low and middle-income countries. Health and sustainable development are interconnected, with immunisation programmes being essential to measures of preventative care. There is an increasing realisation that inclusive solutions must involve communities playing a prominent role in the planning and delivery of services. This scoping study examines community engagement as a practical solution to increasing immunisation coverage and improving access to and uptake of vaccinations. The authors review current involvement of communities in immunisation programmes and possible ways to enhance participation. Additionally, innovative community engagement approaches in development sectors outside of immunisation are identified, such as Community Led Total Sanitation and Farmer Field Schools. Such processes
are closely examined in terms of community engagement; what the key lessons learned are; and whether the main features characterising each model may be transferable to immunisation. Through theory of change analyses, these profiles highlight inputs, outputs, outcomes and assumptions before determining their applicability to immunisation.

Four instruments were used to cover the scope of the study: (a) A rapid evidence gap map, which identifies and displays existing studies according to what intervention is evaluated and what outcomes are measured; (b) a survey of key stakeholders, including implementers and researchers in the field of immunisation; (c) semi-structured interviews with key experts in immunisation on the opportunities in and challenges to increasing immunisation coverage through community engagement; and (d) evidence profiles that discuss community engagement initiatives in other development sectors.

Analyses point to the potential key role that communities can and should play in almost all aspects of the causal chain for programmes aiming to increase immunisation coverage. Such engagement should be initiated at multiple levels, including communication, demand generation, service utilisation, and monitoring and evaluation stages. While immunisation is included in many national health systems, customising the programme while taking into account important cultural and contextual influences can address the problem of reaching the last mile. Results indicate that communities can be most engaged in this area. Responses from expert interviews emphasize a need to ensure continuous and consistent engagement for (micro) planning; awareness creation; and monitoring and surveillance. Additionally, programmes co-managed with the community were demonstrated to be more likely to succeed than those lacking participatory approaches.

In conclusion, this report reveals that current evidence around community engagement in immunisation coverage interventions is insufficient. Specifically, this study highlights the crucial role of community involvement in developing participatory and innovative solutions to low immunisation coverage. Programmes that use participatory approaches should generate evidence in tandem to help pilot, plan, deliver and enhance learning.

**Rulong, Patrick**
Masters of Development Practice Student, University of Waterloo, United States,
rulong44@hotmail.com

"Transforming China’s Informal E-Waste Recycling Sector"

Population growth, higher standards of living, and an increasingly globalized economy are fueling global demand for electrical and electronic equipment.
As a consequence of such rapidly expanding consumption rates, each year there is more electrical and electronic waste (e-waste) produced than the previous year. In 2014, nearly 42 million tons of e-waste was discarded globally, as current UN projections predict 50 million tons of annual e-waste to be generated by 2017. Much of the e-waste from the developed world is shipped to various developing countries to be recycled, which often use primitive recycling techniques. According to the UNEP, 90% of the world’s e-waste is illegally dumped or traded each year with an estimated value of $19 billion USD. China appears to be the largest e-waste dumping site in the world, receiving shipments from the USA, Europe, and nearby Asian countries, including Japan and South Korea. Additionally, China’s domestic generation of e-waste is increasing rapidly as per capita income rises and the Chinese government continues promotion of domestic consumption of various consumer goods.

Informal e-waste recycling in China is prevalent in areas with a considerable electronic manufacturing sector, as the informal recyclers are able to extract and provide useful components and materials for production. The two largest centers of e-waste recycling within China are Guiyu, Guangdong and Taizhou, Zhejiang. Most of the recycling laborers are rural migrants from distant agricultural regions who then take the exceptionally dangerous job of dismantling and processing e-waste. Many of these workers are women and children working for a mere pittance. Informal e-waste recycling involves labor intensive and often unsafe manual dismantling of equipment using simple hand tools such as hammers and chisels, along with highly pollutating practices such as open burning, melting, and acid stripping. These hazardous recycling practices lead to public health and environmental degradation concerns as air, soil, and water contamination are commonplace within informal e-waste recycling areas. Heavy metals, polybrominated diphenyl ethers (PBDEs), polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) are common pollutants emitted from informal recycling. Many of these pollutants are known carcinogens and also lead to a variety of negative health effects, which typically occur from ingestion of contaminated food and water, along with direct exposure during the dismantling process.

This paper will investigate various necessary environmental remediation measures at numerous e-waste recycling sites, in order to combat ongoing air, water, and soil pollution, which poses significant health risks to local residents. Furthermore, this paper will recommend stringent regulation on e-waste recycling practices to be enforced on the local, provincial, and central governmental levels, so that further pollution may be prevented. Also, suggestions will be made for a wide range of formal collection channels of e-waste, enhanced enforcement of policy targets for collectors and recyclers, and technologically advanced recycling methods when economically feasible.
von Qualen, Frieda
Candidate, Master of Development Practices in International Development,
University of Minnesota, United States, vonqu001@umn.edu

"Developing a Seamless Service Experience for Clients Accessing Health,
Economic, Education, and Social Services"

Collective impact at a community level is instrumental to addressing all the
components of health and well-being within a community. Multi-service
centers are one way to create and foster collective impact at a community
level; the centers can serve as a location where different sectors and service
providers can meet, work, and agree to solve a specific social problem using a
common agenda, aligning efforts, and using common measures of
success.[1] Through aligning efforts, multi-service centers are able to
provide multiple types of services to diverse populations in terms of socio-
economic status, age, cultural background, and gender. To understand best
practices for multi-service centers serving diverse populations, our team
interviewed 10 multi-service centers’ program- and executive-directors
across the United States about how they operate their centers, what they
perceive as essential to the success of their center, and what they would
recommend other multi-service centers take into consideration. These
interviews highlighted 11 key components any center providing multiple
services should include in their strategic planning processes so they develop
a multi-service center that meets the needs of clients, staff, and service-
providers. These components range from setting up memoranda of
understanding and establishing regular communication amongst staff
members to creating center-wide safety protocols and celebrating
successes. This paper is not meant to be a step-by-step guide of how to start
a multi-service center, but rather a list of high priority topics to consider
when developing a multi-service center that aims to ensure healthy lives and
promote well-being for all people in a community.

Inclusive Economic Growth / The Role of Business

Chan Gomez, Irving; Victoria Chuong, Matthew Anderson, Rachel Stanton
Masters in sustainable Development Practice Candidates (University of Florida, Emory University and Columbia University), University of Florida, United States, irving.changz@ufl.edu

"Engaging distant areas and beyond: assessing the internal integration of the PROSPER sustainability strategy within Bavaria S.A."

Recently, it has become clear that the development of communities at all levels involves different stakeholders from several sectors: civil society, governmental, nongovernmental, and corporations. Thus, to what extent does a corporation play a role in society is an important and relevant question. Shared value and corporate social responsibility are becoming major strategies in which corporations realize and act towards a triple bottom line: profitable, socially responsible and environmentally friendly. With efforts directed towards this triple bottom line, corporations have the potential to become major actors for better sustainability practices.

SAB Miller, the second largest multinational brewing company in the world, has recently launched its new sustainability strategy: PROSPER, consisting of five shared axes: a prosperous, strong, social, clean and sustainable world (SAB Miller). SAB Miller operations in Colombia account for the largest in Latin America. Since the five shared axes are defined broadly to facilitate adaptation to the local context, the fulfillment of the PROSPER objectives in Colombia, and presumably in other countries, involves a greater effort for cross-sector collaboration between the company, partners and involved stakeholders (SABMiller). However, as a result, some areas of the value chain have not fully identified their role in this corporate endeavor and the impact of their efforts to the achievement of these sustainability goals. Therefore, a unifying effort is required in order to identify the relationship that each area has within the company to accomplish shared goals, and the greater impact their communities.

For ten weeks this summer, in collaboration with the corporate social responsibility department, four Masters in Development Practice (MDP) Candidates: Matthew Anderson and Irving Xchel Chan Gomez from the University of Florida, Victoria Chuong from Emory University, and Rachel Stanton from Columbia University will be conducting qualitative research to assess the level in which SAB Miller employees of selected operations in Bogota, Colombia take ownership of the PROSPER strategy and how they see reaching sustainability goals as important to themselves beyond what the company aspires to.
After understanding the target goal of the particular area of the company and creating a baseline of employee participation and ownership, the MDP team will identify and prioritize the targets that the company and employees see as most important and to what is achievable and measurable. This might also mean analyzing which aspect of the operation needs closer monitoring, what group of employees need further developing, analyzing employees’ incentives, their capacity, and how that might be influenced by SAB Miller’s dedication and commitment to these goals. Subsequently, a strategy will be devised in order to engage the employees, and increase and maintain ownership at the individual level. It is expected that each employee will have a different understanding and reaction to sustainability but once common trends are understood and identified, the MDP team will be able to put together a plan to scale up the strategy while devising a monitoring and evaluation instrument that will inform the company of progress and performance improvement. Results are expected to be available by early August.

Dilyard, John
Associate Professor, St. Francis College, United States, jdilyard@sfc.edu

"The Role of the MNE in Inclusive Economic Growth"

The role of multinational enterprises (MNEs) in the economic development of developing countries has long been, the topic of international business research. As the millennium development goals (MDGs) have evolved into sustainable development goals, there has been a renewed focus on sustainable development and the successes and failures of the of the MDGs. Increasingly, there has been discussion of the role of MNEs in the context of development, particularly on the extent to which they are aligned with a host country’s development agenda. As the focus in the global development community has turned from just economic development to sustainable economic development, and considering that sustainable development will soon be defined by a broad, consensus-built set of sustainable development goals, this role continues to be both of interest and important.

This presentation will be a comprehensive examination of the ability of (primarily, but limited exclusively to) Western MNEs to help developing countries attain socially inclusive and sustainable economic growth. Because the literature on the relationship between foreign direct investment (FDI) and economic development has generated rather inconclusive results, this presentation will not focus on FDI. Rather, it will address how an MNE’s operations in the pursuit of its own profitability and competitiveness perhaps can be the best mechanisms to promote sustainable economic growth in developing countries. Such elements as capacity building, supply chain management, knowledge transfer, and coalition building (between firm
and host country sectors) are all part of this discussion. An underlying premise in the discussion is that the relationship between an MNE and its host country should be one built on collaboration in which both parties both see and embrace the idea that pursuing socially inclusive and sustainable development (in line with the UN’s sustainable development goals) benefits both. In other words, the relationship between the MNE and its host country is not a series of arm’s length transactions defined by the self-interest of the respective parties, but a form of partnership in which each party has a vested interest in the economic health of the other. That this ‘economic health’ with regard to the host country is consistent with the overarching UN sustainable development goals also is understood by all parties.

Because it is impossible to ignore that the MNE-host country relationship is affected by governance structures in the MNE, the MNE’s home country, and the host country, this presentation also will include a critical review of the various systems of governance that influence the interactions between an MNE and its host country. These systems include national and international regulatory institutions, public and private governance systems, and the partners and relationships among MNEs, governments, and NGOs. The question about what kind of governance structure can best encourage, support and implement inclusive economic growth therefore will be asked.

Fawcett, Emma
Doctoral Candidate, American University, United States, emma.fawcett@american.edu

"Inclusive Growth through Mass Tourism: Lessons Learned in Punta Cana"

This paper outlines possibilities for achieving Goal 8 (promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all) through the mass tourism sector, while also accomplishing related objectives in infrastructure (Goal 9), poverty reduction (Goal 1), urban development (Goal 11), and water and sanitation management (Goal 6). While the proposed solutions are intended to have broad applicability, the paper focuses on a case study of Punta Cana, Dominican Republic. I begin by tracing Punta Cana’s development, the relationship between the public sector, private sector, and local residents, and its persistent development challenges. I then provide a series of national-level policy recommendations, designed to extend the pro-poor tourism discourse from community-based tourism to mass tourism.

While Punta Cana consisted of a handful of small hotels in the 1970s, today it is the Caribbean’s leading tourism destination, drawing most of the Dominican Republic’s annual 5.1 million visitors with its stock of 60,000 hotel rooms. The destination’s growth was driven almost entirely by the
private sector; the lack of public investment in the Dominican Republic’s east and the dearth of zoning regulations means that hoteliers have provided their own utilities and built high-walled compounds that keep tourists in and locals off the beaches. With comparatively few free standing restaurants and other attractions, tourists have little reason to leave – and are warned against it because of “security concerns.” Most of Punta Cana’s dispersed worker settlements lack basic services (electricity, safe drinking water, waste management, medical clinics) resulting in an abysmal standard of living, and the migratory nature of these communities poses challenges for community organizing. The influx of Haitian workers – some of whom secure better-paid hotel jobs because of their language skills – creates additional social tensions.

I assert that strong public-private partnerships and participatory approaches are of critical importance for inclusive growth through tourism. When local populations are disenfranchised and/or disorganized, getting the private sector to see inclusive growth as critical to its own strategic interests is essential for communities to obtain marked improvements in development outcomes. Recommendations to begin remedying these complex challenges include: 1) expand successful models of sustainability and participation provided by Dominican hoteliers, including Grupo Puntacana’s Ecological Foundation and other social programming; 2) ensure public-private partnership on the development of touristic corridors, which will increase tourist spending, increase visit lengths, and force improvements in basic services and infrastructure within local communities; and 3) encourage nongovernmental organizations already present elsewhere in the Dominican Republic to expand their activities to the east coast, where the dearth of civil society actors exacerbates existing development challenges.

Hamid, Babalisk
Student, University of Waterloo, Canada, b.hamid90@gmail.com

"Gender and Economic Development in Ghana"

Women and youth are among the poorest demographic populations in the world. Pre-existing gender roles and inequalities such as under representation of women in the economic sectors of many developing countries continues to marginalize these groups. Women lack access property rights, economic decision making and often participate in the unorganized sector in many developing countries. Lack of necessary training and skills plays a significant role in limitations for employment. Women are also subject to the global gender pay gap of 22 percent and are the often the first to loose their jobs. The goal of this research paper is to determine economic opportunities through a market systems approach in Ghana and how or if women can participate in these activities. Currently construction and agriculture are among the top economic sectors in the country. The
research will be conducted in association with the Non-governmental organization World University Service Canada’s Uniterra 3 program. The research results obtained for this paper are hoped to provide an introduction to future research and development of the inclusion of women in industry related activities predominate dominated by men. Research will look to secondary and primary data (if possible to obtain) in regards to public and private industry as well as policies, to be able to determine avenues for women’s inclusion into the market system.

**Harding, Sandra; Dennis Trewin, Ann Penny, Mark Ziembicki**
Professor, Vice Chancellor & President, James Cook University, Australia, vc@jcu.edu.au

"The Tropics and the Post-2015 Development Agenda: lessons from the State of the Tropics"

For a variety of reasons, both imposed from the outside and born from within, development in the tropics has lagged behind the rest of the world. In many ways, this makes the tropics more vulnerable than other regions to the world’s grand contemporary challenges. Recognising the unique and shared characteristics of the tropics the landmark State of the Tropics 2014 Report provides the first in-depth, impartial assessment of the tropics as an environmental and geopolitical entity in its own right. Drawing on the expertise and diverse backgrounds of leading institutions across the region the report offers a new perspective for understanding the diversity of the tropical zone and the nature and implications of the rapid and variable rates of change nations and regions in the tropics are experiencing. The report demonstrates that tropical nations have made extraordinary progress across a broad range of development indicators in recent years. Indeed, economic growth in the region has accelerated in recent times while it has slowed in the rest of the world.

Despite significant strides forward, the region is at a critical juncture. There are increasing pressures on the environment, poverty remains rife in many regions, and many nations suffer from poor health, education outcomes and governance issues. Rapid population and economic growth mean that the region’s influence is set to rise dramatically. The nature of the region’s growing influence, and its global implications, will depend on how it addresses its many challenges, and whether it realises its potential and opportunities. At a time of great global change, and as the world is set to redefine the global development agenda, it is timely to consider a new geopolitic – one that recognises the critical importance of the tropics and its key role in the global future.
In this paper we outline the State of the Tropics as a foundation for examining the complex interplay between the various social, economic and environmental factors that ultimately determine human wellbeing, prosperity and the integrity of natural systems in the tropics. We frame this discussion in light of the UN’s post-2015 Development Agenda and implementation of its Sustainable Development Goals, and conclude with an examination of the role of emergent opportunities, including new technologies and social changes, and their role in driving a sustainable and prosperous future for the tropics and beyond.

Méndez, Diana  
Executive Director, Responde, Peru, dmendez@responde.pe

"Infrastructure for citizenship"

In the last 20 years Peru’s economy registered a cumulative growth of 187.2%. Nevertheless, in order to transform this growth into sustainable development, the country has to tackle challenges such as the reduction of the infrastructure gap, which is estimated in $88 billion.

As it is widely known, the deployment of infrastructure contributes to improve the productivity and competitiveness of the country, to accelerate the reduction of poverty and to give access to a better quality of life for the most vulnerable population. In this scenario, the Peruvian government worked out different means to stimulate private investment and improve the quality of public expenditures. Specialized literature on the topic point out some suggestions to enhance the roll-out of infrastructure: to boost public-private partnerships (PPPs), to maximize project formulations, to prioritize the types of infrastructure to outlay, etc.

While these initiatives could increase investments in infrastructure, efforts are mainly focused on securing the offer but are not taking into account the demand, for instance, the next users of these infrastructures. Deploying roads, water and sanitation networks is not exactly synonymous with development. In Peru we have seen cases of basic infrastructure not being used, underappreciated or damaged by citizens who are not aware of the benefits it represents for them. These situations could be produced by the lack of education for use, the non – appropriation of the infrastructure and the lack of leadership and institutionalism, turning the infrastructure into white elephants.

The majority of infrastructure development projects focus only on the tangible aspects but do not involve a social management approach. This is needed to ensure proper deployment taking into account all the stakeholders implied in the process and to accompany users to acquire skills that make
them value the infrastructure, use it properly for their benefits, and look after it. Given the level of citizenship that exists in Peru, only accompanying users can improve citizen behavior and, therefore, lay the foundation for sustainable development.

Based on the experience and role of private companies that develop public infrastructure through PPPs, this document presents a proposal to deploy a social management strategy for water and sanitation infrastructure projects, focused on generating citizens who recognize the value and use the infrastructure for their benefits.

The focus on water and sanitation responds to the importance of that sector for Peruvian public policy, which is now working in increasing the networks and improve the management of the provision of the service. The challenge is big: only 6 out of 10 Peruvians access basic services in rural areas and the coverage in the country is 86%.

This model of social management, called "Infrastructure for Citizenship", puts citizens at the center of the process and promotes the appropriation of infrastructure as a means to achieve sustainable development. The stages that the model includes are: social mapping and relationship strategy with leaders, education and citizenship development, local government strengthening and the promotion of the use of infrastructure. As a result, users can become agents of their own development.

**Sampaio, Gabriela Passos; Maiara da Silva Gonçalves, Michelle Gonçalves Costa, Eduardo Costa Taveira, Virgílio Mauricio Viana, Marcelo de Castro Silva**

Technical Projects Coordinator, Amazonas Sustainable Foundation, Brazil, michelle.costa@fas-amazonas.org

"Technology innovation to açaí productive chain development at the Medio Juruá region, Amazonas, Brazil: main challenges and lessons learned"

The non-timber exploitation represents one of the main sources of economy in southeast area in the Amazon State, mostly at Juruá River, one of the most important and affluent of Amazonas.

Regional surveys indicate that açaí (*Euterpe precatoria* Mart.) is one of the main sources of income and food security, after fishery and family agriculture. The commercial interest for açaí fruit and its sub-products is growing and has a global demand, specially for being flexible species that can be used by food, cosmetics, automobiles, engineering, and even thermal energy generation industries. In Brazil, commercialization of frozen fruit pulp increased in a rate of 30%. Exportation to other countries are over a thousand tons per year.
At Médio Juruá region, big companies articulate local productive chains to get Amazon native raw products. In order to address this market demand the involved stakeholders has to increase the production and quality to boost regional production. However there are crucial bottlenecks related to the productive processes enhancement, i.e. rough and dangerous methods to collect fruits, storage and transportation conditions. These aspects decrease the price of such community-based products.

Amazonas Sustainable Foundation, Videolar, forest dwellers from Uacari Sustainable Development Reserve and the grassroots association, thus carry out a Research and Development (R&D) project that involved community-based açaí production. Within this project it was identified the need of a building capacity based on the assessment of traditional techniques and a participatory design of alternative approaches to increase production and quality.

More than 50 families were trained and their equipment were tested to enhance traditional practices in a positive way. Amongst researched proposals there is the development of new techniques of fruit collection – a non-safety practice as people climb the açaí tree without any equipment. It was also built beneficiation product unit aiming at developing local capacities in good practices of production and storage.

In addition this research had the co-creation of a community-based business model with the proposal of ongoing learning on açaí pulp production and commercialization. The mid-term goal of the project, in a sustainability strategy, is that graduated students from the Sustainable Production on Protected Areas course – held by Amazonas Sustainable Foundation and Technological Education Center of Amazonas – will lead such business model.

**Silva, Manuel**  
Expert in Public Relations and Sustainability, Telefonica del Peru, Peru, manuel.silvap@telefonica.com

"Fostering social entrepreneurship for development. The case of Kunan: innovation that creates value"

In 2014, Telefonica’s Global Millennial Survey pointed out that 82% of Peruvian millennials felt that the government didn’t do enough to foster and retain talent. This comes as a surprise and a warning for authorities after Peru was named the fifth economy with the highest levels of entrepreneurship in the world, according to the Global Entrepreneurship Monitor (GEM) last year.
The investment in innovation in Peru is considerably low compared with what’s made by the developed countries. This shows that most enterprises in the country (80% are microenterprises) are established as a means of subsistence and not to benefit from a new business model or opportunity identified. In addition, more than 60% of enterprises that are put in place close after a year.

In order to keep the entrepreneurship spirit alive and include an innovative approach, the government needs is to define new policies that promote competitiveness, which includes helping new ideas formalize, simplifying processes and promoting mentoring.

What about social entrepreneurship?

There are no exact numbers on social entrepreneurship in Peru since the concept is still getting noticed. Some incubators have emerged but there is still not enough information about the social ecosystem. There are even some cases of entrepreneurs that do not see themselves as “social”.

Since Yunus pointed it out, there is a clear link between social entrepreneurship and economic development policies. Social enterprises have shown to be strong change agents that develop and apply innovation to solve unmet social needs, especially those who represent some of the biggest challenges of the country and are not being attended by the government.

This document presents the case of Kunan (www.kunan.com.pe), Quechua word that means “now” or “present”, a platform to promote, integrate and inspire social entrepreneurship amongst youngsters in Peru. Kunan was released in 2014 by the initiative of Telefonica del Peru, a telecoms company, and the Global Shapers Lima hub. Its vision is to consolidate the social entrepreneurship ecosystem in the country and to do so it involves the public, private and third sector.

One of the most valuable propositions of Kunan is the formation of a community, which establishes a network of entrepreneurs who share knowledge, learnings and challenges and generate synergies to grow their own enterprises. This really adds value to an ecosystem in which there are still no clear paths to achieve growth and Kunan provides economic support, assessment, mentoring and dissemination in media, which comes as a great help to raise funds.

In a country where the fifth part of its population is still poor, fostering innovation to solve social challenges comes as a great help and could even impact on the definition of public policies regarding topics that have not been addressed by the government, such as web programming for women. In this
scenario, platforms that make visible the efforts of social entrepreneurs and provide them with tools to grow are necessary and need to engage with the public and private sector in order to accelerate and assure a sustainable development.

Sullivan, Kieran; Sebastian Thomas, Michele Rosano
Masters of Energy Studies Candidate, International Energy Centre, Australia, kieran.sullivan@outlook.com

"An Industrial-Ecology-Based View of the Firm"

The economic impacts of business activities have improved prosperity and living conditions around the world. At the same time, these commercial behaviors have resulted in environmental damage and social inequality, including the crossing of biophysical planetary boundaries, exploitation of developing economies, and widening of the wealth gap. As humanity moves further into the relative uncertainty of the Anthropocene, it is evident that existing strategic business management models are not able to effectively ensure equitable and responsible economic activity and promotion of the Sustainable Development Goals (SDGs). Arguably, the critical issue is how firms understand their place in a larger social and industrial ecosystem.

This paper presents a strategic business management conceptual framework integrating Hart’s “Natural-Resource-Based View of the Firm” (NRBV) and the principles of Industrial Ecology, creating an “Industrial-Ecology-Based View of the Firm” (IEBV). The paper examines the characteristics of business management models that have led to the current paradigm, and identifies types of commercial organization along the resulting spectrum of strategic practice. The paper then extends the NRBV model and articulates the IEBV framework, based around the simple idea of closing the loop, the benefits of industrial symbiosis, and holistic view of the world that comes from systems thinking.

Through examination of the concepts that underlie the IEBV framework, it is possible to identify key resources and dynamic capabilities that have the potential to provide businesses with a sustained competitive advantage whilst promoting inclusive and equitable sustainable development. The paper further examines IEBV framework through a systematic quantitative review of relevant literature and empirical data to determine the potential impact and effectiveness of the implementation of the IEBV framework to practical applications. By identifying ways in which businesses can achieve competitive advantage through activities that support the SDGs, the IEBV framework provides a pathway for innovative commercial organizations to contribute to a more equitable and sustainable future.
Tunde, Shaba
Research and Program Director, Bokma Foundation, Abuja, Nigeria,
tee_vee4live@yahoo.com

"Regional Intra-Africa Trade Development: Sustainable Development Policy Tools"

This paper on intra African trade development presents opportunities for sustainable growth and development in Africa. Consequently, seizing these opportunities requires private sector dynamism to be unlocked and a development based approach to integration to be adopted. The paper examines the historical trend of the intra Africa trade from the time of it independent to 2014 and also discuss look at the possible problem hindering intra Africa trade. The building of integration strategy is suggested to empower stakeholders in the economy, especially by strengthens the private sector to promote effective intra African trade. It was observed that lack of viable productive capacity is a major obstacle to expanding intra African trade and should be given considerable attention by African policymakers as to eliminating all trade and productive barriers in Africa trade. The paper also suggests specific novel policy and ideas on how to enhance intra Africa trade and its implementation for viable existing, restructure and new regional and national trade agreements with a view to boosting intra African trade for sustainable development among the continents. The study further, stresses on the need for an alternative approach to regional integration in Africa trade, outlines broad features of this new approach and how it could be applied in Africa. The new pathway calls for a move away from a linear model of integration, which lays undue emphasis on processes, into a more encompassing pragmatic and results oriented inter Africa trade pathway, integrating the regional and national development. Overall, the conceptual review underlines that the question of how Africa intra trade works has moved to the centre of development studies. Yet, an even bigger challenge in achieving developmental based integration agenda in the first place will be to go beyond trade liberalization to include broader economic and industrial policies aimed at addressing real economy capacity constraints, strengthening the domestic private sector and facilitating diversification and structural transformation for Africa to sustainable development.
Indigenous Communities and Sustainable Development

Dunbar-Ortiz, Rozanne  
Professor Emerita, California State University, USA, rdunbaro@pacbell.net

"Indigenous Knowledge the Key to Survival of Life"

Pre-colonial Indigenous Americans were able to support complex societies with extensive agriculture as well as building large cities and towns without degrading the environment. Indeed, the capitalist-driven invasion and destruction of these civilizations are now known to have triggered the onset of man-made climate change, which now threatens the destruction of all life on the planet. The colonial myth of a sparse population of Neolithic hunters and gatherers in Amazonia and North America has long masked the reality of the pre-colonial Western Hemisphere, in which the Indigenous Peoples had built economies and institutions that supported populations as large as Europe at the time, but without the motive of profit and accumulation of individual and corporate wealth. Capitalist accumulation and private property were not inevitable developments of human societies as the western idea of “progress” argues, nor is it possible to sustain that system. The necessary change will require more than sustainable development and an end to fossil fuel use; it will require a radically different relationship of human beings to one another and to the land.

Ero, Adesuwa V.; Oluwabusola Olaniyan, Barbara T. Gardner  
Students, University of Winnipeg, Canada, asafaolaniyan-o@webmail.uwinnipeg.ca

"A three layered model for preserving the cultural heritage of indigenous peoples"

According to Mililani Trask, the leader of the indigenous world association, “The indigenous understanding of cultural heritage is everything that defines our distinct identities as peoples. It is bestowed on us by our ancestors and endowed to us by nature. It includes our socio-political, cultural and economic systems and institutions; our worldview, belief systems, ethics and moral values; our customary laws and norm (GALDU, 2008). Approximately 400 million indigenous peoples are present worldwide, which constitute about 6% of the world’s population and represent 90% of the cultural diversity. ‘Indigenous’ Peoples are the original stewards of the environment, holding the land of their ancestors in trust for future generations. They are those distinct and vulnerable ‘tribes’ who possess only a limited ability to participate in, and are most often marginalized by the development process (McIntosh, 2000).
Universally, indigenous peoples argue for policies that help preserve and sustain their cultures and systems of knowledge. They strive to retain control over their remaining cultural and intellectual, as well as natural, wealth, so that they have the possibility of survival and self-development (GALDU, 2008). Sovereignty, self-determination and self-governance are primary goals of Indigenous nations worldwide. Indigenous peoples would adamantly seek a future that preserves, respect and honour their inherent rights and dynamic cultures interwoven in lands, languages, traditional knowledge, spiritual traditions, and artistic expression.

Indigenous communities have preserved their cultures in the face of adverse development impacts. Through the authors’ secondary research, as a pattern for successful culturally-defined development; we have identified that successful indigenous peoples informally utilize organizational tools, resilience and sustainability (a three layered model) to preserve their cultural heritage. Successful indigenous people have kept their cultures alive by passing on their worldview, their knowledge and know-how, their arts, rituals and performances from one generation to the next. Furthermore they have preserved their cultural heritage by speaking and teaching their own language, protecting their sacred sites as well as defending their lands and territories, since these are fundamental for sustaining them as peoples and cultures (UNPFII, 2010). This paper describes, what the authors label a three-layered model for cultural preservation, evident in some Indigenous communities, which demonstrates the centrality of cultural heritage for sustainable indigenous-led development. The importance of cultural heritage to development is also examined to further elucidate on the authors description of the flipside: that is, what development looks like in some Indigenous communities where cultural heritage has not been preserved.

Bibliography


Milanes, Laura; Susan Appe
Instructor, University of the Andes, Colombia, lmilanes@uniandes.edu.co
Assistant Professor, Department of Public Administration, College of Community and Public Affairs, Binghamton University, USA, appesusan@gmail.com

"Raising consciousness: The intersection between cultural NGOs and sustainable development in the Andean region"

Academics and practitioners have debated the role of arts and cultural activities in the construction of society. For example, Boal (1979), in his groundbreaking work, The Theatre of the Oppressed, asks "Should art educate, inform, organize, influence, incite to action, or should it simply be an object of pleasure?" (p. xv). Cultural NGOs in particular provide diverse functions. They have been instrumental in constructing a cultural democratic citizenship ( Appe, 2010) and establishing a national identity (Stanziola, 2002; see also Canclini, 2000; Kurin, 2000; Perez de Cuellar, 1995; Varela, 2001; Wallach, 2000). In the Andean region of Latin America specifically, we observe the critical role they play in providing services and promoting political and social change. Cultural NGOs have made these contributions while they face challenges to their survival as cultural projects have had a low priority for funding by the state, and private funding is scarce ( Appe, 2007; Perez de Cuellar, 1995).

What has not been fully examined are the ways in which NGOs in the cultural sector have contributed to sustainable development. We argue that cultural NGOs have generated social and political inclusion through cultural practices. Such experiences can illuminate what it means to manage an organization from the perspective of sustainable development. Some questions we examine are: What are the cultural and management practices used by these organizations to achieve their goals? What is their role in developing inclusive spaces for communities and stakeholders? Are the different components of sustainable development, economic, social and environmental, included in their management?

Regarding the social component, cultural NGOs have shown "social inventiveness" which, as Pearce, Howard and Bronstein (2010) argue, is a pillar of social action in the region (p. 272). What is of interest to this article is the way in which cultural NGOs are creating spaces that promote inclusion and raise "consciousness." We found that the work of some cultural NGOs promotes the empowerment of different groups, most previously marginalized, and inclusion and participation. Thus, these NGOs are drawing paths for inclusion through cultural expressions that allow constructing new discourses on public issues. They are helping to create vibrant spaces for discussion on issues of common concern to members and audiences alike, i.e., alternative public spheres (cf. Habermas, 1989; Jacobs, 2000). These spaces, together, provide an alternative to the traditional public sphere,
which contemporarily is simultaneously articulated in the media. In the traditional public sphere access has historically been restricted to groups that have political and social power (Alexander, 2006; Jacobs, 2000). These functions feed into the framework of sustainable development.

To elaborate our argument, we comparatively examine two qualitative case studies of cultural NGOs. These organizations will be identified through a government database and preliminary survey. We will use semi-structured interviews, participant observation, and archival research. To analyze the information collected, we will use a mix of qualitative methods that will draw from grounded theory and textual analysis (semiotic and narrative).

Semple, William
Architect/Consultant, NORDEC Consulting and Design; PhD Candidate, University of Alberta, Canada, wsemple@ualberta.ca

"Cultural and Environmental Sustainability and the Development of an Indigenous Design Process"

This presentation will examine how cultural identity is a significant ‘sustainability’ component and how this can be advanced through the use of a design process that brings the perspectives and knowledge of Indigenous peoples into the design of housing and communities. This work is being undertaken as the focus of my PhD research at the University of Alberta and in my ongoing work as an architect/consultant in the Canadian north. The presentation will focus on the evolution of a culturally appropriate design process, and the design of the culturally appropriate super-energy efficient northern housing prototypes that have been developed using this process - projects carried out to advance the ‘sustainability’ of northern housing, including the fundamental role that relationships play within Indigenous communities. These include relationships within the extended family, within the community, and with the land.

The presentation makes the case that ‘sustainability’ within Indigenous communities, by its very nature, brings together both cultural and the environmental concerns. On the issues of cultural sustainability the presentation will explore how Indigenous ‘ways of knowing’ and ‘ways of doing’ represent a significantly different world view, one that impacts how the community and individuals share knowledge and experience, and make decisions. It makes the case that to address issues of sustainability within an Indigenous context, both the process of getting there and the outcome of this process are essential and interconnected components.

In exploring these issues, the presentation will examine northern housing projects that I have carried out using what could be considered a ‘culturally
appropriate design process’. This will include discussion on how ‘design charrettes’ were adapted for use on these projects, and how cultural elements were incorporated into the house designs. The presentation will reflect on the crucial importance of delivering significant improvements to the energy performance of housing in northern Indigenous communities, how this was supported by Indigenous values and world views, and how these views supported the energy efficiency targets for these projects. Drawing upon my PhD research, including the work of Indigenous researchers, I will include reflections on the outcomes of these projects and the lessons learned. I will propose improvements to the process, and how these are key elements of what might be considered as part of the development of an Indigenous Design Process.

This presentation is intended to assist those who are interested in the design process, in the challenges of adapting the community engagement and decision making processes for use in a broader range of circumstances, and those who are interested in tapping into a world view that gives equal voice to the inherent relationship between culture and the environment. It is also intended to develop a better understanding of the unique challenges of designing housing and communities that better reflect the values and needs of Indigenous peoples, in this case, the peoples of the Arctic and sub-Arctic, a region that is undergoing substantial transformations due to Impacts of rapid economic development and climate change.

**Watson, Julia**
Adjunct Professor, Graduate School of Architecture, Planning, and Preservation, Columbia University, USA, [jw2815@columbia.edu](mailto:jw2815@columbia.edu)

“The Ancient Technologies of the World’s Ecosystem Dwellers”

The vernacular of the world’s traditional and indigenous peoples has historically inspired innovation in the field of design. However, there has been minimal impact to the fields of landscape architecture or environmental design. Today, designers forge the frontier of environmental innovation focused on high tech solutions, for the most part ignoring the living examples of innovative ecological adaptation found in the global shadow conservation network - the lands belonging to our indigenous ‘ecosystem dwellers’. In the sciences these living innovations are defined as Coupled Human and Nature Systems and are informed by Traditional Ecological Knowledge (TEK). Ecologists and conservation biologists acknowledge that “indigenous peoples live in most of the ecosystems that conservationists are so anxious to protect”[11]. In these environments they design environmental adaptations that are symbiotic, not parasitic. As for the vernacular, can the practices of indigenous peoples have the potential to cast new light upon environmental
design, enhancing ecosystem biodiversity and increasing ecological services. Does indigenous innovation offer answers to the emerging problems of designing for the complex environments of the 21st century?

References
OECD New Approaches to Economic Challenges (NAEC) and the SDGs

Groff, Stephen P
Vice President, Asian Development Bank, Philippines

Mesnard, Mathilde
Senior Advisor to the Secretary-General and Coordinator of the NAEC Initiative, OECD, France

O'Connor, David
Chief of the Policy and Analysis Branch of the Division for Sustainable Development at the UN Department of Economic and Social Affairs, USA

Walsh, Patrick Paul
Professor of International Development Studies, University College Dublin, Ireland; UN Sustainable Development Solutions Network, USA, ppwalsh@ucd.ie

“OECD New Approaches to Economic Challenges (NAEC) and the SDGs”

To manage global risks and deal with emerging policy challenges, a universal, integrated and transformative agenda is needed. The Organisation for Economic Co-operation and Development (OECD) is supporting a new approach to economic growth, one that places people’s well-being first and ensures that enhanced growth does not harm the environment. For that, a change in mind-set, policies and ultimately economies is needed.

The OECD is responding to the Sustainable Development Goals (SDGs) drawing on the cumulative experience of OECD member and partner countries in various interconnected policy areas. With the New Approaches to Economic Challenges (NAEC) Initiative the OECD has learned lessons from the financial economic crisis and is increasingly thinking about uncertainty, spillovers, systemic risks and network effects to help get a better grip on rising global interconnectedness. Policy linkages, trade-offs and complementarities are being better appreciated and economic, social and environmental challenges are being tackled in integrated and coherent ways to achieve multiple goals simultaneously.

This panel will discuss OECD approaches to inclusive and sustainable growth and discusses how this work could help its Members and Partner Countries to achieve the SDGs.
"From local to global: building partnerships with indigenous communities in the tourism sector to strengthen the governance of biodiversity creating inclusive opportunities."

Chiapas has one of the highest levels of poverty in Mexico and the ethnic, economic, and social inequalities still remain. Nevertheless, Chiapas natural tourism attractions have brought positive gains while displaying complexity and diversity, attracting national and international visitors that seek nature and indigenous communities’ knowledge, to possibly transform their behavior to more sustainable ones.

The current economic path where daily life for the majority of the population evolves around practices that are detrimental to the ecosystem cannot continue. The ecosystems and the natural services provided by nature will not be able to adapt. Last January the magazine Science published the updated research of the planetary boundaries. Four of the nine boundaries have been crossed. One of them is the loss of biodiversity now called “Change in biosphere integrity” (Steffenetal2015).

Parallel to this scenario, today the process of democratization in the Latin American region has created a platform where significant participation of indigenous groups has emerged. In the following decade, their participation in development processes in equilibrium with the environment will be essential (Nivón, 2006). Likewise, their customs are intangible values of great importance to national identities that are slowly giving them space to be the pillars in the production of cultural goods (Canclini, 2001). In addition, their inputs have been included to build new measurement of welfare. Their relationship with nature provides opportunities to reconsider new production measurement using more sustainable means in our daily activities (ECLAC, 2014).

The proposal seeks to present the results of the implementation and monitoring of the Business Model that Ecoexperiencias operates in partnership with the Lacandones community while offering tourism experiences, potentiating the governance of biodiversity through educative approaches. We are currently building the bridge to expand our impact, providing advice to local authorities in order to merge our approach with the regional initiative “Chiapas Brand Strategy” that was launched in 2008. The proposal is to adapt the “Sustainability” component, the Ecoexperiencias
Duality Framework, in different sectors of the public, private, civil society, and academia that are part of the Chiapas Brand Strategy.

As other parts of the world, the Mesoamerican region will face dramatic consequences of climate change, including biodiversity loss. Adaptation is already becoming a necessity for many areas, in particular in Central America. In the geopolitical context “the diversity of economic, social and political conditions makes the region a critical area for the testing of new approaches, for the search for innovative ideas, and for the development of areas of regional consensus” (Ramstein et al. 2014).

This is a proposal to transform the individual behavior of tourists that flee cities to more nature friendly locations, reaching collective action, driving the sense of change in citizens. In alliance with the Lacandones, Ecoexperiencias is creating a vision of HOW to look into the future, and WHY we need to manage properly the Governance of Biodiversity. We are convinced that while understanding the complexity at local levels interesting synergies emerge at global scales.

Khalequzzaman, Md.
Professor, Lock Haven University, United States, mkhalequ@lhup.edu

"Sustainable development of water resources in Bangladesh in the context of planetary boundaries and environmental performance index"

Due to low-lying elevations (15% of land below 1 m) and dense population (1,142/sq.km in 2011), Bangladesh is considered one of most vulnerable countries in the world to the impact of climate change. Hydro-meteorological shocks, including inundation of coastal plain due to relative sea level rise, salinity ingress in cropland and fresh water resources, drainage congestion and sanitation, reduction in crop yield, soil moisture loss, salinity intrusion in groundwater aquifer, loss of biodiversity due to decline of the coastal mangrove forest, and impact on human health will prove to be the major challenges related to climate change in Bangladesh. Most land area in Bangladesh belongs to the Bengal Delta that requires uninterrupted, natural flow of fresh water to keep salinity intrusion at bay and sedimentation rates that are greater than the rate of sea level rise. Currently, the uninterrupted flow of water and sediments in trans-boundary rivers are not guaranteed as there exist numerous dams and water diversion projects in upper riparian regions. Bangladesh lies at the receiving end of the Ganges-Brahmaputra-Meghna basins and accounts for 7% of the catchment area. Empirical data indicate that at present, the amount of river-borne sediment flux to the coastal plain of Bangladesh has declined to only half of the 2 billion tons/year in the 1970s, which is not enough to keep pace with the observed rate of up to 17 mm/year of relative sea level rise. The resulting deficit of sediment
Presenters are listed first followed by additional authors. Contact information is for presenters.
Pereira, Masiel
Master's Candidate in Environmental Management, Pontifical Javeriana University, Colombia, masiel.pereira@javeriana.edu.co

"Urban green areas as sources of ecosystem services for human well-being. Management Proposal of urban parks Engativa, Bogota"

As a result of increased urbanization, biodiversity has been highly affected, with implications for human welfare, since the latter depends on the services that ecosystems provide. Due to the existence of a society-nature relationship, the cities and their inhabitants are increasingly vulnerable to the effects of Global Change. It is for this reason that urban green areas play a key role in the generation of ecosystem services and ecosystem services (provisioning, regulating and cultural). Similarly, fulfill ecological functions of connectivity within the Ecological Main Structure (EEP) in Bogotá, Colombia, as well as strengthens the sociocultural identity and social networks for their ability to generate a wide range of ecosystem services, improving the quality of life of its inhabitants.

The research aims to determine the ecosystem services generated by urban parks in the town of Engativá, of Bogotá, Colombia and its relationship to human welfare. That is, how people are benefited by urban parks in terms of ecosystem services.

It develops as an applied, descriptive and purposeful qualitative research type that allows one hand, approaching closer to institutions responsible for managing urban and expert landscaping, and moreover, approach to the user community parks the town, through surveys, so that from the perceptions of the community, identify and analyze the ecosystem services and their relationship to human welfare.

Research has a theoretical support science-based source that allowed identifying and analyzing the trend of knowledge of urban green areas worldwide.

Thus, as a result of research recommendations in management of urban parks conceived in human welfare are proposed, with the need for planning and management of cities like Bogotá, integrated with their natural and social spaces for cities to manage, keep, care for, recover, maintain and expand their common green areas for human welfare.
Telesford, John  
Associate Dean, T. A. Marryshow Community College, Grenada,  
john.telesford@yahoo.com

"Economic activity within Planetary Boundaries (PBs): the industry related link between stratospheric ozone depletion (SOD) and climate change (CC)"

This paper argues that economic activities within planetary boundaries (PBs) must be a critical and explicit part of the Sustainable Development Goals (SDGs). Comparing the ten (10) SDGs suggested by the Sustainable Development Solutions Network (SDSN), to the seventeen (17) deliberated on by the United Nations Open Working Group on SDGs (UNOWG), the SDSN’s Goal-achieve development within planetary boundaries, is fundamentally different to the similar goal proposed by the UNOWG’s, which speaks to inclusive and sustainable economic growth, without an explicit regard for boundaries.

How the transgression of the PB- stratospheric ozone depletion (SOD) - was reversed through the global efforts of the Montreal Protocol and industry, profoundly supports this argument. In this regard, the global phasing out of ozone depleting substances (ODSs) used by the Air-conditioning and Refrigeration (AC/R) industry, has contributed to returning this Earth System process within the proposed boundary. This global industry action, has further demonstrated, that cognizance of PBs can assist industry in making decisions to adjust economic activity that will reverse and subsequently maintain the proposed PBs. Similarly, but with much more effort, the energy industry with its intricate link to the AC/R industry can play a role in reversing the climate change (CC) PB.

Drawing on this example, the paper will first thoroughly interrogate the SDGs and their intended outcome-global sustainability. In the second section, the case for a goal that will guide economic development and growth towards addressing the PBs is presented. In this regard, the fundamental difference between SDSNs and OWGs goals is analyzed and reasons supporting the importance of the SDSN’s goal are proffered. This position is supported by the apparent transition to the era of the Anthropocene and the observed Great Acceleration since 1950. The proposed planetary boundaries and their current status are then presented in the fourth section. The final section presents a case analysis of the SOD PB. In this regard, the actions of the global AC/R industry, guided by the Montreal Protocol are thoroughly investigated. The intricate link of this industry to the energy industry and the CC PB is demonstrated. Critical to this link are the applications of energy efficiency and renewable energy solutions in a quest to de-carbonize the economy. The role of the Kyoto Protocol, to change the course of the energy industry, like the Montreal Protocol did for the AC/R industry is also analyzed. The paper

Presenters are listed first followed by additional authors. Contact information is for presenters.
concludes that economic growth and development placed in the context of PBs is one critical imperative for initiating the implementation of the SDGs.
Scientific Collaboration to Achieve Affordable, Sustainable Energy for Humanity

Biello, David
Energy & Environment Editor, Scientific American, USA

Nathwani, Jatin
Executive Director, Waterloo Institute for Sustainable Energy, University of Waterloo, Canada

Parker, Paul
Professor & Associate Dean, Geography and Environmental Management, University of Waterloo, Canada

Hermansen, Søren Hermansen
Director, Energy Academy, Denmark

Sixty years have passed since the first global wave of mass electrification and yet, nearly 20% of the world’s population – 1.3 billion people – lack reliable access to electricity and close to 40% – 2.6 billion people – are without clean cooking fuel. Solutions to this energy access dilemma promise to ameliorate living conditions for women and children, improve baseline health, provide new opportunities for education, and contribute significantly to economic progress. However, despite initiatives like the UN’s Year of Sustainable Energy for All (2012) current solutions are projected to fall far short of the UN’s universal energy access goal established for 2030. While scientific and technological advances in energy generation, storage, and distribution are critical, creating the capacity to deliver these innovations on a large scale requires an international and multidisciplinary approach. Global ingenuity and cooperation throughout the research and development process coupled with local knowledge and community driven solutions will yield greater success in implementing suitable, sustainable, and efficient technologies. This symposium – a journalist-moderated discussion between three leaders in accessible energy – will explore a major global change initiative that is underway to establish a collaborative platform for research and development of innovative energy technologies to drive large-scale adoption of low cost solutions intended to reach every global citizen.
Social Inclusion (Including Gender & Human Rights)

Belobo Belibi, Marguerite; Fidèle Honorine Yobo A Koue, Judith Van Eijnatten, Charles Kacho Tah; Nathalie Ewane Nonga, Rachid Hanna, Mary Bakia, Léopold Aimé Ndongo, Ntiege Hans Sumelong
Project Manager, Cameroon Cocoa-Eco Project, SNV, Netherlands Development Organisation, Cameroon, mbelobombia@snvworld.org

"Cocoa farming by women: steps towards achieving social inclusion. The case of the Cameroon Cocoa-Eco project"

Cocoa is produced in forest areas in Cameroon and is dominated by male smallholder farmers with cocoa plots of less than 3 hectares and an average low yield of 350 kg/ha. Organisation of cocoa farmers is weak while the rising average age of farmers (50 years in 2014) is evidence that the younger generation is not taking over the business. In 2012 the Government of Cameroon embarked on a range of initiatives to revitalize the cocoa sector in order to meet the country’s ambition for an annual production of 600,000 tons of cocoa beans by 2020. It is clear that without integrating an additional workforce, notably women and youth, the government will have difficulty to meet this goal. The current exclusion of women and youth is largely a matter of barriers related to traditions with respect to farm inheritance, the socially assigned roles of men and women in (cocoa) farming, and associated difficulties in access to production resources including land and credit. The SNV Netherlands Development Organisation, in its “Cameroon Cocoa-Eco Project”, introduced female leadership as a way to help cocoa communities analyse and challenge existing customs. Project interventions were the trigger to break down stereotypes about the roles of men and women in cocoa farming. Women and youth started to participate in Farmer Field Schools to learn modern cocoa production skills. Others became active in cocoa processing, adding value to cocoa beans to produce cocoa butter and chocolate products. This paper shows that, contrary to the paradigm that cocoa farming is a men’s affair, inclusion of women and youth can improve livelihoods, increase family revenues and can play its part in the country’s economic growth. Promoting gender balance in cocoa farming is a powerful instrument for economic progress in cocoa production areas.
Casella, Albert
MDP student, University of Arizona, The University of Arizona, United States, casella2@email.arizona.edu

"Getting Started on the post-2015 development agenda: Identifying Positive Community Change Leaders in Cité Soleil, Haiti"

Ratification of the Sustainable Development Goals (SDGs) has been the impetus of much debate concerning pragmatic and sustainable approaches to the world’s most pressing development challenges. Despite those debates, the international community has recognized the crucial role that collaborating with local residents and eliciting their participation has in sustainable development. This article discusses the challenges and nuances involved in identifying points of entry for external development efforts in Bwa Nef, a neighborhood within Cité Soleil, Haiti. While Cité Soleil is often portrayed as a place rife with normalized violence, positive community leaders exist and are working toward the improvement of their neighborhood. This research initiative seeks to identify positive community leaders within Bwa Nef, and develop a model for appropriate collaboration methods to be used in the future by external development efforts.

Drawing from an ongoing randomized survey of 50 households and ethnographic data, it is becoming apparent that neighborhood residents tend to identify “positive community leaders” as persons who occupy leadership positions in churches, schools, and other local institutions. Challenges in the surveying process are described herein, as are adjustments that were made during the research process. Next steps include engaging the “positive community leaders” to identify appropriate and helpful methods for participation with international aid groups. We conclude by discussing the potential positive impacts that appropriate engagement with positive community leaders could yield, particularly for youth development in Cité Soleil.

Chun Yin, Lin; Jenn-Bang Shiau
PhD Candidate, Department Philosophy, National Central University R.O.C., Taiwan, helen@mail.mcut.edu.tw

"An Inquiry into the Sustainable Development of Book of Changes"

This essay attempts to illustrate that into the Book of Changes which from classical Chinese philosophy, suggesting a simple natural law and moral obligation. Currently we value humans over the nature, so we abuse natural resources and cause the present ecological imbalance. The Book of Changes ideas are to focus on the needs of people and how to face such a change and find practicality are the goals that we would work for. This essay also
suggests that the happiness of an individual can only be achieved when the integrity of the ecosystem as a whole is maintained, and the human being as an entity of the ecosystem must exercise moderation to lower the impact on the ecosystem. In addition, we should give ethics more precise theoretical grounds under the background of science and this background should cover psychology and ecology so that the derived philosophical content and foundation could sustain trials through time.

Marks, Kristen
MDP Candidate, University of Florida, United States, kmarks2@ufl.edu

"Fostering Change Through Youth Leadership: Leadership Development Training for Young Women in Goa, India"

While sex trafficking, or the trade of people for commercial sex work, has been around for much longer, it has emerged in recent years as a major international human rights concern. With effects of sex trafficking being multifold and far-reaching, it is important to ensure that women and children do not become victim to this trade and to challenge underlying beliefs about life options for girls. Leadership development lies at the heart of this. Effective anti-trafficking initiatives empower young people, challenge deeply rooted perspectives about gender and life options, involve participatory activities, and create new forms of community leadership.

Presenting the results and experience of field work occurring from May 15-July 31, 2015 in Goa, India, the poster will convey the role of youth leadership development in implementing the SDGs, combating sex trafficking, empowering women, and promoting lasting change and social inclusion. In partnership with Rahab’s Rope, a non-governmental organization that works with women and children at-risk or affected by sex trafficking, a leadership development training for young women, ages 17-22, will be developed, implemented, and evaluated. Young women in this area of Goa usually have little education or marketable skills, leaving them at great risk of being trafficked. It is crucial to provide these women with increased opportunities outside of the sex trade and positive beliefs about their role in fostering change for themselves and others. As a result of the leadership training, the young women are more empowered in future and current leadership roles, further reducing their risk for involvement in sex trafficking and promoting human rights, empowerment, and social inclusion, which are all key components of the SDGs.

To develop the training, interviews with staff and participants, research, and observation are utilized. The curriculum covers decision-making, communication, critical thinking, gender empowerment, self-esteem, confidence, and body image. It addresses underlying issues and mentalities,
such as pervasive feelings of hopelessness that leave women vulnerable to trafficking. The training will be evaluated through surveys and interviews, and the poster will also report on best practices and lessons learned. These insights on the role leadership development plays in combating trafficking are useful for organizations and practitioners working towards the SDGs in related capacities. The hope is to not only help curb sex trafficking, but to equip leaders to bring lasting change to their communities. This change and the ability of young people to be agents of change are necessary in the fight against sex trafficking and for the realization of the SDGs.

Nair, Vidya; Srividya Sheshadri, Christopher Coley, Rao R. Bhavani
Research Assistant, Ammachi Labs, Amrita Vishwa Vidyapeetham, India, bhavani@ammachilabs.org

"Training India’s first female toilet builders: An argument for improving sanitation through women empowerment and social inclusion"

Basic sanitation facilities are inaccessible to 40 percent of the world’s population. The call to address the Sustainable Development Goal of “ensuring availability and sustainable management of water and sanitation for all” has never been so urgent, especially in developing nations such as India. While numerous attempts have been made to rectify the lack of access to sanitation in India, nearly half of India’s population continues to practice open defecation due to a lack of infrastructure and awareness. The environmental and health consequences of this have a devastating global impact.

Efforts by the Indian government and NGO’s have yet to provide adequate infrastructure or induce the kind of behavior change necessary to end open defecation on a national scale. This could be due to the limited extent sanitation projects have managed to achieve socially inclusivity among marginalized communities.

Inadequate sanitation is a problem that requires immediate, collaborative action across disciplines, and it may be worthwhile to consider alternative strategies. The challenges to improving sanitation in India are manifold, especially lack of awareness, an inability to afford the construction of toilets, and a complexity of cultural beliefs around cleanliness. This paper will explore a strategy that is beginning to show a shift in attitudes and behaviors around personal and environmental sanitation by implementing a Technical and Vocational Education and Training program for women. This strategy proposes that the goal of improving sanitation may best be achieved by empowering women and girls. The target populations of this project are communities who lack access to adequate sanitation facilities, and are primarily in rural, village settlements. The program provides skill
development to communities, especially women, in how to construct and maintain their own toilets, as well as raise awareness on the importance of good sanitation and hygiene. The union of these SDGs leverages participatory, socially inclusive strategies for sanitation and community empowerment.

This strategy creates new incentives for improving sanitation. The training makes available a viable source of income for a population struggling with poverty. The students of the training program are also educated on the importance of practicing proper hygiene for personal, environmental and community health. Empowering this population through skill development to build, maintain, and promote the use of toilets in their own communities not only improves overall sanitation, but invokes a cultural shift.

By empowering women, traditionally marginalized, to transform their villages into healthy, model human settlements, a revolution can take place that will sustain development efforts. The purpose of this paper is to contribute to the conversation on improving sanitation in India, with the understanding that a successful strategy in this context will have substantial and global relevance.

**Neher, Frank; Apollonia Miola**
Scientific Officer, Joint Research Center of the European Commission, Italy, frank.neher@jrc.ec.europa.eu

"Social Inequalities and Countries’ Ability to Cope with Extreme Weather Events"

Sustainability and resilience are closely related concepts. Resilience refers to the ability of a (socioecological) system to maintain its functioning if exposed to shocks. Sustainability refers to an equilibrium development path that can be sustained on the very long run by accounting for the dependencies and interdependencies between the economic, the social and the environmental system. Resilience, which entails the ability to cope and to adapt, can thus be seen as a prerequisite for sustainability.

Anthropogenic climate change contributes to increasing mean temperatures and weather variability. Changing precipitation patterns and more frequent and more severe extreme weather events are the result. The impact of a given hazard event on exposed entities depends on the vulnerability and resilience of the latter (IPCC 2012, 2014).

In the literature it is well established that vulnerability and adaptation depend on the level of development and institutional quality both on the macro and the micro level (e.g. Dow et al. 2006, Wheeler 2011, Lazzaroni et
Increasingly there is also recognition of the importance of the distribution of rights and resources and the detrimental impact of social inequalities. However, the empirical literature that quantifies the determinants of direct and indirect costs of disasters and extreme weather events mostly ignores those aspects of distribution. Exceptions are Anbarci et al. (2005) and Kuhn (2005), which show that the death toll from earthquakes and natural disasters are positively and significant correlated with the Gini coefficient of the income distribution.

Using multivariate estimation techniques we analyze how gender inequality and income inequality affect a country’s ability to cope with extreme weather events to understand how the sustainability goals of gender and income equality are related to a country’s resilience to climate change. We test two main hypotheses: (1) Ceteris paribus the impact of a given hazard is higher in countries with more unequal gender rights. (2) Ceteris paribus the impact of a given hazard is higher in countries with a more concentrated distribution of income. The impact is measured using multiple indicators of development (life expectancy, health outcomes, schooling, agricultural output, GDP and growth).

We argue that social inequalities are negatively related to social cohesion and trust that are prerequisites for cooperation and the provision of public goods that are necessary for a society’s adaptive capacity and ability to cope. Anbarci et al. (2005) provide a theoretical model where cooperation is necessary for the universal provision of adaptive measures with public goods character. If income inequality exceeds some threshold level, the rich will no longer participate in the provision of the public good and will only provide private adaptation for themselves. Germano et al. (2014) argue, based on the recent theoretical concept of evolutionary entropy, that societies that are more equal are also more resilient. The underlying mechanism is again attributed to a higher level of cooperation among agents in such a society with flat hierarchies.

Owens, Nicole
Master’s of Development Practice Candidate, University of Waterloo, Canada, nowens@uwaterloo.ca

"Tossed Out and About: Forced Migrations Caused by the Effects of Hurricane Katrina"

Hurricane Katrina, the category 5 storm that hit the Gulf Coast on August 29, 2005, caused “the largest population displacement in the United States since the Dust Bowl” in the 1930s (Landry et al., 326). Consequently, it has been one of the most expensive natural disasters the US has ever faced, affecting millions of people. A lack of proper infrastructure and negligent evacuation
protocol further exacerbated the negative effects of the natural disaster. Huge masses of people were displaced, causing a rapid migration of environmental refugees and creating a burden on receiving communities known as Katrina Fatigue.

The research questions for this paper are to determine who were displaced, what the role and impact of the forced migrants had upon New Orleans and the receiving communities, and if there were barriers or challenges that the displaced and receiving communities faced.

The approach here was to compile a library of relevant FEMA information, peer reviewed articles, and government websites in order to review migration patterns, impacts of migration, and to develop potential solutions to avoid or lessen the burden of migration. The ultimate goal was to determine if there were any lessons that could be used in other natural disaster prone areas.

Results from the research determined that race, class, and gender demonstrated huge disadvantages before, during, and after the hurricane. Pre-Katrina New Orleans had a population consisting of a majority Black population with 61% with 35% of this group falling below the poverty line (U.S. Census Bureau 2000). The majority of those falling at or below the poverty line were situated in communities in the Lower Ninth Ward; a disaster prone area due to its geographical features and poorly designed levees. As this area was naturally more dangerous, it was inexpensive to live there leaving a vast impoverished population. The large proportion of Black individuals in the Lower Ninth Ward were therefore more vulnerable than the rest of the population which also meant they had a harder time recovering from the natural disaster.

The city’s population had been slowly in decline decades before the storm and unsurprisingly dropped drastically afterwards. This ultimately harmed the potential for economic growth and the ability to rebuild the city. The population has slowly started to increase but has yet to reach its original size of 455,188 (pre-Katrina in 2005), reaching only 83% of that population almost 10 years later in 2013.

To conclude, Hurricane Katrina was a major catalyst for the US population to review infrastructure and natural disaster relief protocol. The effects of Hurricane Katrina caused mass migration, a large amount of destruction, and loss of physical property, community, and population. It was ultimately a manmade disaster that ensued in the displacement of hundreds of thousands of people and emphasized the inequalities amongst the American population.

References

Rkiouak, Laylla
Research Fellow, WANA Institute, Jordan, lrkiouak@gmail.com

"A regional ethics-based sustainable development model for the WANA region"

The West Asia and North Africa (WANA) region, with a population of 355 million stretching from Morocco to Iran offers tremendous diversity in both natural and anthropogenic landscapes. The region is currently facing diverse and multi-faceted development challenges, with Syria, Yemen Iraq, Gaza and Libya engulfed by conflict, Tunisia and Egypt stagnated by governance transition, and oil rich countries benefiting from their economic growth. Youth unemployment, national security and homogeneous economies are challenges impacting the entire region. The region is further threatened when considering present data on freshwater availability and water demand. The region faces large-scale threats to its sustainable development and to the viability and existence of the ecological systems (El-Zein et al. 2014). How to transition to a more sustainable system while maintaining or increasing economic and societal well-being is a key question for the WANA region.

This project proposes that viable transition requires the development of new, ethically-centered, sustainable development model. Moreover, the development of a model inspired by Islamic values may be one means of responding to the ethical gap within the sustainable development discourse. The globalised sustainable development model leading towards a pre-determined direction to reach global agendas need to be reviewed to include regional ethical values for its effective implementation. Elaborating and including Islamic principles within such a model for the WANA region will facilitate more responsive programming and hence sustainable transition.

Numerous studies have documented the link between Islam and the Environment; the Quran (the Islamic sacred book) and Prophetic traditions encompass various principles on environmental ethics (“Islam and the Environment: A Bibliography” 2015). Islam recognizes the collective role of humankind as stewards of the Earth (Abdul-Matin and Ellison 2010). However, the current socio-economic system seems to disconnect ‘the roots and the branches’ of the Islamic tree of faith in the WANA region (the roots are the beliefs and the branches the actions) (Gabbasa et al. 2013).
Reintegrating Islamic values into the natural resource management discourse could be the key to a more sustainable and inclusive system (Al-Jayyousi 2012). Moreover, considering Islamic ecological and ethical values might constitute new parameters for progress in the Islamic global community.

This project develops an ethics-based sustainable development model based on Islamic principles. It includes natural resource management models such as al Hima, a traditional system of natural resource management used in the Arabian Peninsula (Llewellyn et al., 2007). Al Hima, literally meaning protected land, recognises the need to respect natural cycles of regeneration and to preserve biodiversity for the common good. The concept encompasses the ecological and human dimensions of sustainable natural resource management.

Based on Islamic principles, the ethics-based sustainable development model will be centered on human dignity (Al-Jayyousi 2012). The model will be based on four pillars: (i) economic, social and ecologic justice; (ii) the excellence concept: the need for continuous re-examination; (iii) social capital whereby the community network extends from family to neighbourhood; and (iv) modalities for limiting mischief and corruption as a key step towards achieving a balanced state and social equity.

**Simms, Rhea**
Student, University of Waterloo, Canada, rhea.simms@uwaterloo.ca

"The Role of INGOs in the Struggle for Land Rights in Ratanakiri, Cambodia"

Can development aid have a sustainable impact on a population that has no legal rights over their land and lives constantly in fear of displacement? This is the reality for Ratanakiri province in northeastern Cambodia. Considered one of the poorest provinces in the country, the government of Cambodia has taken to providing economic concessions for land, handing over large portions of inhabited land to large businesses for cash crops and logging since the 1980s. Further increasing the vulnerability of the population of Ratanakiri is the fact that 80 percent of the communities comprise of indigenous ethnic minorities (Colm, 1997). These groups are marginalized within Cambodian society, facing significant barriers in declaring themselves as legal entities and gaining ownership over their traditional lands.

Local non-governmental organizations have been working in the years over the last decade, assisting indigenous minority ethnic communities in the complicated, bureaucratic process of registering as a legal entity and eventually claiming common land entitlement. They are also working to teach communities about their land rights and advocating at the provincial
and national levels. However, while these efforts are well intentioned and successful in their own way, there has been little impact on the overall situation. As of today there are only eight indigenous communities that have received land titles in all of Cambodia (NGO Forum, 2014). Working within Cambodia’s government system, ranked 156 out of 175 countries on the Corruption Perception Index (Transparency International, 2015), has proven time and resource intensive.

The proposed presentation for the International Conference on Sustainable Development will provide tangible recommendations for the role of international bodies, with specific focus on international non-government organizations, in further promoting land rights issues within Ratanakiri province. This solution will work within the government framework and avoid taking an activist stance as so many local NGOs have taken. The solution will be formulated through three months of intensive research in Cambodia from May - July, 2015. While no clear solution is available at this time (as the research period has just begun) results are anticipated to show a clear role for INGOs in high level coordination efforts to improve land rights in the region and nationally within Cambodia.

References
POSTER SESSION

Accountability and Evaluation

Kuhner, Martina
PhD Candidate, Faculty of Arts and Social Sciences, Maastricht University, Netherlands, martina.kuhner@maastrichtuniversity.nl

"Lessons Learnt or Lessons Un-Learnt For a Useful Monitoring Framework for the Sustainable Development Goals"

The success of the new Sustainable Development Goals (SDGs) will not only depend on the content and ambition of the goals and targets and broad political and societal support, but also on effective implementation mechanisms. As the SDGs are not legally binding, only ‘soft’ ways of tracking and facilitating progress are possible. The High Level Political Forum on Sustainable Development (HLPF) is mandated to take on this role and shall, among other tasks, “follow up and review progress in the implementation of sustainable development commitments”. It is expected that the HLPF will start conducting reviews of countries’ implementation of the SDGs and of progress made on specific themes from 2016. Reviews will, however, be voluntary, without any binding character. Instead, the HLPF shall focus on its facilitative role to enable knowledge exchange, mutual learning and transparency on progress on the SDGs. The key issue is how exactly this mechanism will be designed and how it will work in practice. An interesting question in this context is to what extent experience with existing monitoring and review mechanisms have been taken into account. Understanding the extent to which different stakeholders perceive existing mechanisms as useful or less so might give helpful indications on the potential usefulness perceptions of the monitoring and review components of the HLPF, and finally its effectiveness, as it is eventually organized.

Looking at the experiences of previous monitoring mechanisms in this policy field helps to derive lessons learnt and gives insights into these questions. This study focuses on the Monitoring of the Millennium Development Goals (MDGs) and discusses which elements of monitoring have been found useful or not by different stakeholders and what reasons were given for such (lack of) perceived usefulness. The empirical data presented in this poster is derived from interviews with relevant stakeholders and existing evaluations of the Monitoring Framework of the MDGs. It is assumed that specific aspects related to the institutional design of these monitoring structures, such as the level of inclusiveness or the design of the indicators, are linked to usefulness perceptions of different stakeholders.
Thus, the empirical data are used to identify perceptions of useful and less useful designs for the monitoring of the MDGs and international commitments in the field of Sustainable Development more broadly. The study derives lessons learnt from these insights and also investigates to what extent they are reflected in the Monitoring Framework of the SDGs under the HLPF (or the ongoing negotiations thereof). Lessons learnt have been shaping (at least to some extent) the discussions on the design options for a new architecture for monitoring the implementation of the SDGs so far. As it is expected that these usefulness perceptions will (or at least should) continue to color the decisions on the form and functioning of the monitoring and review functions of the HLPF, the presentation contributes to the ongoing political and academic discussions on options and consequences of different monitoring set-ups for the SDGs.

Warakagoda, Ranjika; Nirosha Welgama, Samantha Lindsay, Bernie Yatawara
MDP Alumna, University of Peradeniya, Sri Lanka, ranjikawarakagoda@gmail.com

"Strategic Essentials for Sustenance of Community Base Organizations Instituted and Assisted by International Development Agencies"

Instituting and assisting community base organizations (CBOs) is a common practice by local and international development agencies (IDA) to tap the local level social capital and execute development work at ground. These organizations are expected to build civic capacity from which communities are empowered to improve their own lives. Many theories and practices have evolved over the decades suggesting varied types of models, structures and standards to establish and sustain such CBOs. However, no model or structure has been identified as superlative one against another, for depending on instituted objectives and mandates each CBO tends to appear in different forms, structures & models. The general perception on IDA assisted CBOs is that they become unsustainable when IDA funding & technical assistance are discontinued due to various reasons. In light of the above perception this study examined the strategic essentials that need to be in place for CBOs to function at optimal level and be sustainable when IDA funding and/or technical assistance comes to a closure. This is a case study analysis done in 9 districts in Sri Lanka focusing on 13 CBOs instituted for the purpose of Education, Micro-Finance and Water & Sanitation assisted by 4 IDAs namely Asian Development Bank (ADB), World Vision International (WVI), World University Services of Canada (WUSC), and CARE International. The selected CBOs have been formed for development purposes functioning over 3-10 years and recognized under legal and administrative systems in Sri Lanka. The sustainability component was ensured based on five main assessment areas:

1) Purpose of formation,
2) Organization structure,
3) Operational
4) Management competency
5) Financial management
6) Willingness-to-sustain the system.

Each of the case studies was carried out after 3 years of discontinuation of IDA assistance.

The findings shows that 6 out of 13 CBOs have been concluded as sustainable within the three year period indicating the strategies followed in establishing, developing and sustaining the CBO has been successful. Based on the finding few areas were agreed as strategic essential to sustain CBOs.

1) Engaged with IDAs for a minimum time period 8-10 years to establish organizational stability
2) Affiliate & partner with state institutions & structures to ensure structural sustainability and security
3) Consider profit base objectives over equity & rights base intentions
4) Decisive paradigm shift from dependency mentality and nurtured sense of ownership.
5) Motivated & enduring leadership
6) Committed and competent staff for financial and operational requirements.
Agriculture, Food Security & Nutrition

Audate, Pierre Paul
Technical Director, iF Foundation, Haiti, paudate@catie.ac.cr

"iF Foundation Innovative Agricultural Value Chain Approach to fight Food Insecurity in Rural Haiti."

Despite the vast amount of money being spent in agricultural sector by NGO, international organizations, and governments in Haiti, little has been seen as positive impact in the fight against food insecurity in this country. As the challenges of agriculture, food insecurity and poverty require innovative approach to create jobs, increase production and enabling the market environment. iF Foundation is aware that those are very pressing problems in a country like Haiti. In 2013 it started an agriculture program to increase farmers income in 10 communities in the Northern of Haiti. This market-oriented program has 4 components: Research, Training, Production and Commercialization. The foundation researches on best practice, techniques and technologies to advise farmers, but without training, most farmers couldn’t know the best ways to maximize farm profitability, so the foundation also built a Technical center to provide training to farmers and stakeholders in order to build capacity in those communities. As knowledge is not the only resource farmers need to succeed, the foundation delivers farm inputs on credit to farmers. After harvest the foundation help farmers to store their crops safely and link them with local traders. They also develop market for new products in order to diversify farmers’ income. This program has been positively impacted rural community in the northern of Haiti. Farmers have clearly expressed their interest on such market-oriented program. This research aims to analyze through interviews and focus groups this integrated agricultural value chain program and present its social, economic and environmental impacts in the northern areas of Haiti.

Chiappini Carpena, Pietro
Senior Agricultural Advisor, Gorta-Self Help Africa, Ireland, pietrocc@selfhelpafrica.net

"Resilience programming frameworks in post 2015"

This paper presents Gorta-Self Help Africa’s Resilience Programming Framework – an approach aimed at enhancing the ability of vulnerable communities to overcome multiple threats to food and nutrition security and address the fragility of current food production systems.
The framework provides a holistic and integrated approach to implementing livelihoods programmes and projects. It is designed to help vulnerable communities, and the organisations working with them, to understand and manage risk – from immediate shocks such as floods or crop failure, to long-term stresses such as climate change or social exclusion. It also aims at empowering poor women and men to move beyond survival, seizing new opportunities to improve their livelihoods while at the same time safeguarding past gains. We believe that combining resilience and livelihoods work will foster communities that are both thriving and sustainable.

We propose a set of programming principles and methods to empower smallholder farmers, pastoralists and forest-dwellers, thus enabling communities to intervene in, and alter, the structural causes of vulnerability to natural and anthropogenic shocks and stresses. By recognising that guidance alone is not sufficient, we are committed to using the framework as the basis for developing staff and partner skills, capacity, understanding and confidence in this approach.

Our resilience programming framework foresees three types of integrated and complementary outcomes: a) food and economic; b) ecological; and c) organisational.

Through our work with some of the most vulnerable communities in Africa, where the focus is on sustainable solutions to long-term drivers of vulnerability, we are already engaging in resilience-led initiatives. However, there is a need to clearly identify what characterises resilient livelihood systems, and to define the way in which to measure the impact of successful interventions. The final test of adaptation success therefore relates to securing improvements in the material wellbeing of human populations and reducing losses and damages from climate-related stresses.

Our current research will contribute to the identification of appropriate indicators and measurement tools to be used to track trajectories of households or communities coping with setbacks in relation to food security in different programmes, locations, populations, etc., which would allow for comparison across contexts.

The approach outlined aims to open up opportunities for poor women and men to assess and analyse their situation, take action to improve it, work with decision makers and, ultimately, regain control over their lives. We recognise this will take time and perseverance – but as communities develop increasingly resilient livelihoods, we hope they will take ownership of this approach and share their experiences with others to build resilient and thriving societies.
Maynard-Li, Nicole  
Master of Development Practice Candidate, University of Waterloo, Canada,  
nmaynard@uwaterloo.ca

"The Industrialization of Seed: A Socio-Economic Assessment of Agronomy in the Global South"

There is no denying the presence of genetically modified (GM) crops worldwide, and public opinion on the central issues is very much divided. Climate change and global warming have increased the severity of pests and spread disease to varying crop species, leading to an increase in pesticide usage and soil degradation. The question which this paper aims to answer is whether GM crops are the solution, or if other forms of agronomy, combined with more sustainable traditional practices, is the way to restructure the global food system and combat issues of global food insecurity. This paper will provide a detailed assessment and analysis of the socio-economic implications associated with the agronomy of genetically modified seeds in much of the global south. The socio-economic issues examined in this paper are of importance because they show the industrialization of seed that has occurred throughout the world; particularly affecting farmers in the poorest regions. These issues will also highlight how small-scale farmers have to adapt with the changing economic and environmental climate.

There has been much debate surrounding genetically engineered or genetically modified crops in terms of their safety, costs, nutritional value, and ability to combat issues of world food production and security. There is a definite need for biotechnology in the developing world, but how far is humanity willing to go? This paper will carefully consider both the negative and positive outcomes and opinions which have arisen throughout the world since the introduction of patented seeds and GM technology, to ultimately assess what impacts these technologies are having on developing countries in terms of culture, economy, ecology, and their influence on global food security. With the majority of the world’s population now living in urban spaces, this paper will explore various options and technologies for feeding crowded cities that sprawl into limited farmlands. This paper will also analyze the various health claims made by each side of the GM debate in terms of nutritional content and the possible effects of genetic manipulation on living organisms.

Through its findings, this paper will conclude that although GM technologies are influential in the fight towards a sustainable food system, the negative implications associated with genetically modified crops make the sole reliability on GM technology an undesirable and unsustainable method for increasing global food security. Case studies will be used to illustrate the socio-economic effects GM technology has had on the developing world to highlight what has and has not been successful, with the aim of discovering
new sustainable technological solutions. Overall this paper will propose that a new method of agriculture be developed which incorporates sustainable farming with aspects from GM technology, in order to move towards a sustainable form of agriculture that can be adopted on a global scale to guard against climate change and overpopulation.

Mgolozeli, Sibongiseni; EH Tesfamariam, YG Beletse
MSc Candidate, University of Pretoria, South Africa, steinger23@gmail.com

"Yield, Nutritional Value and Growth Response of Jute Mallow (Corchorus olitorius L.) to Soil Water Availability"

Jute mallow (Corchorus olitorius L.) is an erect annual indigenous leafy vegetable crop classified under the Tiliaceae family. It grows well in the tropical and subtropical regions with mean annual rainfall range of 600 – 2000 mm and temperatures of 15 to 38oC. Jute mallow exhibits therapeutic functions and is nutritionally rich in phyto-chemicals, such as vitamins, phenolics and is a source of micronutrients. Despite this, there is little information, if any, about the cultural practices that influence the growth, yield, and nutritional value of the crop. The aim of this study was to (1) investigate the interactive effect of planting density and water availability on total harvestable yield (stems and leaves), yield edible portion (leaves and young tender stems) of Jute mallow, and (2) investigate root growth response of Jute mallow to planting density and water availability

A field experiment was established under a rain-shelter at the experimental station of the Agricultural Research Council, Roodeplaat, Gauteng, South Africa. The trial was laid out on the field as a two factorial experiment arranged in a randomized complete block design with three replicates. The irrigation trial consisted of three irrigation levels: Irrigating to fill the profile to field capacity (FC), irrigating to 80% of the plant available water (PAW), and irrigating to 60% of the PAW. Irrigation was applied every fifth day and soil water content was measured a day before irrigation using neutron water meter. Each irrigation treatment was tested under three planting densities, namely: 100 000, 167 000 and 330 000 plants ha-1. Composite raw edible fresh (leave and young tender stems) samples were taken for nutritional content analysis. Destructive and non-destructive root samples were taken to measure root growth response to plant water availability. Total dry matter yield was determined from four harvests and nutritional content analysis was determined only from the second harvest.

The highest population density of 330 000 plants ha-1 gave the highest harvestable yield (leaves and stems) under water and nutrient non-limiting conditions followed by the 167 000. However, 167 000 plants ha-1 produced higher yield edible portion (leaves and young tender stems) in contrast to
other planting densities. In addition, high nutritional value was attained under 167 000 plant.ha-1 using 80%PAW. Irrigating to FC increased the root diameter and root dry weight while decreasing root volume.

The moderate planting density of 167 000 plants ha-1 irrigated to 80% of the PAW seems to be ideal for it saved 20% of irrigation water compared with the treatment irrigated to FC and it also gave the highest edible yield and best nutritional value compared with the planting densities of 100 000 and 330 000 plant.ha-1.

Ndione, Ya Cor
PhD Candidate, UCAD, Senegal, mamicor9@yahoo.fr

"Analysis of the pluriactivity of Senegalese rural households"

Pluriactivity of rural labor has been mostly addressed in developed countries where it has been analyzed at an individual scale. It remains little studied in the African context. At a time when diversifying income sources is increasingly recommended to overcome rural poverty, little is known about pluriactivity of rural households in Africa, particularly in Senegal. Because rainfed agriculture predominates and involves underemployment of rural labor, pluriactivity remains important in Senegalese rural areas. Determinants of such a strategy and correlative its effects on income generation are poorly known. Thus, this paper contributes to analyze its determinants and investigate implications of this strategy on the income distribution model of rural households. Some authors find that the promotion of non-agricultural activities is not necessarily consonant with an improvement in income distribution. We also examine the role of this pluriactivity: is it a strategy developed to continue farming or a channel to migrate to other non-farm rural activities. This study uses primary quantitative data on 1500 rural households and qualitative data collected in 2013 in three agro-ecological zones of Senegal different in terms of demographics and agro-climatic features. Our results have shown that household characteristics, land status, produced crops and the level of farm incomes highly influence pluriactivity choice. Pluriactivity plays a major role in household survival in rural Senegal, reinforces stability in their farm activities but does not constitute a farm exit. Finally, pluriactivity of households leads to a more equitable income distribution.
"Overcoming Food Insecurity in Nepal"

Nepal, classified as a low-income country, has a population of 27.8 million and a GDP of $19.29 million (World Bank, 2015). The country is heavily dependant on the agricultural sector which constitutes about 32 percent of the country’s GDP (Maharjan et. al., 2012). With more than 80 percent of the population living in rural communities, there are significant disparities in health, education, and wealth across the country (MoPH Nepal et. al, 2014). This paper will explore the threats to food security faced by rural populations in Nepal and the role of women in addressing these issues.

Despite significant progress over the last 2 decades, almost 25 percent of the population still lives below the poverty line (Government of Nepal et. al., 2013). As of 2009 approximately 20 percent of the population, 6.4 million people were considered food insecure, and 13 percent of children in Nepal suffered from acute malnourishment (Oxfam International, 2009).

This trend can be attributed to three main concerns: climate change and other environmental factors, male out-migration, and civil conflict. Climate change which had led to unpredictable weather patterns, including the 2008 drought and recent earthquakes in early-mid 2015, has enhanced past and current challenges to achieving food security within the country. Furthermore, the country has experienced a significant increase in out-migration from about 88,000 in 1942 to more than four million in 2008 (Gartaula et. al., 2012). This increased the burden of work on women in society leading to a shift away from an agricultural based economy towards a more diverse income base - including remittances. Finally, the civil conflict spanning decades in Nepal has had a tremendous impact on agricultural production and market functionings within the country (United Nations World Food Programme, 2009). These factors have led to a reliance on neighbouring markets for imported foods, leaving the country vulnerable to trade limitations and fluctuating market prices.

Most Nepalese are reliant on expensive food imported from India. The 2009 food crisis showed that many poor rural families were spending up to 78 percent of their income on food (United Nations World Food Programme and Nepal Development Research Institute 2008). This allows for a high level of vulnerability in terms of food price volatility (Kilpatrick, 2011).

Women play a vital role within the Nepalese society, taking on multiple responsibilities including reproductive, productive, and community workloads. Due to the increase in male out-migration, rural women, more than their male counterparts, take the lead in agricultural activities, making
up to 55 percent of labour force (Halbrendt et. al., 2014). Through such a view, this paper will demonstrate that implementing programs targeted at improving the capabilities of rural women in Nepal will have a direct impact on the increase of local food supply, and reduction of food insecurity within the country. Please contact authors for references.

**Rocha, Lucas; Ronnie Carlin, Paola Guérón, Rafael Quijada**
Bachelor’s Degree Candidate, Development and Environment Department, Zamorano University, Honduras, lucas.rocha@est.zamorano.edu

"Bringing adaptation alternatives to climate change to small scale farmers: Narrowing the gap between Academy and Society from the students’ perspective"

The Panamerican Agricultural School “Zamorano” is a non-profit agricultural University located in Honduras, that promotes applied research of environmentally-friendly technologies for their implementation in developing countries in order to contribute to poverty alleviation that prioritizes the sustainable use of natural resources, and the implementation of adaptation measures to small households facing the challenges pose by climate variability and change.

Zamorano is part of the dry corridor of Central America and more than 3,000 hectares of its campus are used for research, conservation, production and education. During the last decade it has become an important scenario for developing climate change adaptation and mitigation strategies for the region. Zamorano’s institutional mission also incorporates extension activities to enable people to improve their livelihood and communities through partnerships that put experience and research knowledge to work. The "Learning by doing" approach that characterizes Zamorano, allows students to integrate knowledge and solve problems in different professional environmental and social practices that reflect real-world situations. With this knowledge and tools students can teach farmers, communities, industry and academy, state of the art scientific concepts, methodologies, technologies, risk management, and adaptation and mitigation measures to climate change.

Zamorano established in 2012 a learning-by-doing training program called “Integrated Crop Management and Climate Change”. This module teaches students how to develop resilient, climate-smart agricultural systems using rational and affordable strategies, in such a way that ecosystem functions and services can be maintained and livelihoods can be protected. Students learn to carry on a Farmer Field School that promotes soil conservation practices, efficient irrigation, watershed conservation and management, crop diversification, water harvesting, integrated pest management and
permaculture among others. In the module students work with basic food crops such as maize and beans, as well as cattle and horticulture. An essential goal of the program is to promote an innovative culture for sustainable agricultural production and decision making along with rural extension to improve communication with farming families. During the last two years, more than 350 students from 18 countries from Latin America have been trained in the subject matter and 12 undergraduate projects have been completed on crop management and climate change. The module has been successfully implemented in communities around the university campus. As a result, more than 50 families have been benefited from the program as families were trained in the application of conservation technologies to increase the resilience of their production system against climate change.

**Singh, Sukhwinder**
University of Reading, India, sukhrec@yahoo.com

"Farmers' Perspective on Soil Health in the Indian Punjab: A Quantitative Analysis of Major Soil Parameters"

Although soil health, which is recognized as one of the key determinants of sustainable agricultural development, can be measured by a range of physical, chemical and biological parameters, the widely used parameters include pH, electrical conductivity (EC), organic carbon (OC), plant available phosphorus (P) and potassium (K). Soil health is largely affected by the occurrence of natural events or human activities and can be improved by various land management practices. A database of 120 soil samples collected from farmers' fields spread across three major agro-climatic zones of Punjab suggested that the average pH, EC, OC, P and K was 8.2 (SD = 0.75, Min = 5.5, Max = 9.1), 0.27 dS/m (SD = 0.17, Min = 0.072 dS/m, Max = 1.22 dS/m), 0.49% (SD = 0.20, Min = 0.06%, Max = 1.2%), 19 mg/kg soil (SD = 22.07, Min = 3 mg/kg soil, Max = 207 mg/kg soil) and 171 mg/kg soil (SD = 47.57, Min = 54 mg/kg soil, Max = 288 mg/kg soil), respectively. Region-wise, pH, EC and K were the highest in southwestern district of Ferozpur whereas farmers in north-eastern district of Gurdaspur had the best soils in terms of OC and P. The soils in the central district of Barnala had lower OC, P and K than the respective overall averages while its soils were normal but skewed towards alkalinity. Besides agro-climatic conditions, the size of landholding and farmer education showed a significant association with Soil Fertility Index (SFI), a composite index calculated using the aforementioned parameters’ normalized weightage. All the four stakeholder groups cited the current cropping patterns, burning of rice crop residue, and imbalanced use of chemical fertilizers for change in soil health. However, the current state of soil health in Punjab is unclear, which needs further investigation based on temporal data collected from the same field to see the short and long-term
impacts of various crop combinations and varied cropping intensity levels on soil health.

Turientine, Whitney  
Graduate Student, University of Florida, United States, wturientine@ufl.edu

"Integrating gender considerations to ensure equitable access to climate information services in Tanzania"

In Sub-Saharan Africa (SSA), smallholder farmers, especially women, are increasingly vulnerable to the effects of climate change on their crops and livestock. In order to ensure that farmers are prepared for climate shocks and disturbances in the future, climate smart agricultural practices (CSA) must be implemented throughout the continent. One key way in which adoptions of CSA practices can be encouraged is through receiving climate information. In Tanzania, the CGIAR’s Research Program on Climate Change and Food Security (CCAFS) has started to roll out critical trainings for the country’s climate service workers in the Tanzanian Meteorological Agency to fine-tune forecast projections and climate information dissemination (Atakos, Tall, & Jay, 2014). In May 2014, “Tanzania’s national consultation workshop on climate services convened over fifty climate scientists, researchers, practitioners, farmers and national policy-makers from across the climate sensitive sectors (of agriculture, health and disaster risk reduction). They discussed climate service needs in the country; and agreed on a plan to scale up climate services for users” (Ibid, p. 1).

Key recommendations from the workshop included: “continuous identification of user needs for climate services; communicating available TMA products and services to users in relevant sectors; identification of bottlenecks in improved delivery of climate services; making policy recommendations to the steering committee for climate services; and consider appropriate mechanisms for developing climate services” (Ibid). In two communities, Kiteto and Longido, baseline surveys been conducted in 2014 and early 2015 considered farmers’ use, needs, and abilities to access climate services. Further investigation was necessary in order to better understand potential barriers and constraints for farmers (women and men) in accessing climate services. There was also a need to understand extension workers’ current perceptions of gender in farmer training sessions.

This summer, focus group discussions were conducted with farmers in the targeted communities to better understand gender-specific needs and barriers to accessing and utilizing climate information. Semi-structured interviews with previously trained and soon-to-be trained extension workers provided critical data to better understand the gendered dimensions of
climate service trainings in the country. Preliminary results on both the focus group sessions and interviews are presented in this poster.

Yildirim, Hacer  
MSc. Candidate, Bogazici University Institute of Environmental Sciences, Turkey, hacer.yildirim@boun.edu.tr  

"Lignin Recovery from Agricultural Residues for Waste Minimization"

Production of renewable fuels holds remarkable potential to meet the current energy demand of the world. Transportation sector is a significant contributor to greenhouse gases emission, accounting for about 23% of global CO2 emissions [1]. In this context, depleting natural resources, growing environmental awareness and economic considerations are the major driving forces to produce biofuels, especially bioethanol. Bioethanol from renewable resources, especially agricultural residue is a potentially viable alternative to petroleum-derived transportation fuel in terms of energy security, food security, waste minimization, green gas emission reduction and green chemical production.

All lignocellulosic residues consist of three major chemical components: cellulose, hemicellulose and lignin. After cellulose and hemicellulose, lignin is considered to be the most abundant natural polymer present on the planet and found in the range of 25-35 wt% of dry wood [2]. During the ethanol production, cellulose and hemicellulose turn to ethanol but while, lignin is removed from the system as waste. The remaining lignin can be utilized as a feedstock for green chemicals. The objective of this study is to recover lignin rich residues subjected to dilute acid/steam pre-treatment processes, and saccharification and fermentation process to produce green chemical; activated carbon after black liquor separation. The selected feedstocks—wheat straw and corn stover—are potential feedstocks for production of bioethanol due to their high carbohydrate content (nearly 50%) of nearly 37% cellulose and high annual production rate with almost 3.5 and 4.1 million tons in Turkey, respectively [3].

In this project, chemical activation and carbonization methods were used to produce activated carbon from lignin rich residues. For this purpose, lignin rich residues were impregnated with different H3PO4 / lignin ratios (30% and 50% H3PO4 concentrations) and then carbonized for 1 hour at different carbonization temperatures (400, 500, 600, and 700 °C) under 200 ml/min N2 flow. The optimum operational conditions were investigated by comparing yield, chemical recovery, and the surface area of the products. As a result, when the BET surface area of the products was compared with the commercial activated carbon, it was observed that the products are proper to be used as an activated carbon.
Utilization of by agricultural by-products creates an additional source of income for small-scale and family farmers. The more widely particular byproduct is utilized, the higher its value becomes, thus contributing to regional Sustainable Development Goal 2 and the related targets. Also, treating by-products as potential high-value feedstock rather than waste, creates alternative monetization options for farmers as well as new jobs. When the Goal 7 has been considered, utilization of waste biomass as a renewable fuel feedstock while environmentally sound, suffer from economic challenges, particularly in terms of cost of production compared to fossil based fuels.

References:

Yimer, Mohammed
Lecturer and Researcher, Arba Minch University, Ethiopia, mohammed.yimer@amu.edu.et

"The effect of sustainable land management to ensure food security; case studies from ANRS, Northern Ethiopia"

Nowadays, land degradation has emerged as a significant threat to the promotion of green economy, wellbeing of the ecology and ensuring food security. To counteract such a problem, Scaling up SLM technologies is a drastic solution. It is with this grand theme that this study was conducted in Tehuledere Woreda in three surrounding districts (Amumo, Kundimeda and Messal) taking the vulnerability of the area in to consideration. It shade light at identifying the factors hindering the adoption of SLM technologies and, the role of SLM technologies to ensure food security, and assessing the causes of food security in the context of SLM in the study area. The data used were obtained from both primary and secondary sources. The primary sources include structured questionnaire survey and focus group discussion methods. A total of 193 households were interviewed and their responses were interpreted. Scientific reports and conference proceedings were used to support the primary data. Descriptive statistics method was used for analyzing among farm land size, household, topography, erosion status and the adoption of soil and water conservation practices. The results indicated that farm land size, educational status of household head, slop of the farm land, lack of awareness, lack of adequate rain fall, financial constraints and
distance to the farm plot from household home were among the major factors that negatively influence adoption of SLM in the study area which resulted in food insecurity. Furthermore, applying cost effective technologies which are suited for different topography such as manure, stone bundles, check dams, planting trees, etc. are recommended to be adopted effectively to ensure food security. Finally, lack of rainfall, land degradation and soil erosion, small land size, and limited status of SLM technologies are found to be causes of food insecurity in the context of SLM. As land is the main stay of the life in rural areas, efforts should be exerted for successfully scaling up of SLM technologies.
Cities & Human Settlements

Attallah, Sherif
Assistant Professor, Ball State University, United States, soattallah@bsu.edu

"Comparative Evaluation of LEED and QSAS Credits using Life Cycle Analysis: Case Study from Qatar"

Implementation of sustainability rating systems for buildings had a recognized effect on the increased level of sustainability adoption in the construction industry. However, there is still a need for objective quantifiable evidence that the concepts adopted by the sustainability rating systems and implemented in projects lead to optimum positive impacts on resource consumption and the environment. The objective of this paper is to present research conducted to assess the actual environmental impact saved by implementing credits of both LEED (Leadership in Environmental and Energy Design) and QSAS (Qatar Sustainability Assessment System) using Life Cycle Analysis (LCA) approach. The impact of implementing LEED and QSAS credits under the categories of energy, water and urban connectivity on a selected project in Qatar was analyzed using LCA. The results of this analysis manifest the objective quantifiable benefits behind applying the respective sustainability credits and how the impact of an international rating system differs from that of a system developed for the specific region where the project is located. The relative weights allocated to these credits were also analyzed in light of the corresponding LCA results in order to evaluate the significance of such weights and how they can be reconsidered to achieve optimum savings of environmental impacts.
**Education**

**Khin, Nwe Ni**  
Professor, University of Yangon, Myanmar, nwenikhin15@gmail.com

"Promotion of Energy Science Education for Sustainable Development in Myanmar"

The 1st workshop of Official Development Assistance (ODA)-UNESCO project in collaboration with Vietnam, Laos and Cambodia on "Promotion of Energy Science Education for Sustainable Development in Myanmar" was held on 12th to 13th June 2014 at University of Yangon, in Myanmar. The 2nd workshop was held on 29th September to 3rd October at Kyoto University in Japan to discuss about localization and adaptation of the Course materials and curriculum of the Energy for Sustainable Development in Asia course developed by UNESCO COMPETENCE program. As one of the extension action, Kyoto University and UNESCO Jakarta Office started a new pilot project in collaboration with University of Yangon through ODA UNESCO program in Japan, in order to translate and localize the UNESCO COMPETENCE course into locally accessible and appropriate course in Myanmar. The 3rd Workshop of ODA UNESCO Project for verifying the content of educational materials was held on 18th to 19th December 2014 at University of Yangon, in Myanmar. The training seminar was held on 2nd to 5th Feb 2015 with about 100 attendees of local teachers, government officials and students. My presentation is the final outcome of the above mentioned workshops.

This course is designed to provide basic knowledge of sustainable development (SD) and its important roles to achieve Millennium Development Goal (MDG) related to Myanmar. The course was intended not only for academic environment, but also intended for grass root level. Hence, it was prepared in English and Myanmar.

Sustainable development part will cover definition of SD, Milestones related to SD, SD Models, MDG and its Eight Goals with targets. In Energy Access and MDG part, I have emphasized on Important of Energy Access related to MDG and Definition of Energy Access. Key issues of energy, renewable energy, sustainable energy and energy options were included in the course. Energy access to energy services and transition to renewable energy in rural area were examined. In the Status of SD in Myanmar part, I will explain on energy sector policy, framework and strategy in Myanmar, National Sustainable Development strategy (NSDS) and National Commission on Environmental Affair in Myanmar. I will cover present government planning for rural electrification programme. In Myanmar achievement on Energy access and MDG part, I will start explaining energy access in Myanmar and some ASEAN
countries. Feasible study on renewable energy in Myanmar will also be covered. Energy production, consumption and supply in Myanmar will be explained here. I have included some photos related to solar power utilization for village electrification and rural livelihood improvement in Myanmar. Finally, I will cover Success and challenges, conclusion and references.

My presentation was concluded with Questions and Discussion session. Questions such as: How do we try to achieve SD? How to decide to choose suitable energy options for Myanmar? etc. Status of Sustainable Development in Myanmar for discussion. I got many answers from students and discussions from participants. In this paper, some of them were mentioned. It showed good responses have been achieved from the attendees.

**Premji, Sabrina**  
Co-Founder & Chief Exploration Officer, Kidogo, Kenya, sabrina@kidogo.co

"Kidogo: Providing Early Childhood Care & Education in East Africa"

While 85% of brain development takes place before age 5, early childhood development (ECD) continues to be neglected in developing nations, with approximately 200 million children globally failing to reach their full potential. In Sub-Saharan Africa, only 12% of children have access to formal Early Childhood services. For children living in infrastructure-poor slums who face extreme poverty, neglect & poor health, access to ECD services is virtually nonexistent.

Kidogo is a social enterprise that provides high-quality Early Childhood Care & Education in East Africa’s informal settlements for less than $1 per day through an innovative “hub & spoke” model. Kidogo builds & operates best-practice community ECD “hubs,” which provide young children (6mo-6yrs) a holistic ECD intervention including a safe & stimulating physical environment, nutritious meals, a play-based curriculum and well-trained, supportive caregivers. In addition, Kidogo partners with local “mama-preneurs” through a micro-franchising model, providing training, materials & ongoing support to start or grow their own local childcare “spoke” using a business-in-a-box approach.

Kidogo currently operates 2 “hub” centers – one of which achieved operational break-even within 8 weeks of opening – and has partnered with 6 mama-preneurs, providing over 200 kids living in Nairobi’s urban slums the right start to life. They have embarked upon a rigorous case-control research study in collaboration with the Aga Khan University to understand the impact of their intervention on the physical, cognitive, psycho-social and
language development of children attending Kidogo’s hub and spoke centers, as compared to a control group.

Kidogo’s sustainable and scalable ECD model, which focuses on the holistic development of the whole child, represents an interesting perspective on the role of the private sector within the post-2015 Sustainable Development Agenda. Additionally, Kidogo’s growing list of partners, including Grand Challenges Canada, IDEO.org, USAID, Aga Khan Foundation, DFID and the County Government demonstrate the power of public-private partnerships to create systemic change.

Kidogo’s goal is to unlock the potential of young children, empower mama-preneurs, and transform the trajectory of families living in informal settlements.
Ending Extreme Poverty

Mohd Nor, Radieah
Lecturer, Universiti Sains Malaysia, Malaysia, radieah@usm.my

"Implementing the Sustainable Development Goals (SDGs): Getting Started - Ending Extreme Poverty From Malaysia Experiences"

During the first independence from the British in 1957, Malaysia is still among the developing countries. However, the World Bank has listed Malaysia has achieved a 1% rate of poverty in 2014. It shows a remarkable achievement when it registered a decline of 48.3% in 1970 because the incidence of poverty was 49.3%.

Malaysia’s experience there are a variety of programs that had been implemented by the federal government to address the problem of poverty in Malaysia of which is to establish the Federal Land Development Authority (FELDA) to meet the needs of the population, which was launched on 1 July 1956. Through FELDA, some people were selected to acquire a piece of land with a house to live in. However, on January 1, 1990 the government decided to stop the recruitment of settlers. This is done so that the dismissal of the government can focus on enhancing existing FELDA’s infrastructure areas so that existing facilities along with the development of infrastructure in the city.

The Malaysian government has also introduced Malaysia Government Transformation Programme (GTP) in order to raise the standard of living in order to achieve a developed nation by 2020. Through this GTP Key Result Areas (NKRA) was definitely aimed at improving the socio-economic Malaysians. There are seven things through a key pillar of the demands of the people as reduce the cost of living and also strengthen public services. The seven pillars are intended to reduce crime, combating corruption, ensuring quality education, raising living standards of low-income households, improving rural development, improving urban public transportation and addressing the cost of living. However, areas that do not embrace the NKRA are considered important by placing them under Ministerial Key Result Areas (KRA).

Among the key programs under the NKRA to have recorded success. The ultimate goal is divided into two. First, to provide immediate assistance to those in need. Second, to ensure that the poor and hardcore poor build with full support so that they are able to be independent. GTP in the first phase or GTP 1.0 has highlighted 1AZAM 1.0 (End Poverty Ages) has seen significant results, but generate important lessons in delivering assistance. To improve the program, the second phase of GTP introduced. It is known as GTP 2.0.
Through GTP 2.0, government continues to be committed to empower the poor so that they are free from poverty.

Through 1AZAM, the government also seeps microcredit program with joint venture Amanah Ikhtiar Malaysia (AIM) in the program. The same concept was introduced by Muhammad Yunus of Grameen Bank, Bangladesh to withdraw its citizens from poverty. The aim is to give to the poor concentrate in women than in men.

Overall government attention to empowering citizens in the socio-economic make Malaysia managed to reduce the incidence rate of poverty to 1% in 2014. The programs had been implemented by the government can be adapted by lower income countries so that these countries can continue live life without poverty.
Financing for Development

Rais, Omar
Graduate Student - MDP Program, University of Waterloo, Canada,
okrais@uwaterloo.ca

"Women's Empowerment and Microfinance in Pakistan"

Pakistan has received more than $20 billion in foreign development aid but this aid has made little advancements in social well-being for the population it was addressed for. Political stability and economic well-being in Pakistan have reached new lows and as the faith in the elected government waivers, so does the law and order situation in major cities like Karachi. However, Pakistan continues to persevere with the strength of its people who continue to engage in civil society, achieve excellence in academia, participate in social movements, develop innovative ideas, and are recognized on a global scale. One key issue that surfaces in the debate around foreign aid is the status of women in Pakistan; how can aid challenge the gender divide that exists in the country? The answer I propose is three-fold. First, we must explore the failed projects of international development in Pakistan and discuss how women are being excluded from the development process. I argue that Western-based ideals of development tend to ignore the culturally-constructed gender roles and responsibilities which contributes to their failure. Second, the type of aid must be analyzed in order to prevent further redundant projects from taking root. In parts of South Asia, particularly Bangladesh, the field of microfinance has emerged as a tool to combat economic deficiency among the poor. With the proliferation of microfinance organizations like BRAC and Kiva, microfinance has piqued the interest of many aid organizations who are trying to adapt the model in their own development activities. One of the key targets of microfinance is to alleviate poverty among women. I observe the growth of microfinance in Pakistan and evaluate whether projects being implemented in Pakistan are effective in meeting development targets. A closer look will also provide constructive criticism on the microfinance sector since it juxtaposes it to the political and social turmoil in Pakistan. Finally, this paper tracks the recent trend of entrepreneurship and suggests that self-employment can empower women to challenge the gender divide in both, rural and urban settings. This is not an easy argument to make and it certainly has been made before however, I look at specific examples where microfinance, coupled with self-employment has significantly impacted culturally-constructed gender roles. I also address the critique of microfinance which raises questions about its sustainability. I argue that locally-based microfinance organizations can continue to engage with the women in order to continuously enhance their skills-set. Furthermore, I suggest that in order to tackle fundamental economic disparity between men and women in Pakistan, the government must adopt
policies that encourage the growth of microfinance and entrepreneurship. This paper does not make any claims to a universal solution to tackle gender inequality, rather it provides a critical analysis on a trend that has gained significant attention and apply it to the specific context of Pakistan’s urban and rural areas.
Governance (Including Peace Building & Justice)

Bizenjo, Waleed
Research Associate, Chief Minister’s Policy and Reforms Unit (CMPRU), Pakistan, bizenjo@hotmail.com

"Enabling Rural Education"

Balochistan has the lowest literacy rate of 25 percent and a very alarming education situation. According to the statistics, an estimated 70 percent of young children remain deprived from the right of education in the region. Apart from several social, economic and political reasons, the unique demographics of Balochistan also play a role in this regard. Half of the present schools in Balochistan have one-two classes due to the very low-density of population. Poor infrastructure, deserts and rugged mountains with small pockets of settlements fragment majority of the area from rest of the country. Poor communication lines and long distances between the settlements make it difficult to have access to children and monitor the standard of current schools.

On the other hand, the modality of Balochistan’s education system is inherited from the 19th century, which is unproductive, defected and outdated. The education sector of Balochistan needs viable reforms on emergency bases. CMPRU is taking the initiative of introducing Information and Communication Technologies (ICT) for effective learning in the region, which can help overcome many of the faced challenges and bring revolutionary changes in the education system of Balochistan.

ICT’s is one of the rapid development technological fields in the world, it facilitates school leaders and teachers to prepare students for the demands of ever-changing world, through facilitating learning in a technology-learning environment, where students and teachers don’t just learn about technology, they use it to achieve powerful learning and teaching and improve learning outcomes. Furthermore, Digital media will also enable the Government to motivate and educate parents and communities in rural Balochistan.

In-order to develop a workable technology based communication system; the Government will need to develop head quarters in at least five major districts of Balochistan. Headquarters will monitor the performance of schools and constantly train and develop the skills of existing teachers. However, the headquarters will need to be facilitated with required technology like laptops and desktop computers, projectors, multifunctional printers, sound recording systems, UPS and electricity generators, digital cameras and LCD screens. Furthermore, power can be supplied to schools through the installation of solar producing energy system. To enable digital learning,
schools need solar power for electricity, computers with Internet connection where possible, LCD screens, audio and video players and electric tablets specially designed for children of different classes with long-lasting batteries. Electronic tablets are way more efficient and cost effective in comparison to books, which can be designed within the country and ordered from labor-intensive countries like China. Experts in the field of education need to be hired to develop productive courses for the primary education sector. However, this process needs constant testing, monitoring and development for meeting the ever-changing demands of education. On the technical side, a team of technical/computer experts needs to be engaged for the implementation of this process. An innovative project team with diverse expertise in different fields is vital for the accomplishment of desired results.

Dhas, Nirmalan
Director - Research, Communication and Global Networking, The Foundation for Civilizational Transformation and Conscious Evolution, Sri Lanka, mentor@slt.lk

"Sustainable Development Practice for Homo Sapiens: A Matrix for Process Generation"

Non-hydrocarbon sources of energy, the de carbonization of the atmosphere and hydrosphere along with the re carbonization of the biosphere and geo-sphere are a few elements belonging to a complex developmental matrix generated by a perceptual paradigm that is entering the awareness of certain individuals within the species Homo sapiens. In this paper I set out this matrix to the extent that it is currently perceivable by myself, my associate and my collaborators and on its basis describe some of the actions that may come together to form processes that may support the emergence of a sustainable and credible future. The paper establishes that the species is evolving the capacity to manage its own evolutionary processes and guide earth processes as well.

As currently envisioned this matrix contains seven (7) vertical tracks [wind down | substitution and transformation| preservation and archiving | research and development | financing | guidance administration and monitoring| timeline] ten (10) horizontal tracks consisting of the resilient and sustainable social support and species survival systems and supply chains (R7SC), four (4) horizontal tracks consisting of the global processes of environmental repair, rehabilitation, regeneration and development (GPE3RD) and four (4) currently perceivable objectives at species, planetary and cosmic spatio-temporal levels. It is offered to the species Homo sapiens as a framework that may help generate a felicitous future.

Cloud computing solutions along with software for the processing and management of big data and powerful hand held devices that can access
Presenters are listed first followed by additional authors. Contact information is for presenters.
projects. The objective is to develop policies and design services that effectively respond to citizens’ needs, and are relevant to their individual circumstances.

In this regard, citizen engagement represents a means through which governments and public institutions can implement inclusive and participatory policies that enable all segments of population to shape and contribute to the decisions that affect their lives.

Governments can rely on the steady development of Information and Communication Technologies (ICTs) to connect more actively with citizens and engage them in the public affairs and development arenas. Crowdsourcing and social media are samples of platforms that offer an opportunity to foster such active citizen participation and inclusiveness by:

- Opening and democratizing the processes of public policy making and public service delivery so that citizens can contribute their insights and ideas to solve national, regional, and local issues that affect their daily lives.
- Providing a better understanding of citizens’ demands and expectations so that services and policies respond effectively to relevant circumstances.
- Establishing development priorities based on citizen insights and recommendations.
- Fostering social innovation by opening up possibilities for all members of society to contribute their ideas and solutions, regardless of their gender, age, race, religion, geographical location or any other background factor.

Without the active engagement, inclusiveness and participation of all citizens, development goals such as poverty alleviation, the generalization of basic education, or the assurance of gender equality can hardly take place and even if they do, they will not be sustainable.

**Masaki, Katsu**  
Professor, Hirao School of Management, Konan University, Japan,  
masakik101@gmail.com

"Exploring Bhutan's Democracy: In Search of a "Good Governance' Approach to the Promotion of Sustainable, Equitable Development"

Bhutan's Gross National Happiness (GNH) has been attracting attention among those endeavoring to conceptualize a new paradigm of development, at a time when the world is getting skeptical and wary of models of
development that solely focus on material well-being. At the heart of GNH is the view of well-being as emanating, not only from material goods, but also from emotional and spiritual well-being that is closely tied with social harmony and peace. This paper draws on fieldwork that the author conducted in 2011-14, and examines how this GNH vision is reflected in the country’s political reform to start parliamentary democracy through the promulgation of the constitution in 2008. Bhutan has chosen a unique ‘middle path’ approach to democratization; it has complied with the global standards to adopt universal suffrage, multi-party election, and bicameral legislature, while contravening the liberalistic orthodoxy of rendering the state as a neutral arbiter that refrains from according a special status to any particular leader or religion. The constitution stipulates that the monarchy and Buddhism shall serve as moral authorities constraining the arbitrary use of governmental power and nurturing associative bonds in society. These ostensibly ‘illiberal’ provisions throw a critical light on the predicament facing many of today’s ‘advanced democracies’, where political power tends to get concentrated in the hands of privileged elites with money and influence, in the absence of a focal point that nurtures social cohesion bound by mutual obligation and trust; ‘advanced democracies’ are liable to suffer from the proliferation of development practices that are not only ecologically unsustainable but often result in social and cultural degradation. While the Bhutanese state is not entirely exempt from similar issues, they have been dealt with, with recourse to the monarchy and Buddhism. If and when deemed necessary, the King issues a directive to rectify a governmental decision that is likely to conflict with the main pillars of GNH, namely, environmental conservation, the preservation of culture, and sustainable and equitable socioeconomic development. Moreover, possible excesses that may arise among political leaders have been prevented, given that they are normally guided by the Buddhist tenets of humility, wisdom and compassion. The one-of-a-kind, GNH-based democracy thus rests on the monarchical authority and Buddhism, both of which represent vernacular democratic values in Bhutan. The case of Bhutan’s democracy can serve as a source of inspiration for those who explore types of a governance structure that is conducive to the promotion of an alternative paradigm of development leading to wholesome physical, emotional, and spiritual well-being.

**Owolabi, Abimbola**
Alumnus, Center for Sustainable Development, University of Ibadan, Nigeria., Nigeria, owolabisnr@gmail.com

"Weak Leaderships and Institutions: the Bane of Sustainable Development in Sub-Saharan Africa."

One might say, of course, that leadership matters everywhere. But in Africa more than anywhere else in the world, the difference that just one good and
strong leader can make is much greater than anywhere else. This is because in Africa, we have weak institutions like the constitution, the three arms of the government such as the legislature, the executive and the judiciary, military, the police, the civil societies and above all, the complacent and gullible followership.

When societies have strong institutions, the difference that one good leader can make is limited, but when there are weak institutions, then just one good leader can make or break the country.

Meanwhile, if there is any single enterprise sector in Africa that has crashed today, perhaps irredeemably, it is the leadership. Apparently, to be a leader there must be the thought, the thinker, and the thought is the foundation upon which all other qualities of a good leader are built. Leadership is about prophecy and prophecy is not foretelling the future, but a mere projection of the future based on present realities as we see them. Acquiring these tools and platforms for forecasting or mapping the future is an inevitable characteristic of a good leader.

Unfortunately, Africa has been riddled with weak leaders without knowledge and vision but live in the darkness of their ignorance. Incidentally, the development of nations and peoples are the works of their great minds, their leaders and not tinkerers or professionals. It is the enthronement of knowledge as the highest capital and asset of a people. When a system is led by visionary, selfless individuals, with strong institutions, development will always manifest. In this broadest context, one can say that self-control and sacrifice for the common good are aspects of integrity, which is central to good leadership and governance.

With enormous resources at its disposal, undoubtedly, it is possible for Sub-Saharan Africa to be the region of the future, but unfortunately, the region remains in poverty because successive leaders have made it a theatre of lamentations with poor governance and lack of accountability. The region has no doubt suffered failures occasioned by poor leadership, lack of political will to drive ideas, resource management and on top of it, corruption. These have in no small measure affected the socio-political and economic development of the region.

In the light of the problems highlighted above, this paper is able to evaluate the roles of good leaderships and strong institutions in the attainment of sustainable development and the need to build strong and virile institutions for the region to improve its socio-economic performance and be able to favorably compete in the 21st century globalized world. It goes further to identify some of the challenges the region might face in the process and seeks to proffer possible solutions to overcome them and move the region forward.
Oyebanji, Omotoyosi
Youth Project Officer, Voluntary Service Overseas Nigeria, Nigeria, toyosi.oyebanji@yahoo.com

"Youth participation in governance, a tool for nation building, case study of Ikorodu Youth Parliament, Nigeria"

This paper examines the problem of youth participation in governance in Nigeria. Nigeria is the most populous African Nation; according to the 2006 census, the country has over 100 million young people. It is however saddening that even with this high number only over 5 million youths have been involved in any level of governance, usually at the community level (64.9%) while 30.9% are involved at the ward level and 1.6% at the State level. The non-participation of the young people in Nigeria cuts across other vital sectors such as the civil service and the educational sector.

The paper also highlights the Nigerian cultural context to the non-participation of young people in governance. Questions that come to most minds are; Are the youth not good enough? What could be the cause of young people’s apathy towards Nation building? Available survey results showcase a lack of belief in the educational system: a system in a state of near collapse that offers access to education without quality and does not equip the youth with life skills. Furthermore, this paper points that the establishment of a Federal Ministry of Youth Development in January 2007 in realization of the growing significance of Youth to national development has made little impact on the Nigerian Youth. Results from a survey conducted reveals more on the situation of young people in Nigeria in the areas of employment, education, health, sports, political and governance, security, migration, and religion amongst others would be further discussed in this paper.

Lack of participation has a negative effect not only on the youth but especially on the economy as an emerging nation. It buttresses the fact that a system with all strategic positions in the hands of the few aged would be static, highly traditional, exclusive, obsolete, rigid, and not 21st century compliant. The main natural resource of Nigeria contrary to popular belief is Youth because oil has a lifeline while young people will always exist, hence a term that would occur often in this paper, “youth NOT oil”. The paper further examines reasons for exclusion of the youth in decision making processes, governance and subsequently peace building. The paper outlines the reasons for a growing sector of disoriented youth who feel they do not owe the country anything by being law abiding.

The paper however gives a solution to how the youth can be actively involved. Young people need a safe platform to demand social accountability and inclusion. An example of such space is the Voluntary Service Overseas’
Youth Action Nigeria promoted Neighbourhood Youth Parliament inspired by India’s Neighbourhood Children’s Parliament. The model recognizes youth as a tool for development utilizing enabling spaces; community or neighbourhood parliaments, a grass root development approach which if replicated around the country will make the youth 21st century active citizens, give them a sense of belonging, contribute to peace-building, and enhance social justice. Hence, creating such spaces should be a key goal of the Sustainable Development Goals (SDGs) to allow young people be actively involved.
Health

Kristensen-Cabrera, Alexandria; Eddy Perez-Then, Vania Smith-Oka
Student, University of Notre Dame, United States, akristen@nd.edu

"Factors Associated with the Practice of Breastfeeding for Mothers who Attend the Dr. Robert Reid Cabral Children’s Hospital in Santo Domingo, Dominican Republic"

Exclusive breastfeeding rates in the Dominican Republic are the lowest in all of Latin America. In Latin America 37.9% of mothers’ breastfeeding exclusively for the first six months while in the Dominican Republic the rate is only 7.8%. Breastfeeding is critically important for maternal and child health. Optimally breastfed children are 14 times more likely to survive than those who are not breastfed.

The objective of this study is to describe the factors that limit or favor the practice of breastfeeding for mothers who attended the Robert Reid Cabral Children’s Hospital.

A cross-sectional, descriptive, and observational study with a random sampling method was used to select 60 Dominican mothers over the age of 18 who live in Santo Domingo, Dominican Republic. Data were collected with a semi-structured interview questionnaire in July 2014. Qualitative and quantitative data was analyzed using SPSSv22.

For this data set, the average length of exclusive breastfeeding was 2.34 months and average length of breastfeeding partially (child receives breast milk and food) was 7.36 months (close to national averages). Factors significantly associated with not practicing exclusive breastfeeding longer than 2 months include working full time (OR=5.7, p=.012), lack of correct information regarding breastfeeding (nutritional value of breast milk, OR=10.86, p=.0008), and lack of support. 87% (52/60) of mothers stated that they did not receive any breastfeeding support. Breastfeeding support, correct information regarding breastfeeding, and work status were the factors significantly associated with exclusive breastfeeding for this sample. These factors should be targeted in culturally appropriate breastfeeding interventions such as a community-based breastfeeding support group spanning pre and post-natal periods.
Lam, Phoebe
Student, University of Waterloo, Canada, pcy2lam@uwaterloo.ca

"Pathways to Maximizing access to water, sanitation, and hygiene in Ghana"

Development efforts in the Water, Sanitation and Hygiene sector (WASH) to improve access and education remains to be of utmost importance as a key public health concern. By increasing access to safe water, adequate sanitation, and hygiene practices, it forms the pillar of foundation for other development goals such as improvements to health, reduction of health risks and spread of diseases, education, poverty reduction, and socioeconomic development. The importance of the WASH sector was highlighted in the Millennium Development Goals under sustainable development with the target to half the proportion of the population without sustainable access to safe drinking water and basic sanitation. The goal has been achieved for safe water access; however the targets for sanitation and hygiene are still off track. Low access to water, sanitation, and hygiene services will lead to child mortality and exasperate poverty. Poor WASH services available to the public increases the likelihood of transmission of other diseases and creates consequences that can spillover to the economic sector, place limitations on education, and impedes the progression of gender equality.

Significant progress has been made since the 1990 MDG baseline year with improvements in access of drinking water, sanitation, and hygiene education initiatives. However, there are today, 748 million people who rely on unimproved sources of drinking water, 2.5 billion people who lack access to improved sanitation, and 1 billion who practice open defecation according to a report by UNICEF. Building on the MDG to expire in 2015, the agenda on the new Sustainable Development Goals as will continue to uphold efforts in the WASH sector as priority.

Ensuring the means to a healthy and productive life through access to clean drinking water and sanitation are crucial to the realization of human rights. This paper plans to explore the interconnectedness of water, sanitation, and hygiene individually and its effects on health as a whole. Using the example of Ghana, a critical analysis on the WASH sector will be conducted in relation to the Sub-Saharan Africa region, which has been identified as a priority region requiring improved WASH services. In Ghana, inadequate access to waste disposal points has forced urban dwellers to resort to dispose of their waste into gutters and drains. Waste disposal infrastructure such as sewage, solid waste systems still remains to be an issue. Dependency on unsafe water sources remains high in rural regions. In addition to examining WASH as a sector, this paper aims to understand the institutional challenges that hinder efforts to reach sanitation goals and then target solutions to spearhead efforts against those challenges. These challenges include a lack of access to sanitation services and insufficient financing. Depending on the rural or
urban circumstances, different challenges are faced regionally and a concerted effort from a regional and national level is necessary to combat this pressing need for improved WASH services.

Sarfraz, Muddassar; Shuangqin Liu
PhD Candidate, Hohai University, China, muddassar@hhu.edu.cn

"Environment change, health, and sustainable development in People's Republic of China"

This paper seeks to identify effects of environmental change and health in China sustainable development. Due to fastest growing economy and population size, it plays vital role in the environment change. “How environmental change effect can be reduced on health and sustainable development can be achieved”? Is it possible for China “innovating to zero”? After the United Nations conference on environment and development 1992, Chinese governments publish agenda 21 on Environment development and Population. Chinese government considered environmental protection as a basic element of national policy. Country with the population of more than 1.4 billion and due to rapid economic growth from past few years, is suffering now from key challenges regarding sustainable development. Poor health conditions due to climate change are one of the main causes that lead society towards unsustainable development. Because of poor nutrition, people have to suffer from diseases, they have to be hospitalized which results in less working hours and loose of financial resources.

In this conceptual paper, to achieve its purpose, environmental change and health literature review approach is used. It will be consider as a basis for the formulation for new approaches towards sustainable development.

Government has implemented key policies in order to reduce the impact on climate change on health. Rapid economic growth in short span of time with limited resources has some limitations. In developing countries, sustainable development is considered more vital than developed countries. There are some serious challenges unless valuable efforts have been made for sustainable development. Quality of life standards, aging of the population is accelerating; the social security system is inadequate, basic medication facilities, employment opportunities, green energy share is less as compare to other energy resources, developing infrastructure are key challenges for sustainability. Different factors social, economic and political act together to have impact on climate and environmental change. Awareness should be spread out among societies.

Government should focus more on the climate changing issues by implementing “Good Governance” policies. The factors those are major cause
and have strong impact on the environmental changes (economic-social) should be taken under key consideration. Renewable energy resources, reduction in CO2, Good Governance, providing basic health faculties, rule and law, creating job opportunities by economic development will be key steps towards sustainable development.
"Sector market analysis for inclusive economic development in Peru"

The United Nations sustainable development goals for poverty alleviation have identified women and youth as vulnerable and marginalized groups within the market systems of developing economies. The economy in Peru has multiple strong sectors with potential for sustainable economic growth. Some of Peru’s strong economic sub-sectors are coffee, cacao, and tourism and hospitality for which it has become recognized. Tourism is the country’s third largest industry. All these sectors provide women and youth with valuable economic opportunities; however, these sectors are not being used to their full potential due to limited access for women and youth. Women often complete unpaid work in various areas and experience limitations due to a lack of access to education and productive resources. The current education system does not respond to the needs of employers and results in youth underemployment caused by a lack of acquired skills and preparation. There are deficient employment and entrepreneurship opportunities. There is potential to locate more economic growth opportunities within the agro-industry and tourism sectors. In line with the sustainable development goals, the following research falls under the theme of inclusive economic growth for these two sectors in Peru.

The objective of this research is to assess the capacity of the agro-industry and tourism sector to contribute to sustainable economic growth in Peru with a focus on the economic empowerment of women and youth. There will be an analysis of current standings of the above-mentioned economic sub-sectors through the use of a market systems approach. The market system analysis ultimately aims to create power and agency, which benefits time management, decisions, and builds confidence; as well as provides access to resources like training, work opportunities, and earning improvements.

This approach is used to obtain findings on the current capabilities of women and youth in the Peruvian markets. First, in a market analysis current limitations that are identified and root causes for the limitations are explored. Next, it gathers and analyzes information to establish effective points of intervention. The discovery of these interventions can be used for designing a systemic change through developing plans and through the implementation of sustainable goals. Methods are discussed of building capacities and competencies of institutions to work together in the creation of open lines of communication. This is in efforts to further develop the sub-
sectors for improved and more inclusive services. The results of these findings identify key opportunities and hindrances for women and youth within the Peruvian economy. The findings show that there is a need to train and prepare women with skills that allow for them to rise to managerial levels and to be actively involved in current markets. The results of this paper provide a strong basis for the development and implementation of sustainable development goals that will allow for Peru’s economy to grow in a way that is inclusive to women and youth.

Chowdhury, M. Jahangir Alam  
Professor and Executive Director, University of Dhaka, Bangladesh,  
mjac_dubd@yahoo.com

"Access to Microfinance and Women Entrepreneurship: Evidence from Bangladesh?"

This paper intends to assess the impact of the participation in microcredit programs on women entrepreneurship in Bangladesh. The women entrepreneurship has been defined as the ownership of enterprises by women. The descriptive statistics and multivariate techniques have been used to achieve the objective of the paper. The study uses Household Income and Expenditure survey (HIES) 2010 data set. HIES 2010 survey covers 12,240 households from all districts in the country. Considering the endogeneity in the microcredit program participation of women, the study uses instrumental variable technique (IV method) for assessing the impact of the microcredit program participation on the entrepreneurial status of women. After the adjustment of the endogeneity, the results from multivariate analysis indicate that access to microcredit has a significant positive impact on women entrepreneurship. It has also a significant positive impact on men entrepreneurship and it is more effective for men entrepreneurship than women entrepreneurship. Against the backdrop of the information that 93 percent of microcredit programs members in Bangladesh are women, these results highlight that the majority of these women members do not use their microcredit loans for owning businesses. Rather, they pass those loans on to their household male members. So, it is evident from these results that access to microcredit does not help the majority of women in starting their microenterprises. Therefore, it is important for the policy makers in the government and the microfinance sector in Bangladesh to reconsider the existing technology of giving microcredit loans to women. The redesigning of the microcredit technology is necessary for enabling women to use their microcredit loans for owning microenterprises.
"Corporate Social Responsibility and Sustainable Development; an organizational perspective"

The purpose to study is to explore the relationship between corporate social responsibility (CSR) and sustainable development. It will also examine “how CSR play its role in the development of society”? Corporate Social Responsibility (CSR) is a widely used business strategy in customer-oriented markets. Numerous companies use various socially responsible strategies to attract more consumers, by triggering their compassion for various social causes. The concept of corporate social responsibility has been characterized as elusive (Smith & Langford, 2009), broad and complex (Mohr, Webb, & Harris, 2001), malleable (T. Devinney, 2009), and blurry and fuzzy (Geoffrey, 2001). The basic idea behind it is straightforward: Corporations are responsible for more than simply making a profit (Godfrey & Hatch, 2007).

CSR practices vary from country to country. In developing countries, it has been observed that CSR has gain more attention rather than in developing countries. Bangladesh is a developing country and its economy is based on different key sectors. Education, rule and law, Governance and political systems considered as key challenges in the country. There are different viewpoints regarding the types of CSR programs and policies that are used in response to different social and environmental issues, and whether or not there should even be a response by companies (e.g. Friedman) (Lantos, 2001; Carrol, 1979; Porter and Kramer, 2006; Googins et al., 2007). There is less awareness among the people about CSR and government has no specific rules and regulations for the implementation of CSR. Thus, only limited organizations are promoting CSR activities and with the passage of time, CSR is gaining more attention in the country.

In this study data was collected through semi-conducted interviews from the different sectors organization, operating in Bangladesh. For interview purpose, 30 managers were approached but 23 managers availability was possible. Data was examined to identify the role of CSR in sustainable development, does it has any role or not? If organizations starts promoting CSR activities then what will be its impact on the society?

Study shows that CSR is playing vital role in the sustainable development of society. Various CSR activities are going to be done by organizations and gaining more attention in society. Managers are strongly committed to play their role in the development of society. But still some challenges exits, environmental and social challenges need more consideration. Study also throws light on responsible business practices and sustainable development.
By promoting CSR and more awareness among society will be more beneficial for the sustainable development of organizations itself and country. Bangladesh is located in South Asia and it has valuable geographical importance. Sustainability of country is beneficial for whole region, so it has regional impact.

**Mosugu, Tegan Joseph**  
MPA-MS Dual-Degree Candidate, New York University, USA, teganjmosugu@nyu.edu

“The Economic Pendulum: China-Africa Relations”

China is the fastest-growing economy in the world, and its influence on the global and political stage is stronger than ever. Today, it is Africa’s largest trade partner. This research paper explores the effects of the Forum on China Africa Corporation policies in Africa using Zambia as a case study with a special emphasis on its mining industry. We found that China’s investment has grown dramatically on the African continent and expeditiously in Zambia. Despite significant growth, we observe this growth is camouflaged with Chinese absolute trade advantage and humanitarian woes.

**Owolabi, Abimbola**  
Alumnus, Center for Sustainable Development, University of Ibadan, Nigeria, owolabisnr@gmail.com

"Growing Small Businesses: an effective and strategic policy to accelerate socio-economic development in Nigeria"

“Small businesses are the backbone of our economy and Conservatives are behind them 100 per cent. We are the party of the grafters and the roofers and the retailers and the plumbers. We get them, we respect them, we understand them and we back them”. These are the words of David Cameron, the Britain’s Prime Minister of the Conservative Party that captures the importance of the small businesses to an enviable economic position.

With ample avenues for wealth creation and expansion, personal economic empowerment and profit-making, the focus on growing small businesses has the potential of fostering genuine economic security.

In terms of replicating the UK success story in Nigeria, the Bank of Industry (BOI), the Subsidy Reinvestment and Empowerment Program (SURE-P), Youth Environmental Empowerment Awareness (YEEA) program, Small and Medium Enterprises Development Agencies of Nigeria (SMEDIAN) and their likes catering for the needs of small and medium scale businesses were created.
However, as a one-stop shop for industrial development and economic empowerment of the grassroots, each of these agencies, with their activities are showcased online with powerful image laundering acts, the claims made often seem far from reality.

Consistent with a philosophy that genuine economic growth must be reflected by the quality of life of the people, rather than in the pedantic clichés of public officials and reports of government agencies. It is the conviction of this paper that those agencies which should be arrowheads for economic development are not really functioning the way they should.

This paper seeks to address the varied issues involved in small businesses in Nigeria and the challenges confronting the various agencies established to address them. Such issues as lack of access to finance, poor management skills, inadequate training and education among others contribute to low business growth and failure. Consequently, the agencies are contending with problem of poor statistical data, technical personnel and bureaucracy, which are responsible for inefficient policy implementation.

It goes further to find out why the benefits to be accrued to the functions of these agencies are not percolating to the grassroots who are the original targets for their establishment.

Finally, the paper tries to proffer attainable solutions to solving the problems which ranges from getting the statistics of functional small-scale businesses in Nigeria, organize them in terms of size, structure, future and thereby make projections on their job and wealth creation potentials.

**Studer, Isabel**
Program Director & Founding Director, Global Institute for Sustainability, EGADE Business School, Tecnológico de Monterrey, Mexico, [isabel.studer@itesm.mx](mailto:isabel.studer@itesm.mx)

“Mexico: Program for MSME Competitiveness through the Implementation of Sustainable Practices”

SMEs, Anchor Companies, and Sustainability: Small and medium-sized enterprises are key contributors to the emission of greenhouse gases (GHG). Siemens, Mars, and Calvert worldwide. Anchor companies recognize that most emissions occur at the first and last parts of the value chain. According to Siemens, only 6% of the total emissions of their products are under the control of the anchor company; 80% of the product value chain’s emissions come from the first SMEs in the chain.[i] The cumulative effects of poor environmental management and the importance of SMEs in the Mexican economy[ii] suggest a huge environmental impact from SMEs in Mexico.
Notwithstanding, there is very little information available about environmental management for SMEs in the country, nor is there available baseline information sector-wide.

Under shareholder and management pressure, large corporations in Mexico, such as Walmart and Femsa, are increasingly analyzing not only the sustainability of their core operations, but also that of their SME supply chains. For example, Walmart requires its suppliers to complete a Sustainability Assessment, ranking firms based on their scores, which is one input into their buying process. SMEs without any environmental management systems receive low scores, and are thus less competitive than peer suppliers. Other large firms in Mexico, such as FEMSA, are recognizing the value of working with their suppliers in order to green their supply-chain and reduce their ecological footprint, including their GHG emissions.

Context in Mexico: Like many other countries, Mexico is instituting policies to promote sustainable consumption and production practices. Many of these actions have been undertaken under the Marrakech Process, an action campaign that began in 2003 to encourage production and consumption patterns that help decouple economic growth from environmental degradation. Mexico has already defined a preliminary version of the National Strategy of Sustainable Production and Consumption that aims at improving the efficient use of resources and toxic materials as well as the reduction of waste and carbon emissions.[iii] Other government efforts that are more specifically oriented to improve the energy efficiency of SMEs include the joint program of NAFINSA and the Ministry of Energy, which offers credits up to 20,000 US dollars for substituting light-bulbs or refrigeration and air-conditioning equipment with more efficient ones.[iv]

In spite of these and other government efforts, one of the major challenges facing countries like Mexico is to find effective ways to train smaller companies in the adoption of sustainable practices. In contrast with the situation facing large companies, micro, small and medium-sized enterprises (MSMEs) not only have limited resources but they tend not to be aware of the linkages that increasingly exist between environmental management and economic competitiveness. Programs that can effectively respond to the specific needs and peculiarities of smaller companies are scarce, and the adoption of environmental management systems or certification programs, such as ISO 14000, can be financially burdensome for MSMEs.

Training companies on energy efficiency, water usage and waste management has been identified by the Mexican government as a means to enhance economic competitiveness of the country while attaining environmental performance goals. Working with large companies, such as Alpura, Jumex, Nestle, Vitro, Johnson Controls, Colgate Palmolive and BASF, and their suppliers has become a priority for the Ministry of the
Environment. Through 40-hour face-to-face workshops organized with local universities, the Environmental Leadership for Competitiveness Program of the Procuraduría Federal para la Protección Ambiental (PROFEPA) has trained around 3000 companies throughout Mexico. However, the program, which was launched in 2007, tackles enterprises of more than 25 employees that account for only 5% of a total of 370,000 existing manufacturing establishments in Mexico. The program is limited in its scope, as it became evident in its failure to reach its goal of training 5,000 SMEs by 2012.

The challenge is to develop a low-cost, educational tool that is both accessible for a high-volume of MSMEs, particularly for those who have less than 30 employees and comprise 98 per cent of all companies in Mexico, and can, in a short period of time, effectively reach a large number of the universe of MSMEs in Mexico. Such a tool should help: 1) increase the awareness of MSMEs about the increasing importance of environmental sustainable practices for their competitiveness and survival; 2) enable them to easily and in a cost-effective way implement environmental practices that make them competitive and attractive as sustainable suppliers; 3) improve the competitiveness of the supply chain of large companies for which they provide products and/or services; 4) and generate information about the current state of sustainability and MSMEs, which to date is quite limited and prevents both large companies and the government from defining sustainability standards that are appropriate and specifically designed specifically for small businesses, without jeopardizing their economic viability.

References
[i] Figures from speeches at the Corporate Sustainability Forum, June 17th, Rio+20.
[ii] According to the Ministry of the Economy, while the MSMEs represent 99 per cent of all businesses in Mexico, they account for 80 per cent of all employment in the country and about 35 per cent of GDP (http://www.economia.gob.mx/mexico-emprende/empresas).
[iv] According for the Federal Commission of Electricity (CFE), there are about 3.5 million the micro, small and medium-sized enterprises (MYPMEs) whose electricity consumption represents half of all their energy consumption http://www.eluniversal.com.mx/finanzas/88917.html

Viegas, Marcio
Founder & Managing Director, SUST4IN, Spain, marcio.viegas@SUST4IN.com

"Implementing the Sustainable Development Goals (SDGs) at business level: a management system framework"
The "Transforming our world: the 2030 agenda for sustainable development" not just defines the Sustainable Development Goals (SDGs), but is historically calling businesses to get involved. In order to answer to the call, businesses should understand, assess, implement, monitor, report and continually improve their sustainable development performance and solutions. “No one should be left behind” means for business that all organizations, “ranging from micro-enterprises to cooperatives to multinationals” should be able to respond.

Visionary business leaders have already recognized that the SDGs are a great business opportunity or plain common sense. The challenge is to implement the SDGs beyond the leading companies. The good news is that at least one million organizations in more than 170 countries and for up to 30 years have been managing a variety of sustainable development themes from environment, health and safety and social accountability to resilience through management systems: “a set of interrelated or interacting elements of an organization to establish policies and objectives and processes to achieve those objectives”.

This paper proposes a high level structure for a Sustainable Development Management System (SDMS) to “get started” and effectively implement and maintain the SDGs at any type of organization, regardless of its size, activity and location. The proposed high level structure is also based on the principle of continual improvement, on the plan, do, check and act (PDCA) cycle and on existing international standards and guidelines created by the International Organization for Standardization (ISO), namely its standard structure for Management Systems (“Annex SL”), the UN Global Compact, the International Labour Organization (ILO), Social Accountability International (SAI) and others.
Planetary Boundaries (Including Biodiversity/Ecosystem Services)

Christ, Benjamin; Ryan C. Richards, Andrea Bartazini, Alexandre Uezu
MDP Candidate, University of Florida, United States, jbenjamin.christ@ufl.edu

"A Social Marketing Approach to Environmental Education for Extreme Drought in Brazil"

Drought represents a complex socio-environmental problem that is increasingly common and severe due to ongoing global changes. Yet, despite human familiarity with drought, its understanding by different social groups is neither simplistic nor one-dimensional, but rather embedded in complex contextual settings that shape people’s situations, life views and behaviors. Community-based social marketing provides an approach that helps to tailor interventions to these diverse audiences. In Brazil, which retains 15% of the world’s freshwater supply, half of the recorded natural disaster events are drought related. In recent years, research has led to a better understanding of the connection between pervasive deforestation in the Amazon and Atlantic Forest regions, and water security in the rest of the country. Nazaré Paulista is a small municipality located about 90 kilometers northeast of Brazil’s largest city, São Paulo. A priority area for conservation due to its proximity to remnants of the Atlantic Forest, it also lies on the banks of the complex Cantareira Reservoir System that supplies water to over 12 million people. The Cantareira’s water levels fell to critical levels during prolonged drought events throughout 2013-2015, spurring civil discontent. Nazaré Paulista is also home to the headquarters of IPÊ—Instituto de Pesquisas Ecológicas, a non-governmental organization that prioritizes natural resource and biodiversity conservation and environmental education in several locations throughout Brazil. As part of a growing partnership between IPÊ and the University of Florida’s Tropical Conservation and Development program, this presentation will deliver preliminary results from a Masters of Sustainable Development Practice field practicum in Nazaré Paulista to be carried out between the months of June and September of 2015. The practicum will explore the views of different social groups about extreme drought by implementing a series of semi-structured interviews and focus groups with the participants of two environmental education programs at IPÊ, as well as with the environmental educators instructing them. “Semeando Água” seeks to influence best land use practices that contribute to the conservation of water resources among rural producers in the area of Nazaré Paulista. “Nascentes Verdes Rios Vivos” includes community involvement in reforestation activities, particularly with middle school students. I plan to use tools and concepts of community-based social marketing to explore these groups’ perceptions and understandings of drought and deforestation, and to better link IPÊ’s environmental education curriculum with its target audiences. The goal is to improve the potential of...
IPÊ’s environmental education activities to further contribute to the protection of water resources around the important Cantareira Reservoir System.

**Dyna Barroso, Felipe**  
Master’s of Development Practice Candidate, University of Minnesota, Humphrey School of Public Affairs, United States, feliped.barroso@gmail.com

"Conservation for Sustainable Development: Building From UNESCO’s Framework to Preserve and Manage Mount Malindang, Philippines"

The project is a collaboration between University of Minnesota Master of Development Practice (MDP) students and the Philippines National Commission for UNESCO (NatCom) to foster environmental conservation and sustainable development in the Mount Malindang Range Natural Park (Mt. Malindang) through the implementation of UNESCO’s flagship conservation program called the “Man and the Biosphere” (MAB).

The MDP team (Team) is composed of three students: Abdiwahab Ali, Felipe Dyna Barroso, and Maria Victoria Punay. Using a multidisciplinary approach, the Team will develop a report assessing a) Mt. Malindang’s potential for sustainable development and conservation value and b) a full documentation of the tools and processes used. Furthermore, the Team will compose Mt. Malindang’s nomination file for the MAB programme, to be submitted to UNESCO upon validation of NatCom. Lastly, informed by their work on the site, the Team will produce a general framework aimed at the Philippine environmental conservation community to guide future nominations for MAB designations.

The project will be divided in three phases: contextual scan, community consultation, and report writing. Firstly, the contextual scan will involve mapping the policy implementation field related to the sustainable development and conservation of Mt. Malindang, a knowledge-sharing process with key organizations (government agencies, research centers, etc.), and a literature review. Secondly, the community consultation will consist of facilitated discussions with local stakeholders and a two-week-long site visit that includes a) an immersion and dialogue with several villages of the Subanen tribe and b) visits to sites of high conservation and biodiversity value. A validation conference with stakeholders will be held prior to the Team’s departure from Mt. Malindang, closing the second phase. Thirdly, the report writing phase refers to the compilation of the gathered information and the composition of the three project deliverables: the nomination file of Mt. Malindang as a UNESCO Biosphere Reserve, the MAB General Framework for the Philippines, and a full documentation of the processes, tools, and results of the project.
This project intends to be a multidisciplinary study of environmental conservation as a means to foster sustainable development and as an end in itself, within the context of the Philippines’ effort to implement a UNESCO conservation program. This undertaking is essentially about finding the intersection of the natural, social, and management sciences that concerns the implementation of the 2015 Sustainable Development Goals. Moreover, the project’s outputs bring together practice and research, in a bundle that aims to further enhance the capacity to implement the 2015 SDGs.

Jain, Amrita Vijay; Diego Villagra Mostaceros
MDP Candidates, Humphrey School of Public Affairs, University of Minnesota, USA, jainx227@umn.edu, villa169@umn.edu


In the last two years, Meghauli, a small village on the fringes of Chitwan National Park (CNP), Nepal, has had to cope with 4 fatalities, 11 serious injuries[1] and about $15,000 worth of crop loss due to wild animals. The impact of this loss is grave, as the main source of livelihood in the village is agriculture. In fact, stories of loss and damage are common across the 25 toles (hamlets) in Meghauli. Sharing a border of 25 km. with the national forest, Meghauli represents one of the biggest hurdles in the dynamics between biodiversity conservation and sustainable development that decision-makers at Chitwan National Park currently face.

The amount of loss in terms of lives and livelihood becomes even more staggering if we consider that in the entire border area of the protected park, around 30 tigers have killed close to a hundred people[2] in an area of 766 square kilometers within the last 20 years. Further, the gross data on amount of crop damage and financial loss is not available. Even as Nepal celebrates three years of zero poaching, mitigation of human-wildlife conflict is a growing challenge around the park’s border, an area known as the “buffer zone.”

According to World Conservation Union (World Park Congress, 2003), human-wildlife conflict occurs whenever wildlife’s requirements overlap with those of human populations, creating tension between local residents and wild animals. Further, given that residents of CNP’s buffer zone heavily depend on forests, wildlife conservation measures cannot be successfully implemented without mitigating the scale of this issue. The need to correct this situation is also crucial, as the country has adopted a community-driven conservation policy. Finally, efforts to mitigate human-wildlife conflict are
widely considered essential[3] in seeking to maintain a healthy attitude from local residents toward wildlife and its conservation.

To this end, our study aims at identifying various conflict mitigation efforts, as well as gathering local perceptions and attitudes toward wildlife. Meghauli was chosen as the study site for two reasons: 1) its particularly interesting geographical location, surrounded by CNP on three sides and bound by two rivers, the Rapti and Narayani on the east and west, respectively; and 2) because this research will serve to inform the ongoing conflict mitigation efforts that our research collaborator, the National Trust for Nature Conservation, is undertaking in the area.

In order to assess possible conflict mitigation interventions, we conducted a Rapid Rural Appraisal (RRA) in Meghauli. This RRA included a community participatory map to understand conflict and mitigation sites, two transect walks, 12 stakeholder interviews, and a focus group using participatory intervention planning (PIP) as a framework. Through these efforts, we aimed at identifying the main areas of fund allocation by the government and buffer zone user committee in order to understand current spending patterns on mitigation efforts, decipher possible interventions by encouraging discussion between local residents, community leaders, and technical experts, as well as factor in the history and success of human-wildlife conflict mitigation efforts in the area. Finally, we also surveyed one hundred households in Meghauli from all its nine wards, in order to record communities’ perceptions toward wildlife in Meghauli and their willingness to participate in future mitigation efforts.

The end result of this research was presented in a final report, which included three working models for possible interventions. These models were arrived at by combining the data obtained from the RRA and the household surveys.

References
"Green Grant Program: Impacts on the Families Living Conditions and Environmental Conservation"

This study analyzes the perception of beneficiaries of the Green Grant Program (Programa Bolsa Verde, in Portuguese) regarding the impacts the program has had on their living conditions and environmental conservation. The Green Grant Program, is a federal Conditional Cash Transfer scheme that grants BRL300.00 (USD100) every three months to families in extreme poverty condition (family per capita income below USD25) living in sustainable use protected areas, rural settlements and traditional territories key to environmental conservation. The program was created in 2011 (Law 12,512) and is part of the national strategy for poverty eradication. Its main goals are: socioeconomic inclusion of families living in extreme poverty conditions; to stimulate conservation and sustainable use of ecosystems services and goods by the families; to promote citizenship. To comply with the program conditions all beneficiary families must respect the restrictions established by management instruments and programs. To verify the family's compliance to the conditions and the impact of the program on the living conditions and conservation, an annual monitoring program is being conducted by Federal Rural University of Rio de Janeiro in partnership with Conservation International Brazil. For the 2014 cycle, the Program benefited 51,498 families in 938 territorial units across Brazil. For the monitoring a sample with 1,088 families in 260 territories were randomly selected. Another 1,088 families were also sampled as a control group (non beneficiary families). The selection criteria for the sample were: i) the total number of beneficiaries and growth projections; ii) the distribution of beneficiaries among different territorial units; iii) the distribution of the number of beneficiaries among biomes. A comprehensive survey about the program was conducted with the 2,176 families between February-May. Two sets of questions were addressed to their perception about the improvement/decrease of living conditions of the family and the overall environmental conservation in their territories. The study revealed that for 77% of beneficiary families the cash transfer has a high or very high impact on the improvement of local environmental conservation and conditions by stimulating families to comply with the rules and avoid illegal activities such as deforestation, burn and poaching while the percentage of non-beneficiary families who believe in a potential high or very high impact was 82%. Beneficiaries (81%) and non-beneficiaries families (79%) also think that the
cash transfer value has a high or very high impact on improving their living conditions. The high positive perception found in the study may reveal the importance of the program for income raise in the territories as well as to reinforce the clear link between the cash benefit with environmental conservation.
Social Inclusion (Including Gender & Human Rights)

Ahmed, Bilal
Assistant Professor, Greenwich University, Pakistan, bilaleconomist@hotmail.com

"Income, food expenditure and socioeconomic dynamics: A gender based analysis of Karachi fishery workers"

The aim of this research is to investigate the relationship of income with food expenditure that how it is attached with socioeconomic dynamics of a household in context of gender. How the female-headed households are different from male headed is the central objective. The study would randomly collect the primary data from field using structured-questionnaire of fifty of each male and female headed household – to address the following questions using scaling and econometric modeling for data interpretation.

1. What the income levels are? And, how income of the respondent is attached with food expenditures - in context of gender based dynamics.
2. What the dynamics of consumption patterns are? How the gender-based income is linked with consumption pattern? And, how it is linked with degree of earning?
3. What the compare of income is – in context of gender – and, how the gender based ‘income difference’ look like? And, what are the possible reasons of it?
4. What the dynamics of working hours are? And, what the degree of ‘hardship’ of working is? And, how it is linked with income of the respondent – in context of gender.
5. What the dynamics of ratio of ‘food and non-food expenditures’ are? And, how this ratio is linked with consumption patterns – and, how the expenditures priority look like – in context of gender.
6. What the role of debt in consumption patterns is? And, how it is linked with income and food expenditures?
7. What the dynamics of education expenditures are – and, how it is linked with income and patterns of consumption – and, how it is or it is not linked with food expenditures – in context of gender.
8. What the dynamics of per-day labour income with per-day food, education, housing and health expenditure is? And, how it is link to manage the daily life to address the overall socioeconomic issues – in context of gender.
9. Finally, this study would address the formulation of project-based rehabilitation and interventions by civil society to resolve the issues of sampled community to general population - to address the issues of policy questions.
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

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