

Food Security And Agriculture, The Socioeconomic Footprint In Latin America:
Guatemala, Colombia and Brazil

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Abstract

Malnutrition, in every form, presents significant threats to human health. Today, Latin American countries especially Guatemala, Colombia, and Brazil are facing this problem which includes undernutrition, and overweight.

Improving nutrition extends beyond basic caloric needs and incorporates all forms of malnutrition including childhood wasting, stunting, micronutrient deficiencies (particularly in children, pregnant and lactating women), and obesity. Malnutrition is therefore highly relevant to all countries. The FAO estimated that 41 million Latin Americans representing 13% of the population are undernourished. 38% of Guatemalans, Hondurans, and Haitians, 30% of Ecuadoreans, and 23% of Peruvians are believed to be inadequately nourished. The quality of the diet varies widely between countries and regions because of a multitude of cultural, environmental, and socioeconomic factors.

In the Western Hemisphere, Guatemala is alarming with one of the most food security challenges in history. The country has the highest prevalence of stunting where more than 46,5% of the child population, which means nearly 900,000 children fall into this category (Seguridad Alimentaria y Nutricional en América Latina y el Caribe 2015 - ECLAC). This is a measure of severe and irreversible physical and cognitive underdevelopment that ripples throughout the life course, perpetuating the intergenerational transmission of poverty and strangling the rural economy.

However, in Latin American, the combination of nutritional problems caused by excess weight and by undernourishment ("the dual burden of malnutrition") is a recent development in the region which merits greater attention, since it is a reflection of inequalities within families, households and countries. As early as the year 2000, Doak and others (2000, 2005) found that 11% of Brazilian households exhibited both problems. In Colombia, the Food and Nutritional Security Observatory (OSAN, 2014) defines this dual burden as the existence in the same household of an overweight or obese adult and a child suffering from undernutrition. At the national level, this dual burden is present in 8.2% of all households, but the rate in some departments is over 15% (in Amazonas, Guainía, La Guajira and Vaupés). Barrios de León and others (2013) conducted a study in the municipality of Huitán in Quetzaltenango, Guatemala, and found that nearly 65.4%

of the children there suffered from stunting and that a dual burden was present in 12.7% of the households.

Improving nutrition extends beyond basic caloric needs and incorporates all forms of malnutrition including childhood wasting, stunting, micronutrient deficiencies (particularly in children, pregnant and lactating women), and obesity. Malnutrition is therefore highly relevant to all countries. The FAO estimated that 41 million Latin Americans representing 13% of the population are undernourished. 38% are Guatemalans who are living in inadequately nourished. The quality of the diet varies widely between countries and regions because of a multitude of cultural, environmental, and socioeconomic factors. In general, the diet is heavy in carbohydrates and light on protein. Undernutrition has a characteristic mortality pattern with deaths concentrated in those under 5 years of age and with physical and mental effects that may persist throughout the lifespan.

The Latin American population was increasing by 2.3 percent a year in 1983, representing 9 million new consumers each year. Food production increased by 3.9 percent a year between 1971-80, but in at least 1/3 of countries, the rate of increase in food production was exceeded by the population growth rate. The relationship between population and

food is complex and is affected by multiple and changing environmental, economic, and social factors directly related to the international economic system. Latin America must augment its food production capacity and should decrease its rate of population growth.

Indigenous communities; as we know, Colombia, Guatemala and Brazil have a significant amount of indigenous population which according to the Economic Commission for Latin America and the Caribbean (CEPAL), the prevalence of stunting is over twice as high for indigenous children under five compared with the nonindigenous children, from 22,3% in Colombia to 58% in Guatemala.

Ending hunger, achieve food security, improve good health and well-being, better education, gender equality, peace, and justice. All of these issues can improve and take action regarding goal number two “End hunger, achieve food security and improved nutrition and promote sustainable agriculture”. However, the transition stage that includes Colombia and Brazil, they have been increased consumption of sugar, fats and processed food. In a nutritional condition, this creates nutritional deficiencies and obesity co-exist (FAO, 2010). Around 18.3 million schoolchildren in 60 countries received meals, snacks or take-home food through WFP in 2017.

Finally, recognize 46 countries have implemented school meals programs are linked to local smallholder farm production, combining nutritional and educational benefits with a positive impact on local economies.

This thesis by Maria Alejandra Martinez Bustamante fulfills the thesis requirement for the master's of Arts in International Affairs degree approved by James Quirk, Ph.D. as Director, and by Diana Rich, Ph.D. as reader.

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Acknowledgements

This research draws from both a broad literature review including interviews with local and foreign experts in Guatemala as part of the Western Hemisphere including Brazil and Colombia. The principal author met with representatives from the government of all three different countries in the U.S. but also with the U.S. Agency for International Development (USAID) and Congressman McGovern lead of the program “Feed the Future”. An array of program implementing partners as well as relevant UN technical staff also contributed substantial knowledge and insight to this analysis.

Food security and nutrition in Latin America countries is one of the biggest concern that will continue to be present due to the pressure that continued population growth will exert in the already limited resources. Nutrition is a key element for any children, and it’s crucial because the development that they need for their physic motor, and mental health. However women and children in Latin America are having big problems due to the highest levels of malnutrition including stunted, wasted, malnourished, underweight, and obesity. When we combined all these factors, the result is going to affect directly the social and economic development if the country working in parallel to achieve the Sustainable Development Global Goals (UNSCN, 2015)¹.

¹ For further information, see the United Nations System Standing Committee on Nutrition (UNSCN), "NUTRITION and the Post-2015 Sustainable Development Goals", Geneva, 2014 [online] https://www.unscn.org/files/Publications/Nutrition__The_New_Post_2015_Sustainable_development_Goals.pdf.

Globally, the prevalence of chronic malnutrition (stunting) fell from 29.5 percent to 22.9 percent between 2005 and 2016. This still leaves 155 million children under 5 facing an increased risk of impaired cognitive ability, poor school performance and death from infections. There has been an impressive decline in chronic malnutrition prevalence since 2000, when 198.4 million were affected. However, in Guatemala, Colombia and Brazil, stunting rates jumped from 25.2% in 2017. And Guatemala as high as 49.8% percent in the Western Hemisphere. But in terms of inequality, malnutrition is concentrated among the poor, the least educated households, the rural population and indigenous people. Only 20% of children whose mother or father have more school opportunities than primary education are stunted. The corresponding figure is three times as high among children whose parents did not complete the primary education in 60%.

How can we work with these global goals together? Addressing hunger means ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

Goal 2: Ending hunger, we can achieve food security and improve nutrition through a sustainable agriculture development.



Sustainable Development Goal #1: “No Poverty” is positioned to end poverty in all forms everywhere. For Colombia, Guatemala and Brazil, SDGs #1 is one of the most important nevertheless the main problem is the minimum wage where under 10% of the world’s workers are living with less than \$1.90 per person per day, down from 28% by 2000. For that reason, building resilience can mitigate the risk; in this case, resilience is the capacity to recover quickly from difficulties and make the way more sustainable developing ideas that might help the community (Undp.org. (2017). Goal 1: No Poverty).

Goal #2: “Zero Hunger” End hunger, achieve food security and improved nutrition and promote sustainable agriculture. This goal aims to end hunger and all forms of malnutrition by 2030. It also an assignment to work for safe, nutritious and sufficient food at all times of the year. This means countries will require a sustainable food production system and resilient agricultural productivity. Technology and markets, international

cooperation and investment are part of that boost agricultural productivity to achieve this goal. This fight to end hunger has been for over the past 15 years, although, hunger has declined, from 15 percent between 2000 to 2002, to 11 percent from 2014 to 2016. There are more than 790 million people are continuing struggle for the lack of access to address their dietary energy and get enough calories, and be productive through nutritious food.

Objectives

1. Addressing the alarming rates of malnutrition including overweight have been increasing in the last decade in Latin America specifically in Guatemala, but also in Colombia and Brazil. How food security, agriculture and nutrition can impact economic and social levels in each country?

2. Analyzing the concept of food security, which it has involved over decades concepts such as sustainable, development, holistic, resilient, organic and biotechnology. What are the actions might address these issues.

3. Taking different perspectives to eradicate hunger which is starring 821 millions of people in 48 countries around the globe. How can we do to bring affordable and accessible food? How is the agriculture system in Guatemala, Colombia and Brazil? Are they having enough food to feed the communities?

4. Children are the most vulnerable population in the world, as a new generation, it is valuable to create a package of measures regarding why should be important to feed property children during the 1,000 days as a crucial time for their development?

Methodology

This research study consisted of a deep analysis into nutrition and agriculture world related in global food security in places to address organic agriculture combined to holistic development with variables qualities, data, and graphics. The research apply in three Latin American countries, including Guatemala, Colombia and Brazil. However, it empathizes in Guatemala as the country with a mayor challenge where it should follow Brazil and Colombia as a case study and example of success. Most of the research includes qualitative information, however in chapter number 3, it included a couple interviews with moms in pregnancy, or moms who gave birth in the last 4 years. These moms are from the countries focus, in some cases the name is not real due to the immigration laws.

Key words

Nutrition, malnutrition; underweight, overweight; 1,000 days, children; Latin America, Colombia, Brazil and Guatemala.

Purpose

The purpose of this thesis was to analysis the potential indicators for food securities among countries in the western hemisphere as Guatemala, Colombia and Brazil. Particularly, how a country with a stable agriculture system and economy is giving a spatial disfunction of malnutrition indices among those living in the Guatemala with scarcity of literacy, food, and other problems. By comparing the prevailing disparities of food security in the Americas, the thesis was positioned to answer if Guatemala might be willing to adapt mechanisms or find any match regarding food security and agriculture footprint in the countries examples, Colombia and Brazil.

Significance

The significance of these findings shall bare if retailer distribution can reflexively function as a passive socioeconomic barrier to those who are most at risk of hunger and those suffering from established food insecurities in Guatemala base on the countries leaders.

Hypothesis

This research was undertaken by three countries in Latin America. The selection of these countries is with the idea to make a parallel between one main country (Guatemala) with staggering the levels of poverty, malnutrition and undernutrition are stunning. The government does not care much for the society, and the biggest investor is the United States. Comparing that situation with a developing country (Brazil) which has social programs and it's being growing fast and implement technology to produce food, have more commodities, and better sources. Finally, a third country developing country (Colombia), with interesting projects in different sectors including agriculture, addressing the Sustainable Development Global Goals, and now it's working hard to implement a post-conflict, get better sources, educate people and eradicate that lack of education, implement new project to recover lands and make them more productive. (The case studies collected both primary and secondary data and were validated by key stakeholder interviews across the school feeding system, nutrition system, and food security issues.

Assumptions

Assuming a system where the extreme levels of food insecurity reveals an extreme relation with agriculture and the inequities of substances availabilities measured by food

security states of those who lives in Latin America as Guatemala, Brazil and Colombia. It is anticipated the important of socioeconomic metrics highlighting the categories, and different food and agriculture systems.

Questions

1. Does the development of the country influence the nutrition that children have?
Does the development socioeconomic of the country impact in the different level of malnutrition?
2. How is each country in Latin America is taking action and decreasing levels of poverty and undernourishment that no only affect children but even more the economy and development levels?
3. More than 175 biofortified varieties of 12 food crops have been released in more than 30 countries, reaching 30 million people around the world. So, comparing this situation, what the government should work more to get done programs addressing food security? The effort to bring modern agricultural techniques in Latin American countries is an idea already started but the process is low, demands a lot of money, and we the government is aware of that but the corruption corrosive the system. Although, in these countries biotechnology and biofortification on seed already started, the implementation seems slow.
4. Based on the social and economic level, what are the linkages between mother and the nutrition of their children? In 2016, about 821,000 children less than five years old died, so the point is it could be prevented globally per year through more widespread breastfeeding. In addition to reducing infant death, breast milk feeding provides an important source of micronutrients, clinically proven to

bolster the immune system of children, and provide long-term defenses against non-communicable and allergic diseases.

Definitions

Dollars or USD, are presumed U.S. dollars unless otherwise noted.

Economic growth is the long-run progression of economic expansion that results from a compounding of economic events throughout time (Sharp, Register, & Grimes, 2010).

Food security is the reliable capacity to procure sufficient foods to sustain an active, healthy lifestyle (World Bank, 1986).

Malnutrition refers to the abnormal physiological condition caused by deficiencies, excesses or imbalances in energy and/or nutrients necessary for an active, health life. Malnutrition includes undernutrition, micronutrient deficiencies, overweight and obesity.

Latin America is considered all western hemispheric countries south of the United States (American Heritage Dictionary, 1994).

Stunting - Stunted growth, also known as stunting and nutritional stunting, is a reduced growth rate in human development. It is a primary manifestation of malnutrition with multiples infections, such as diarrhea and helminthiasis, in early childhood and even before birth. Although, it's due to malnutrition during fetal development brought on by

a malnourished mother². A child is stunted at age 2, they will have higher risk of poor cognitive and educational achievement in life, with subsequent socio-economic and inter-generational consequences. Most stunting happens during the 1,000-day period that spans from conception to a child's second birthday. As of 2012 an estimated 162 million children under 5 years of age, or 25%, were stunted in 2012. More than 90% of the world's stunted children live in Africa and Asia, where respectively 36% and 56% of children are affected³.

Obesity is a condition that presents a risk to health by abnormal or excessive fat accumulation. A crude population measure of obesity is the body mass index (BMI), a person's weight (in kilograms) divided by the square of his or her height (in meters).

Overweight and obesity are major risk factors for a number of chronic diseases, including diabetes, cardiovascular diseases and cancer. Once considered a problem only in high income countries, overweight and obesity are now dramatically on the rise in low- and middle-income countries, particularly in urban settings. This problem has been affecting childhood in many low- and middle-income families in developing countries, particularly in urban setting although the rural is getting affecting as well.

Undernutrition means wasting, stunting, underweight, and deficiencies in vitamins and minerals. Undernutrition makes children in particular much more vulnerable to disease and death. Individuals with undernutrition are no longer to maintain natural bodily capacities, such as growth, resisting infections and recovering from disease, learning and physical work, and pregnancy and lactation in women. One of the consequences is poor

² <http://apps.who.int/nutrition/landscape/help.aspx?menu=0&helpid=391&lang=EN>

³ <http://data.unicef.org/resources/2013/webapps/nutrition>

feeding of infants and young children, especially the lack of optimal breastfeeding and responsive complementary feeding, along with illnesses. Estimates for underweight prevalence are based on the most recent data available to UNICEF for years between 1996 and 2005 from 110 countries, covering 98 per cent of the developing world's under-five population. Trend analysis is based on a subset of 73 countries with available trend data for 1990–2004, covering 86 per cent of children in developing countries.

Terms

BRL Brazilian real

FAO Food and Agriculture Organization of the United Nations ha hectare(s)

kg kilogram(s)

MDA Ministry of Agrarian Development

MERCOSUR Southern Common Market

TEC Common External Tariff

UN United Nations

ECLAC Economic Commission for Latin America and the Caribbean

Review of Literature

Food security has sustained an all-pervading role in any interface of individual, community and genus survival. Guatemala a focus country in this research is located in Central America bordered by Mexico on the north and west, El Salvador on the south, and Honduras and Belize on the east. It has a surface area of 108,889 square kilometers, two thirds of which is mountainous, with dense jungles in the north and fertile plains on the coast. Of the 13.22 percent arable land, 5.6 percent is used for permanent harvesting.

With a population of nearly 13 million, women represent 52% and indigenous people 38,4%. About 52% of the population live in rural areas. Guatemala is a multi-ethnic country, it occupies an area that was the heart of the Mayan civilization. Historically, the indigenous majority has been marginalized from the country's political process. Guatemala has a long tradition of violence, whether political (coups d'état, military governments, guerrilla uprisings, armed conflict, rightist paramilitary groups, political assassinations, etc.), social (intra-family violence, violence against women, etc.), economic (theft, kidnapping, extortion, and gangs) or institutional (community lynching, police participation in criminal acts, expansion of the influence and embedding of organized crime and drug- trafficking in State institutions etc.). Security forces capable of ensuring public order are lacking. Private security companies currently outnumber public forces by 75 percent (OECD, 2018)

Chapter One

Status of nutrition in Latin America: Guatemala in context (malnutrition and poverty including culture, geopolitics and socioeconomic situation).



Food security is facing real threats. Malnutrition and poverty levels are triggering. The concept of food security is multi-dimensional and requires a set of indicators to properly measure it. When we talk about this term we need to know the world is being a target for food insecurity.

Food insecurity is defined as “The state of being without reliable access to a sufficient quantity of affordable, nutritious food” by the Oxford Dictionary. While a popular belief on food insecurity is centered around the availability, it is equally important to focus on the quality of food. Guatemala’s plentiful fields of nutrient-rich fruits and vegetables hide reality; Guatemala is the fourth most malnourished country in the world and ranks first in Western Hemisphere (Thurow, 2016).

Food insecurity and malnutrition also pose serious challenges to sustainable development and to achieving the United Nations' Millennium Development Goals in Guatemala. The problem is particularly acute in poor, rural areas — in the Western Highlands and the so-called “dry corridor” of eastern Guatemala — where the population is overwhelmingly indigenous and 90% of children are severely malnourished.

While Guatemala is the most populous country and the largest economy in Central America, its rural and Mayan population still faces great difficulties, being excluded socially, economically and politically due to language and geographical barriers and to a lack of education and economic opportunities.

With a population of nearly 15 million, Guatemala is the most populated country in Central America. It is also one of the poorest. Seventy five percent of the population lives below the poverty line and 58% live in extreme poverty (World Bank). Over half the population is indigenous Maya, and the remainder is primarily of mixed European and indigenous heritage – referred to in Guatemala as Ladino (Readingvillage.org. (2019). Guatemala | Reading Village).

Guatemala's low levels of literacy are the product of failing education systems and limited resources for learning. Because public education is not free in Guatemala, attendance figures are dismal: 80% enrollment of primary-aged children, 30% of middle school-aged children, and 10% of high school students. According to the World Bank, Guatemala indicates that the Gross National Income (GNI) Per Capita for Guatemala is \$2,740 and for the Lower Middle class the average annual income is \$1,619 in US dollars (World Bank, (2010).

Nearly half of its children are stunted, a measure of severe and irreversible physical and cognitive underdevelopment that ripples throughout the life course, perpetuating the intergenerational transmission of poverty and strangling the rural economy. While national economic growth has been steady in recent years, already high levels of poverty have simultaneously crept upwards. Socioeconomic inequality is acute (Data, Country Profiles, U. (2019).

Guatemala has the largest economy in Central America and in recent decades has had relatively stable economic growth. Despite that economic growth, Guatemala's economic inequality and poverty have increased, especially among the rural indigenous population. The Economist Intelligence Unit projects that the country's economic growth rate will likely peak in 2018-2019 at 3.2%, followed by a decrease until 2022. The World Bank calls for rapid economic growth coupled with increased public investment and pro-poor policies to improve social conditions (UNDP, Human Development Indices and Indicators (2018).

According to the Fact Book by the Central Intelligence Agency (CIA, 2018) key agricultural exports include sugar, coffee, bananas, and vegetables. Guatemala is the top remittance recipient in Central America as a result of Guatemala's large expatriate community in the US. These inflows are a primary source of foreign income, equivalent to two-thirds of the country's exports and about a tenth of its GDP.

Guatemala GDP 75,62 B (CIA, 2017) with a gross national 13,6% of GDP in 2017 in a scale of 141 as a country comparison to the world. Agriculture 13,3,% and Industry 23,4% are

the two major components by sector of origin by 2017. The labor force by occupation in agriculture is 31,4% (CIA, 2018). With an unemployment rate 2,3, and population below poverty line in 59,3%. It's crucial to mention the main exports partners that Guatemala has as US 33.8%, El Salvador 11.1%, Honduras 8.8%, Nicaragua 5.1%, Mexico 4.7% (2017). The exports commodities are sugar, coffee, petroleum, apparel, bananas, fruits and vegetables (broccoli, maize, pees, French green beans, blackberries, cantaloupe, watermelon, peppers, papaya, and macadamia nuts), cardamom, manufacturing products, precious stones and metals, electricity (FreshPlaza, 2016).

The distribution of income remains highly unequal with the richest 20% of the population accounting for more than 51% of Guatemala's overall consumption. More than half of the population is below the national poverty line, and 23% of the population lives in extreme poverty. Poverty among indigenous groups, which make up more than 40% of the population, averages 79%, with 40% of the indigenous population living in extreme poverty. Nearly one-half of Guatemala's children under age five are chronically malnourished, one of the highest malnutrition rates in the world.

Guatemala in terms of chronic child malnutrition has the worst indicators in the world. It is not only the prevalence of malnutrition which in 2000 was 44 percent. However, it is much higher comparing with any other country in the Latin American and the Caribbean region. So now, the prevalence of stunted children in Guatemala has declined from 59 percent in 1987 to 44 percent in 2000, the percentage yearly rate of change (less than 2 percent) has been the slowest in the Latin American and the Caribbean region. For example, between 1986 and 1996, Brazil (with a yearly rate of change of more than 6 percent) reduced chronic malnutrition three times faster than

Guatemala. (Marini Ra and Gagnolati Michele, (2000) *Malnutrition and Poverty in Guatemala*).

Beyond of that, 16 percent of children in the richest quintile of households based of per capita consumption are chronically malnourished. The total proportion is 62 percent among children in the poorest quintile. Only 20 percent of children whose mother or father have more schooling than primary education are stunted. The corresponding figure is three times as high among children whose parents did not complete primary education (60 percent). The prevalence of stunting is 31 and 50 percent in urban and rural areas respectively. The prevalence of chronic malnutrition is almost twice as high among children of indigenous families (58 percent) as among children of non-indigenous families (32 percent).

When it defines malnutrition as the result of the interaction of many factors including individual and household decisions, community infrastructures, and the cultural and natural environmental where people live. As part of that is national policies and economic conditions in the region. On the other side, high rates of malnutrition jeopardize the economic growth of the country which it is affected for the low level of intellectual and physical potential of the population. Poverty is due to the malnutrition that contributes to expose individuals to diseases. In Guatemala, 64 percent of extremely poor and 53 percent of all poor children are stunted, while the corresponding figure for the non-poor is 28 percent.

Guatemala in its constitution of 1985 emphasized and recognized the right to food by pointing out the states guarantees and protects human life from conception, as well as

the person's integrity and security. For that reason, talking about nutrition includes sectorial politics as health, education and agriculture. In the last three administrations, Guatemala has been suffering of inequality, racism, lack of education and sources, but the most cruel idea is malnutrition and poverty.

However, the right for food is a policy that is part of the Law of the National System for Food and Nutrition Security. As part of that, Guatemala has signed at the international level the following plans, strategies and declaration as The Universal Declaration of Human Rights; The International Covenant on Economic, Social and Cultural Rights of the United Nations and its Optional Protocol (pending ratification); The Convention on the Rights of the Child and the Declaration of the Rights and Duties of Man (FAO, The Right of Food (2006)⁴.

The right to adequate food is realized "when every man, woman and child, alone or in community with others, have physical and economic access at all times to adequate food or means for its procurement", as defined in General Comment 12, an authoritative legal interpretation of this right. The three fundamentals pillows of the government started in January 2012. They showed the levels of inequality that the country has been through. Moreover, the town is suffering from corruption, poverty and bad practices of public policies by the Minister of Social Development due to the ineffectiveness and lack of resources.

Zero Hunger Pact and Social Programs; The proposal of Pérez Molina in January of this year, revolved around institutionalizing social programs that are grouped in the Council

⁴ FAO, The Right of Food (2006) <http://www.fao.org/3/a-a0511e.pdf>

of Social Cohesion, with the creation of the Ministry of Social Development (Mides), approved by the Congress of the Republic during the The same days that was approved in the Tax Reform (CELAC, Platform, (2012).

The responsibility to start up a new state entity corresponds to the head of Social Development, Luz Lainfiesta. The start of the execution of the programs is presented several times, due to the re-launch. The programs were renamed with words like "insurance". The program of the "Super Tortilla" began the month of October. The members of the SESAN have to do with the distribution of the fortified flour and will not be able to solve the problem of nutrition, however, the expectations of success in the Ministry of Agriculture, Livestock and Food - MAGA. Within the program benefited 8 thousand 771 children from 1 to 5 years and pregnant mothers. It will work as a pilot plan for 6 months and during this period, 2 sacks of fortified flour per month will be delivered to each beneficiary. The results of this plan are still waiting. It is important to bear in mind that one year of management is designed to measure the impacts of said agreement. However, the measures implemented during the year 2012, will be revealed in the next months of March and August, as well as in the period considered as the shortage of food. The information is based on the investigation. The answer is based on information.

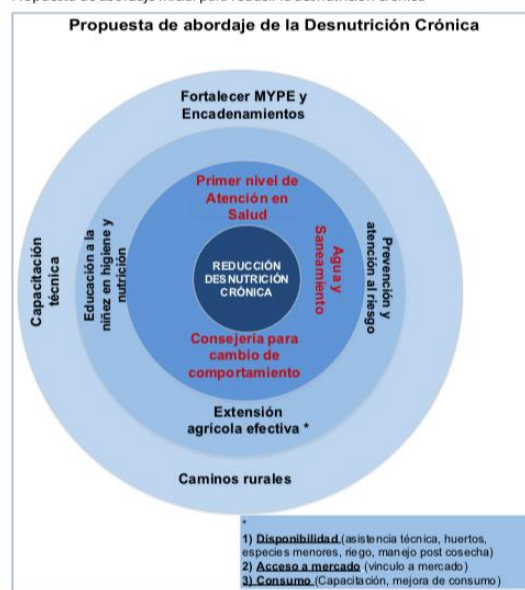
"1000 Day Window Program" was launched in 2013 by the Ministry of Public Health and Social Assistance. It is a mother-child program which provides comprehensive health care and nutrition which aims to reduce the rate of malnutrition in Guatemala. 166 municipalities prioritized under Zero Hunger Pact. The main components are part of the comprehensive health care and nutrition as breastfeeding, hygiene and hand washing, supplementary feeding, vitamin A capsules, MNP, zinc therapy for diarrhea, deworming

for children, folic acid for pregnant women, sugar with Vitamin A, iodized salt, flour with Iron, treatment of children with mild or moderate malnutrition, treatment of severely malnourished children with therapeutic food which is "ready to consume", target population and children from 0 to 2 years of age and their mothers, pregnant and nursing.

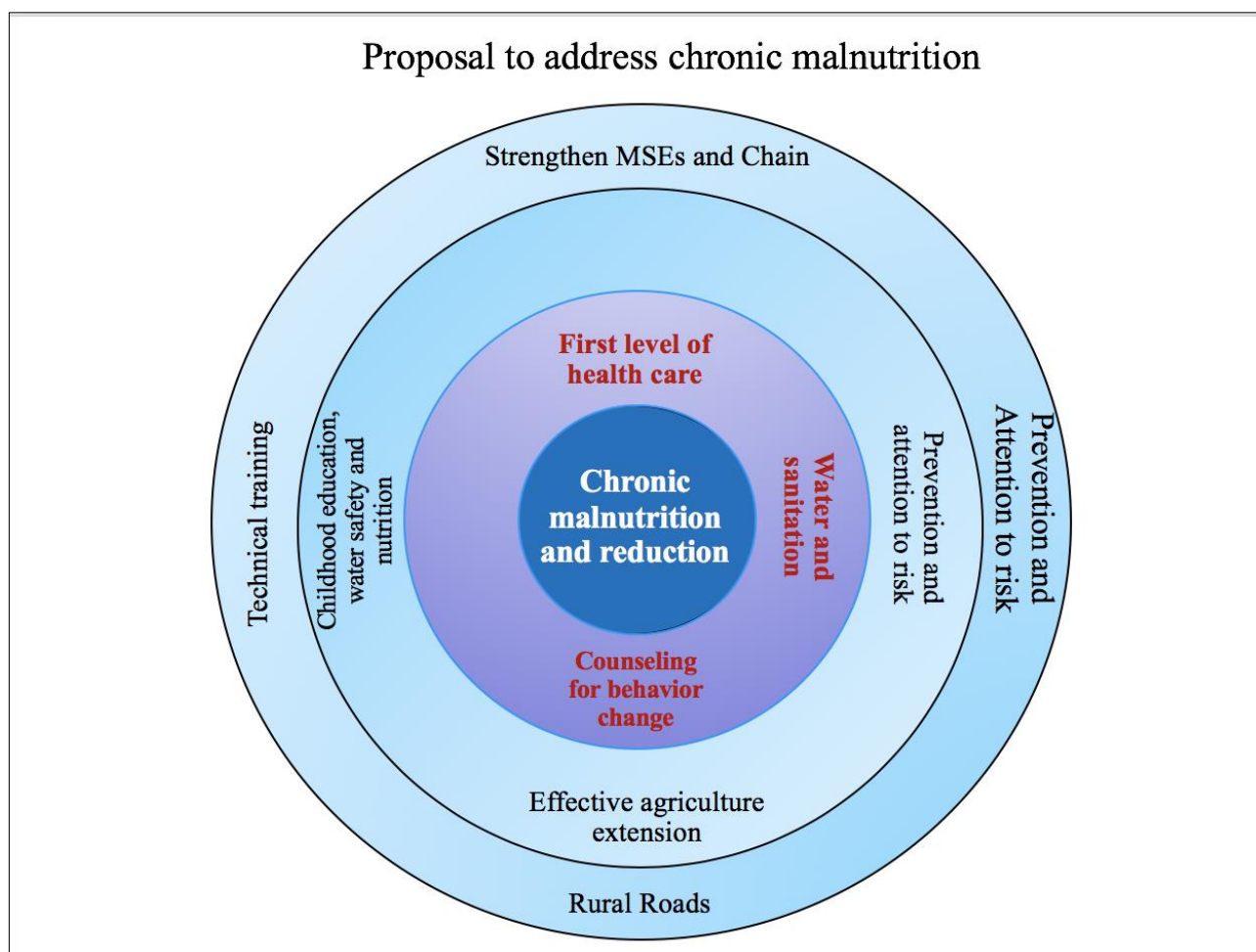
Recommendations for Zero Hunger: strengthen inter-institutional coordination mechanisms. Leaving client programs, which reduce budgets for substantive programs (for example, fertilizers). Prioritize strategies to prevent malnutrition. Strengthen impact measurements, to evaluate the quality of the programs implemented. Separate the coordination functions (SESAN) of the operations.

En el proceso de definición de la propuesta de abordaje para la reducción de la desnutrición crónica, se partió del marco conceptual inicial que se presenta en la figura 3. En el mismo, como acciones imperativas, se presentaban mejorar la atención materno infantil, en el marco del PNA, con el fin de asegurar la implementación de las intervenciones de la Ventana de los Mil Días, identificar la manera mas eficiente de realizar la consejería para cambio de comportamiento e invertir focalizadamente en agua y saneamiento. En un segundo plano se presentaban intervenciones enfocadas en la educación a niños y niñas en higiene y nutrición, el Sistema Nacional de Extensión Rural - SNER- para mejorar la disponibilidad, acceso y consumo de alimentos y en un tercer nivel fortalecer las micro y pequeñas empresas -MyPE- y encadenamientos y los caminos rurales. Este esquema fue modificado en los talleres de definición estratégica.

Figura 3
Propuesta de abordaje inicial para reducir la desnutrición crónica



Proposal – Chronic Malnutrition by the World Bank (Spanish Version)



Redesigned Proposal, how to address Chronic Malnutrition? (English version by Maria A. Martinez)

Corruption, the illness in the region

Corruption in Latin America seems as part of the day-to-day, it's the illness of the region and it has growing rapidly making the citizens worried and angered over something that it does not have scape and it is making a lot of damage. Corruption in LAC is a problem that the system has created in a deep-rooted and despite of the efforts from public sector, private entities and advocacy groups, it does not stop. We are seeing Brazil, Colombia and Guatemala how they got involved with corruption (TransparencyInternational, Report People and Corruption, 2017). Most of the time, corruption may be defined as the provision of material benefits to politicians and public officials in exchange for illicit influence over their decisions.

The corruptor uses private benefits to induce a public decision maker to bend or break formal rules of procedure in order to confer on the corruptor special favors in the adjudication of rights or the allocation of resources (Weyland, The Politics of Corruption in Latin America, Journal of Democracy-Johns Hopkins University, 1998). Politicians and public officials may sell favorable decisions in order to accumulate funds for political purposes, such as a future election campaign.

Lately, Colombia and Brazil have been involved in a major corruption case as Odebrecht, Odebrecht has been central to the Operation Car Wash scandal. On 19 June 2015, Brazilian authorities arrested the former CEO, Marcelo Odebrecht, in connection with their ongoing probe into bribes paid to the Brazilian oil giant, Petrobras. On 7 March 2016 he was sentenced to 19 years and 4 months jail, for paying over US\$30 million in bribes to

executives of Petrobras, in exchange for contracts and influence. In Brazil, on March 04th 2016, former Brazilian President Luiz Inácio Lula da Silva was detained and questioned for three hours as part of a huge fraud inquiry into the state oil company Petrobras after his house was raided by federal police agents. Lula, who left office in 2011, denied allegations of corruption. However, the case has not closed yet all the connections and ties, there are so many people waiting for their judge and some of them have murdered too.

For instance in Guatemala, Otto Pérez Molina assumed the maximum position of Executive of Guatemala in January 2012 and, although he was championed as a candidate who sought social search and improvement of life for the most needy, the accusation of corruption and his subsequent resignation , the balance of its management presents an unflattering balance that evidences many pending tasks. The program of the government of President Otto Pérez Molina was based on three fundamental axes, they are analyzed here:

1.- "Pact Zero Hunger". It raised the fight against chronic malnutrition in the midst of the creation of the Ministry of Social Development, in charge of coordinating the Government's policy of assistance and social protection.

However, Rosa María Leal Flores de Pérez (Guatemala City, December 9, 1953) was the first lady of Guatemala from January 14, 2012 to September 3, 2015, wife of former President of the Republic of Guatemala Otto Pérez Molina who was in charged for possible corruption and fraud inside of "Pact Zero Hunger".

The Zero Hunger Plan is the national movement to eradicate hunger; it is a pact within all sectors of the State of Guatemala including 166 municipalities. (WEIGH) 2012-2016). The plan had two main purposes: address chronic hunger and prevent and mitigate seasonal hunger. The Zero Hunger Plan contemplates five direct components: (i) Provision of basic services in health and nutrition. (ii) Promotion of exclusive breastfeeding and complementary feeding. (iii) Food and nutrition education. (iv) Provision of fortified food (including supplementary fortified foods). (v) Social protection measures for the most vulnerable. (Scaling Up Nutrition (2016). Guatemala: Zero Hunger Plan)⁵.

To solve this problem, the Guatemalan government, international donors, NGOs, and the private sector have funded hundreds of initiatives to better understand and combat malnutrition. In 2012, alone, international agencies spent US\$150 million on 200 projects to improve food security and foster rural development. But food security and poverty indicators in Guatemala have not improved in 20 years, suggesting that past investments have been ineffective. For the most part, these have focused on food distribution and income transfers, but have neglected the role of agriculture in reducing food insecurity and poverty, as well as the importance of science in informing effective policy choices.

However, food security indicators are often used without any attention to the food security dimension in which they operate. The misuse of individual food security indicators can have important implications for policy design and implementation. The main objective of this study is to compare two alternative food security indicators: 1) to

⁵Scaling Up Nutrition (2016). Guatemala: Zero Hunger Plan http://scalingupnutrition.org/wp-content/uploads/2013/02/Guatemala_Zero-Hunger-Plan.pdf

measure the prevalence of food insecurity in a country, 2) to conduct food security profiling assessments, and 3) to evaluate the potential impact of a cash transfer policy (Sandoval and Carpio, (2017).

Guatemala continues to have the highest rate of chronic malnutrition in the western hemisphere, reporting 49% of the nation being malnourished. Child chronic malnutrition is even more devastating, plaguing 69% of the indigenous Guatemalan children. Since little progress has been made on these statistics since 1995, at this rate, it would take 83 years to eliminate stunting within the indigenous population (Fao.org. (2006). The Right to Food).

Conflicts and civil wars has been on the rise (Kaldor, 1999) and countries in Latin America face no extraordinary exception (Chomsky, 1999). As part of the history in Guatemala, the country had thirty-six years of conflict. From the 1960s to the mid-1990s, Guatemala was riven by domestic warfare between leftist guerrilla forces and militarized governments, whose main victims were indigenous people. However, The Historical Clarification Commission established in 1998 with the Peace Agreements estimated that, during the armed conflict, 42,000 human rights abuses were committed, including 626 massacres ("clearing the land") with 200,000 confirmed victims. With a few exceptions, these cases have still not been investigated. The conflict forced an estimated 400,000 people to flee the country. The armed conflict was brought to an end in 1996 with the signing of the Peace Agreements drawn up with UN support (UNGA, 2005).

Applying this concept in Guatemala as the biggest country in Central America. Guatemala won its independence in 1821 after three centuries as a Spanish colony. The

Maya civilization flourished in Guatemala during the first millennium. Guatemala is in Central America bordered by Mexico on the north and west, El Salvador on the south, and Honduras and Belize on the east. It has a surface area of 108,889 square kilometers, two thirds of which is mountainous, with dense jungles in the north and fertile plains on the coast. Of the 13.22 percent arable land, 5.6 percent is used for permanent harvesting (CIA, Factbook, 2017).

In Guatemala, The country's large indigenous population is disproportionately affected. Despite of that, the country had experienced a variety of military and civilian governments, as well as 36 years with an internal guerrilla war ((Minority Rights, n.d.)⁶ In 1996, the government signed a peace agreement formally ending the internal conflict, which had left more than 200,000 people dead and had created, by some estimates, about 1 million refugees.

Historically, the indigenous population has been marginalized from the country's political process. From the 1960s until the mid-1990s, guerrilla forces and military governments were locked in an armed conflict whose main victims were the indigenous people. An "Agreement for a Firm and Lasting Peace" was signed in 1996 between the Government of Guatemala and the Guatemalan National Revolutionary Union. The United Nations, especially UNDP, played an important role in the achievement of peace and in the efforts to implement the Peace Agreements, particularly with the United Nations Verification Mission in Guatemala (MINUGUA, 1994-2004). The Peace Agreements envisaged a solution to the structural problems at the root of the armed conflict. They addressed a wide range of issues, such as poverty, inequality, food and

⁶ ((Minority Rights, n.d.) <https://minorityrights.org/minorities/maya-2/>

employment instability, education, healthcare, basic social services, human rights violations and impunity (Fao.org. (2006). The Right to Food).

One of the main issues in this country is the lack a general land registry covering as a significant part of the country because of the opposition of large estate owners have increased power and control of illegal entities such as drug traffickers and gangs. So, with these factors, we can say that Guatemala has been suffering food insecurity for decades although the agriculture system is doing great in terms of production, the people internally is living in poor conditions.

The current situation in Guatemala is the lack of opportunities, but also people are unemployed, plus the lack of infrastructure make the situation very difficult for people adding another situation, migration. People in my country cannot get access to meat very easy, they usually eat meat (chicken, pork, sheep or beef) one a week or one every two weeks. Otherwise, people's diet are based on rice, potato, grains such as peas or beans but tortillas and corn. Most of the time farmers works for a landowner and they sometimes request to the employee to pay a fee. The government had implemented specific program to end hunger and poverty but the internal situation is not easy. Corruption is the main problem in the country plus the lack of financial resources. The good thing about Guatemala is the aid is getting from the U.S. or NGOs, and international organizations who are always in the country trying to help the vulnerable community, women, girls, and children. Lack of education in girls is another issue, women start to get pregnant when they are 12 or 14 years old; which is alarming because these babies cannot be strong enough due to the level of malnutrition from these girls plus their undeveloped bodies. Interview with Maria Esther Bucaro, native Guatemalan working for Counterpart International, NGO based in the U.S.

However, Guatemala is still one of the countries with highest poverty levels worldwide, with 54% of the population living below the poverty line in 2006 and 54% in 2011. The literacy rate of Guatemalans over the age of 15 is just 75% - apart from Haiti, this is the lowest literacy rate in the Western Hemisphere. Changing Guatemala's future means investing in the education of its youth. As a predominantly poor country that struggles in several areas of health and development, including infant, child, and maternal mortality, malnutrition, literacy, and contraceptive awareness and use. Guatemala is the most populous country in Central America and has the highest fertility rate in Latin America. It also has the highest population growth rate in Latin America, which is likely to continue because of its large reproductive-age population and high birth rate. Almost half of Guatemala's population is under age 19, making it the youngest population in Latin America.

Guatemala continues to face many other challenges as insecurity, high rates of violence, and increasing rates of poverty and malnourishment. Guatemala remains a major transit country for cocaine and heroin trafficked from South America to the United States. Although Guatemala recorded record drug seizures in 2016, the lack of law enforcement and the collusion between corrupt officials and organized crime in many areas enable trafficking of illicit drugs, precursor chemicals, weapons, people, and other contraband. During Morales's first year, his administration improved tax collection, and the interior ministry reported a 5% drop in homicide rates.

Public-sector corruption in Guatemala is endemic, cronyism is rampant, and the tumult of political transition at national and local levels every four years undercuts longer-term programming across sectors. The government levies among the lowest tax bases in the

region, thwarting well-intentioned strategies even where they do exist with a lack of minimal resources. Land and natural resources are increasingly concentrated in the hands of a small cadre of elites. Guatemala failed to meet most of its Millennium Development Goals. Nationwide, nearly two-fifths of Guatemalans receive financial remittances from migrants working abroad as domestic employment prospects for the landless and uneducated remain bleak (Data, Country Profiles, UNICEF. (2019).

Moreover the analysis exposes a very large differentials in the prevalence of child malnutrition among children of different socioeconomic and geographic groups. Malnutrition is concentrated among the poor, the least educated households, the rural population, and indigenous people. Only 16 percent of children in the richest quintile of households (in terms of per capita consumption) are chronically malnourished. The corresponding proportion is 62 percent among children in the poorest quintile (Marini and Gragnolati, World Bank 2003). Only 20 percent of children whose mother or father have more schooling than primary education are stunted. The corresponding figure is three times as high among children whose parents did not complete primary education (60 percent). The prevalence of stunting is 31 and 50 percent in urban and rural areas respectively. The prevalence of chronic malnutrition is almost twice as high among children of indigenous families (58 percent) as among children of non-indigenous families (32 percent).

Following the socioeconomic measure, the principal determinants including a conversely poverty boost malnutrition by reducing an individuals' access to food increasing the exposure to disease. In Guatemala, 64% of extremely poor and 53% of all poor children are stunted while the corresponding figure of the non-poor is 28% (Marini and

Gragnotati, World Bank 2003). But not only that the level of education has a positive impact of parents' education on child. The education can reflect a greater ability to acquire information; education is also having huge effects by bringing into the individual more income and greater self-confidence. Another stage of that is the highest levels of fertility rate and the lack of knowledge of birth control methods, especially in poor and rural communities. As a result of this the pregnancies at a young age, high number of children and short intra-birth intervals are associated with child deficient growth patterns. Finally the availability of infrastructure such as piped water, flushable toilets television poor and garbage collection system affected the nutritional status of children.

The root causes of and factors contributing to malnutrition are complex and multidimensional, and include: poverty, underdevelopment, unemployment and low socio-economic status in both rural and urban areas, often aggravated by the impact of conflict, post conflict and humanitarian emergencies and protracted crises, including natural disasters.

Guatemala stands out as having an inordinately high rate of poverty for its level of per capita GDP. According to the most recent estimates, 56 percent of Guatemalan families lived below the poverty line in 2000, which is defined as having insufficient income to purchase a basic basket of goods and services. Among these, 16 percent were in extreme poverty, which means that they could not afford a simple basic basket of food. These two figures are higher for the indigenous sub-population—76 percent and 27 percent respectively. The ENCOVI 2000/INE, based on nationally representative cross-sectional data, gathered anthropometric data on all individuals. It reveals that the prevalence of stunting (low height-for-age) among

Guatemalan children under the age of three in 2000 (44 percent) was the highest in Latin America.

Inequity and inequality, poor infant and young child feeding and care practices, poor sanitation and hygiene, lack of access to education, quality health systems and safe drinking water, foodborne infections and parasitic infestations, ingestion of harmful contaminants due to unsafe food production or preparation practices.

The World Bank highlighted poverty into 59.3% in 2014. Of all people living in poverty in the country, 52 percent are indigenous. Economic growth is not easy because the policies are pro-poor, however if we accelerated the growth it will be crucial to achieve the country's medium-and long-term social objectives. On November 18, 2016, the World Bank Group Executive Board approved the new Country Partnership Framework (CPF) for 2017-2020, whose pillars are fostering inclusion of vulnerable groups and addressing bottlenecks to sustainable growth. (World Bank, 2016).

According to the Human Development Indices and Indicator by UNDP. The human development index (HDI) measure for assessing long-term progress three basic dimensions of human development; a long and health life, access to knowledge and a decent standard of living. A long healthy life is measured by life expectancy. Standard of living is measured by Gross National Income (GNI) per capita expressed in constant with the purchasing power parity (PPP) conversion rates. Based on that, Guatemala's HDI value for 2017 is 0.650. Guatemala's GNI per capita increased by about 45.7 percent between 1990 and 2017. Based on that, the HDI falls to 0.467, a loss of 28.2 percent due to inequality in the distribution of the HDI dimension indices. Nicaragua and Honduras

show losses due to inequality of 22.9 percent and 25.6 percent respectively. The average loss due to inequality for medium HDI countries is 25.1 percent and for Latin America and the Caribbean it is 21.8 percent. The Human inequality coefficient for Guatemala is equal to 27.7 percent.

Proper nutrition in the first 1,000 days of life, from conception to two years of age, is critical in optimizing physical and cognitive growth. Failure to receive adequate nutrients during this period has irreversible affects, including immune complications, inadequate brain development, greater risks for chronic diseases during future life stages, and physical stunting and wasting (Thurow, 2016).

Chronic malnutrition includes handful of classifications beneath it, including stunting, wasting, and obesity. Body mass index (BMI) is commonly used to classify overweight and obese patients, but can be misleading due to the undistinguished differentiation of adipose tissue and muscle weight. (Aly's paper, 2017).

According to the Massachusetts Nutrition Survey (1983). A food security status was generated in this study based on the respondent's number of affirmative answers to the distributed survey. Food insecurity is classified into four categories: food secure, mildly food insecure, moderately food insecure, and severely food insecure. The food security status determined in this study was run against other "criterion" that might be linked to food insecurity. A strong correlation between the two measures indicates criterion validity

The history of the constitution is Guatemala has several previous; latest adopted May 31st 1985, effective January 14th 1986; and suspended and reinstated in 1994 (CIA, Factbook,

2017). The main amendments: proposed by the president of the republic, by agreement of 10 or more deputies of Congress, by the Constitutional Court, or by public petition of at least 5,000 citizens; passage requires at least two-thirds majority vote by the Congress membership and approval by public referendum, referred to as "popular consultation"; constitutional articles such as national sovereignty, the republican form of government, limitations on those seeking the presidency, or presidential tenure cannot be amended; amended 1994 (CIA, 2018).

The right for food has recognized in the Constitution in all three countries included in this research paper. For prevention of micronutrient deficiencies, some countries had established, by law, a national council on micronutrients or food fortification, and passed comprehensive policies and national norms or guidelines for the distribution of micronutrient supplements or mandatory food including labeling and nutrition facts.

The prevalence of underweight children (low weight-for-age) in Guatemala was 22 percent, the highest in Latin America. The prevalence of wasting (low weight-for-height), however, was very low (2.8 percent). Since malnutrition is a cumulative phenomenon, malnutrition rates, as measured by the three different indicators (stunting, wasting, and underweight), increase with children's ages (Gragnotati, M. (2002).

According to Marina Ari in "Malnutrition and Poverty in Guatemala" the prevalence of stunting of children of ladino (non-indigenous) families is about 33 percent, while it is almost 60 percent among children of indigenous families. In particular, among the different ethnic groups, children from Mam and the other Mayan families appear to be most disadvantaged; the prevalence of severely stunted children among these groups averages around 40 percent. The risk of malnutrition increases during this period,

especially if children come from large and poor families, because the babies may not get enough nutrients from the food they are given, either because they are not given enough food or because the food they are given is of poor quality.

How is the country working with the SDGs?

In September 2015, Member States adopted the 2030 Agenda for Sustainable Development committing to achieve a comprehensive, far-reaching and people-centered set of universal and transformative Sustainable Development Goals (SDGs) and targets, indispensable requirements for sustainable development. They placed high priority on addressing malnutrition by committing to all the SDGs³, in particular under SDG 2 to “End hunger, achieve food security and improved nutrition and promote sustainable agriculture”. Member States further committed, under targets 2.1 and 2.2, “By 2030, [to] end hunger and ensure access by all people, in particular the poor and people in vulnerable situations including infants, to safe, nutritious and sufficient food all year round” and “By 2030, [to] end all forms of malnutrition, including achieving by 2025 the

In April 2016, the UN General Assembly, through its Resolution 70/2594, endorsed the ICN2 outcomes and proclaimed 2016 to 2025 the United Nations Decade of Action on Nutrition (“Nutrition Decade”). The Resolution also called upon the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) “to lead the implementation of the United Nations Decade of Action on Nutrition in collaboration with the World Food Program (WFP), the International Fund for Agricultural Development (IFAD) and the United Nations Children's Fund (UNICEF), and to identify and develop a work program based on the Rome Declaration and its Framework for Action, along with its means of implementation

for 2016-2025, using coordination mechanisms such as the United Nation System Standing Committee on Nutrition (UNSCN) and multi-stakeholder platforms such as the Committee on World Food Security (CFS), in line with its mandate, and in consultation with other international and regional organizations and platforms.”





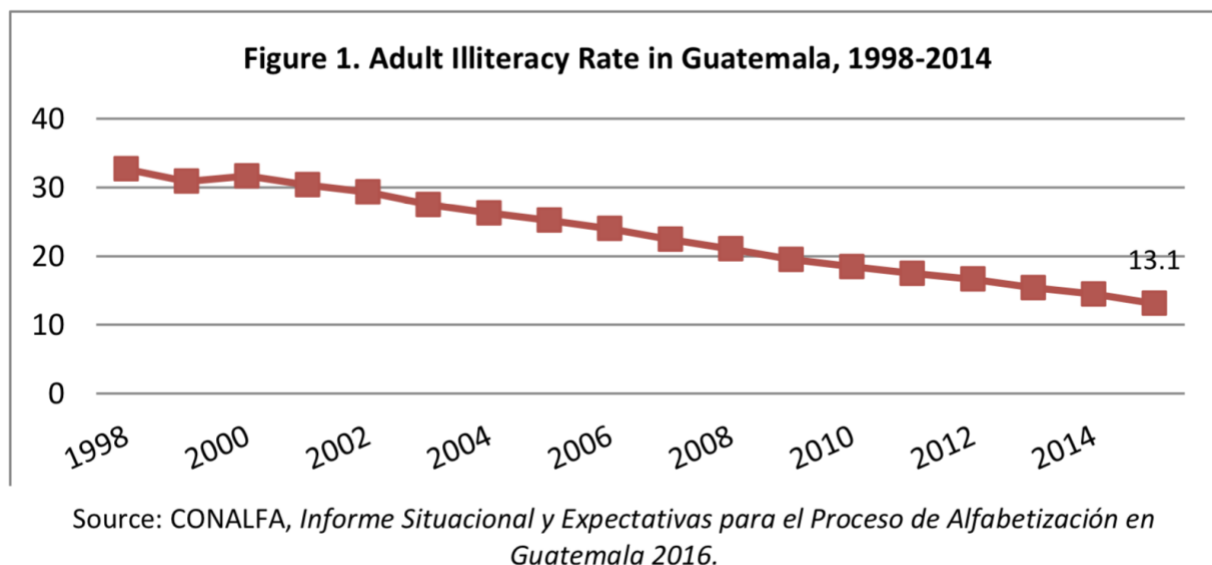
Everywhere, the consumption of vegetables, legumes, fish, nuts, seeds and fruits is much below that recommended by the World Health Organization (WHO). Meanwhile, people are consuming too much fat, processed meat, salt and sugary drinks.

Although 795 million people are undernourished and lack essential vitamins and minerals, obesity is behind many of the chronic diseases that are sweeping the globe, from type 2 diabetes to heart disease. One in three people is malnourished. Almost one-quarter of children under five have stunted growth, with diminished physical and cognitive capacities.

Responding to the this call, in Guatemala case study, the Sustainable Development Global Goals should get measured in a different way, but also the government needs to get them done so the public who is the watchdog can also get seen.

Less than 30 years ago, in 1986, more than half of the Guatemalan population (52%) was illiterate. That year, President Vinicio Cerezo established a decentralized educational system and granted more autonomy to departments and schools themselves. The constitutional reforms of that period also extended compulsory education to the 9th grade (or third grade) and made curricular changes to integrate intercultural and gender-related content.² Today, the General Office of Bilingual Education (DIGEBI) works in more than 1,400 schools covering 14 different linguistic groups.

In turn, Guatemala has experienced improvements in literacy (Figure 1). However, Guatemala still ranks among the lowest in literacy. In 2014, for example, 19% of the adult population (15 years and older) was illiterate, compared to 7% in the Latin America and Caribbean region. (Manuel Orozco and Marcela Valdivia , 2017, Inter-American Dialogue)



The educational landscape presented thus far has important implications for development. As stated earlier, education has significant consequences for the composition and skills of the labor force, the ultimate driver of economic growth. Further, education provides the necessary skills to access high-quality jobs and reduce inequality, and particular sectors, such as science and technology, promote innovation and the development of new technologies.

Trade and Programs with the United States, relation between food and agriculture

Approximately 50% of Guatemalan children younger than five years of age are stunted due to chronic food insecurity. Within indigenous areas, nearly 70 percent of the population is chronically malnourished. Agriculture means crops, livestock, forestry and fisheries. Poor rainfall has resulted in several years of poor harvests, which have led to limited agricultural production, lost labor opportunities and reduced household

incomes, making it more difficult for vulnerable families to access enough nutritious food.

Recent periods of dryness in the eastern and western regions of Guatemala has resulted in decreased corn and bean crop production, forcing households to purchase staple foods from markets earlier in the year than usual, according to the Famine Early Warning Systems Network (FEWS NET). In addition, poor households in the Dry Corridor are still struggling to recover from indebtedness and a loss of assets due to consecutive years of low agricultural production. As a result, Dry Corridor communities in Guatemala—currently facing Stressed (IPC 2) levels of acute food insecurity—are projected to likely face Crisis (IPC 3) levels by February 2019, according to FEWS NET.

The Central America Free Trade Agreement (CAFTA) is an expansion of NAFTA to five Central American nations (Guatemala, El Salvador, Honduras, Costa Rica and Nicaragua), and the Dominican Republic. It was signed May 28, 2004 and passed through the U.S. House of Representatives by one vote in the middle of the night on July 27, 2005 (Citizen.org. (2019). Central America Free Trade Agreement (CAFTA) | Public Citizen).

The U.S. Department of Agriculture (USDA) was well-established in Guatemala before the launch of Feed the Future. Its programming has largely focused on trade with the United States through the Dominican Republic-Central America Free Trade Agreement (CAFTA-DR):³ the value of bilateral agricultural trade between the United States and Guatemala was estimated at \$3 billion in 2015, nearly two-thirds of which were U.S. imports.

Feed the Future/Guatemala has contributed to a number of prominent successes in the agricultural and nutrition sectors. In FY 2016 alone, the value of total sales attributed to Feed the Future work in the coffee sector summed to nearly \$32 million. Horticultural sales exceeded \$15 million, a 150 percent increase from just the previous year.¹ The U.S. Agency for International Development (USAID) estimates that expanded production and commercialization has led to the creation of over 20,000 new jobs. On the nutrition side, it reports that roughly 249,000 children under five have been reached by nutrition interventions.

McGovern-Dole programming reaches vulnerable children in 859 Guatemalan school communities. While agricultural commodities entering Guatemala through the Food for Peace program have declined precipitously in recent years, commodities imported through Food for Progress have simultaneously quadrupled. When Food for Peace, Food for Progress, and McGovern-Dole contributions are jointly accounted for, more U.S. commodities were injected into the Guatemalan economy in 2014 than in 2010 (Berkman, J. (2001). Berkman, J. (2001). Foreign Aid to End Hunger. [online] Files.hungerreport.org. Available at: <http://files.hungerreport.org/reports/hunger-2001.pdf> [Accessed 13 Mar. 2019].

“The lack of food security contributes to political instability. Countries like Guatemala and Colombia are currently working with programs, such as McGovern-Dole Food for Education and Child Nutrition Program but also Food for Peace Program and Feed the Future. Most of them are working with small farmers and governments to increase agricultural production and strengthen local and regional markets in order to reduce hunger and grow economies. However, the program McGovern-Dole Food for Education has proven to be especially effective at convincing families to send their daughters to school providing meals for children when they are at school learning new stuff, developing their brain to be

professionals in the future and contribute to the system. Food security and agriculture depend of the intensive work that politicians and government can do. Sometimes, it is hard due to the corruption or lack of resources in these countries. We need to be able to connect these dots and have the ability to bring access to food for everyone. Agriculture demand and technology move and expand the system. That is another type of responsive that can produce more food in a different way. Countries like Colombia who has suffered from conflict, poor government creating food insecurity is making a lot of changes and improving the system. Nevertheless, each country has its own challenges but I am sure that if we work together we can have affordable and accessible food for everybody” Congressman Jim McGovern, Interview with Congressman Jim McGovern in her office, last summer 2018.

In response to that situation and according to USAID, Food Assistance Fact Sheet in response to the drought crisis, USAID’s Office of Food for Peace (FFP) supports Save the Children to provide cash transfers for food to 4,000 food-insecure households in the Dry Corridor’s Quiché Department, enabling families to purchase nutritious foods available in markets while supporting local economies and agricultural producers. This program also provides vulnerable households with training on agricultural best practices, livelihoods strategies and nutrition.

In addition, FFP partners with Catholic Relief Services (CRS) to provide cash transfers for food to approximately 4,500 food- insecure households in the Dry Corridor’s Chiquimula, El Progreso and Zacapa departments, as well as training aimed at increasing agricultural production and livelihoods opportunities, improving financial literacy and preventing malnutrition (USAID, 2018)⁷.

⁷ https://reliefweb.int/sites/reliefweb.int/files/resources/FFP%20Fact%20Sheet_Guatemala_09.30.18.pdf

Finally, FFP supports two multi-year development programs that empower communities to strengthen food security and resilience to shocks. Both programs are scheduled to continue until December 2018. Part of that depends on the government who should take action, targeted and concerted them in the areas as health, education, nutrition and better access to food. These actions are needed to accelerate the decline in the prevalence of chronic malnutrition. Although it should be right to say the government needs to get more funding and create strategies in parallel with programs that address different aspects of malnutrition. So, for instance, the government has tried to integrate its actions in different sectors with the aim of guaranteeing adequate amounts of food and ensuring the conditions necessary for a healthy lifestyle. However, so far, these different programs have only had a very limited effect.

One of the fact is involve with 570 million farms on the planet, 90 percent are family farms and about 72 percent small farms. Family farms produce most of the world's food but also house the majority of its poor and hungry. Highlighted malnutrition takes different forms including undernutrition (underweight, stunting and wasting); micronutrient deficiencies; and overweight and obesity. These forms of malnutrition affect all countries, whether developed or developing and can also co-exist within countries, communities, households and individuals. (GAIN Report, 2017, Nutrition and Food System)⁸.

2016 World Food Prize Laureates Drs. Jan Low, Maria Andrade, and Robert Mwanga of the International Potato Center (CIP) and Howarth Bouis of Harvest Plus for their work

⁸ GAIN Report, 2017, Nutrition and Food System (<http://www.gainhealth.org/wp-content/uploads/2017/09/HLPE-12-Nutrition-and-food-systems.pdf> / Pag 12)

on biofortified crops to reduce hidden hunger and specifically vitamin A deficiency (VAD), one of the most pernicious forms of undernourishment in the developing world.

Vitamin A deficiency causes blindness, limits growth, weakens immunity, and increases mortality. Afflicting over 140 million preschool children in 118 countries and more than seven million pregnant women, it is the leading cause of child blindness in developing countries. Between 250,000 and 500,000 vitamin A-deficient children go blind every year, half of them dying within 12 months of losing their sight. VAD also weakens the immune system in under-fives, increasing their risk of dying from diarrhea, measles and malaria by 20–24 percent.

The CIP and HarvestPlus team set out to prove that the local people in Sub-Saharan Africa would accept biofortified Orange Fleshed Sweetpotato (OFSP) into their diets, that vitamin A deficiency could be prevented by eating it, and that countries would adopt it. In this they have succeeded. Biofortified sweetpotato is firmly on the menu of 14 countries in Africa but also Latin America region is working on the same project with the idea to improve nutrition of hundreds of thousands of children and food security of the entire family.

Chapter II

Case Study of Colombia and Brazil – Food Security and Agriculture

In this chapter, we want to highlighted Colombia and Brazil as a case study but also as a model for Guatemala due to the emerging economies and as developing countries. However, the intention is not to say that these countries are doing great in terms of food security, and agriculture system. Because, each country in the world is facing this overweight or obese mother with a stunted child – a widespread condition in many Latin American households, with a prevalence of up to 20% in Guatemala. Latin American countries, stunting prevalence is the highest in Guatemala (48%), with countries such as Brazil and Colombia between 10% and 14%.⁷ An estimated 4 million children in Latin America and the Caribbean are stunted, 1 million wasted and 6 million overweight.

In order to make any empirical use of the concept of inequality of opportunity, whether in the design of taxation and public expenditures or in the study of the determinants of cross-country growth differences, it is first necessary to measure it. Some progress in that direction has been made. Bourguignon et al. (2003, 2007) parametrically estimate inequality of opportunity for various cohorts in Brazil, in 1996. For the Food and Agriculture Organization of the United Nations (FAO) defines food security as a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that should meet their dietary needs. So, when we expose Colombia and Brazil as a case study is a result of the issues of food security including food availability, food access, utilization and stability.

Food means adequacy, availability and accessibility. These three dimensions are critical for the development of indicators and framework. The concept of “adequate” food has three components. First, food should be available in a quantity and have nutritional quality sufficient to satisfy the dietary needs of individuals. Second, the food should be safe for human beings to eat and free from adverse substances. This incorporates an element of consumer protection. Third, the food should be acceptable within a given culture.

Speaking of “availability” of food refers to a sustainable supply of adequate food, with environmentally and economically sustainable food systems. Sustainability indicates a long term availability and accessibility to adequate food. Areas critical for improving overall food availability are contained in the Voluntary Guidelines, such as land, water, agriculture, technology, extension and credit availability. International cooperation in augmenting food availability is also relevant. And “accessibility” of food suggests a stable access to adequate food. It incorporates both physical and economic access to food within the household’s livelihood. It also suggests the accessibility of food in ways that do not interfere with the enjoyment of other rights, and corresponds to the Voluntary Guidelines that are directed at improving the management of resources (FAO, Monitoring The Implementation of the Right to Adequate Food, 2009).

Brazil



Brazil, Eastern South America, bordering the Atlantic Ocean the largest country in South America and in the Southern Hemisphere; it has 8,358,140 km of land which only 32.9 per cent is agricultural land, arable land 8.6%; permanent crops 0.8%; permanent pasture 23.5%, and forest: 61.9%. (CIA, World Book (2018). It is estimated that around 58% of the population (around 360 million people) are overweight and that the obesity affects 23% (140 million). Thus, the overweight affects at least half the population of all countries except Haiti (38.5%), Paraguay (48.5%) and Nicaragua (49.4%).

Right for food is part of the constitution, it means the social policy has tended to be fragmented also in Brazil. However, the Zero Hunger Program is making a major effort towards better institutional coordination. Direct income transfer programs are being unified under the Bolsa Familia programs, under which low-income families are eligible for the monthly benefits of various programs, on a case by case basis. One of its main programs, the “cartao alimentação” (food card) diverges from traditional policies of

supplying basic food baskets to fight hunger, by linking consumers with low-purchasing power and small-holder food producers. The programs will be decentralized, with state and municipal government playing an active role Fao.org. (2006). The Right to Food.

Overweight in the region has been increased from 63% to 69%, respectively. In the same way, that the proportion of women with obesity times more than men, and in more than 20 countries difference is 10 percentage points higher. Per example, in Antigua and Barbuda obesity affects 22.8% of the population and 38.7% of women, while in Jamaica, 18.4% of men and 35.7% of women. Approximately 106,000,000 hectares (260,000,000 acres) by 2009, Brazil is historically one of the principal bases economy. Economically speaking, Brazil is the eighth-largest economy in the world, but is recovering from a recession in 2015 and 2016 that ranks as the worst in the country's history. In 2017, Brazil's GDP grew 1%, inflation fell to historic lows of 2.9%, and the Central Bank lowered benchmark interest rates from 13.75% in 2016 to 7%.

Brazil has played an important role in food production and trade. Its agricultural expansion during recent decades has resulted in an increase in food supplies to its national market and, significantly, to the global commodities trade. However, when we talk about public policies considered from a human rights perspective translate into a development approach in which the obligation to achieve universal human rights for all is the starting point, the situation could be different.

At the national level, food availability in Brazil is more than sufficient for its entire population. Domestic production of food, plus imports and minus exports, results in food availability per capita (in grain equivalent) of more than 340 kg per capita per year: about

one third more than the per capita nutritional requirements. Lack of access to food, therefore, is not the result of lack of food availability, but due to the inability of poor Brazilians to afford food. The Brazilian government has a range of programs in place that attempt to deal with this problem.

According to Bauhinia and Da Silveira (2002), the calories available for daily consumption are, on average, sufficient to feed all Brazilians. The main issue is that extreme social and economic inequalities combined with household wastage/losses can reduce this amount to an unacceptably low value. This mainly affects poor people, who often simply cannot afford to buy sufficient food. Buainain and Da Silveira (2002) mentioned:

A cursory analysis of the Brazilian food balance sheets shows several interesting facts. Food consumption in Brazil is changing, and the pattern of change is clearly perceptible. The average energy supply grew from 2,408 calories per day in 1970 to 2,938 in 1996, increasing at an annual rate of 0.77 percent This suggests a steady improvement in nutritional status for the average Brazilian. Mean individual requirements (account taken of gender-age composition) are about 2,200 calories/day, and the average supply in 1970 (only 2,408 calories) would seem insufficient once thought is given to household losses (some 10%) and inequalities between lower and higher income groups. A supply of 2,938 calories per day would seem safer (though of course a significant proportion of Brazilians is still unable to meet their needs).

The market share of Brazilian imports for this period has decreased for dry beans (from 10.82 to 3.25 per cent), maize (from 2.38 to 1.02 per cent), rice (from 6.1 to 2.39 per cent), soybeans (from 2.15 to 0.13 per cent), refined sugar (from 0.0003 to 0.0002 per cent) and

wheat (from 6.03 to 5.57 per cent). In the same period, trade exports have increased for dry beans (from 1.85 to 30.85 kilotons), maize (from 7.17 to 10,933.46 kilotons), rice (from 6.61 to 201.48 kilotons), soybeans (from 9,274.75 to 23,733.78 kilotons), refined sugar (from 3,575.27 to 6,925.80 kilotons) and wheat (from 4.19 to 104.48 kilotons). Imports have only decreased for paddy rice (from 0.133 to 0.125 kilotons). (Alessandro Peduto, W. (2010).

Domestic production of food, plus imports, minus exports result in per capita food availability (in grain equivalent) of more than 340 kg per capita per year, about one-third more than per capita nutritional requirements. Brazil's average per capita calorie availability grew steadily over the last three decades at an annual rate of 0.7 percent; it reached 2,985 in 2000 (Constanza Valdes, B. (2016).

This mechanism reduces risks for crop producers during the harvest and is an important mechanism to reduce the price volatility that is intrinsic to the agricultural sector. When prices fall below the minimum level established by government, measures are taken such as buying crop surpluses from small farmers, prices equalization and financing the building up of stocks of selected crops. The minimum guaranteed price for crops considered to be regional and summer harvests is defined by government. This policy is aimed at achieving economic growth, increasing farmers' income and increasing the competitiveness of crop exports, when applicable.

The minimum price guaranteed is aimed at reducing or transferring to the wider society the uncertainty over prices faced by small-scale farmers. When fixed properly, minimum prices correctly anticipate market prices for producers, reducing the level of uncertainty

for both producers and consumers and allowing the better allocation of productive resources (De Aguiar & Pinho, 1998).

Brazil has approximately 340 million hectares of arable land, of which less than 1 percent is used for sugar cane production, but almost 3 percent for soybean production and almost 40 percent for pasture. If proper development and law enforcement policies were put in place, such as land use zoning, increased agriculture productivity in Brazil might simultaneously reduce the pressure to develop new land areas for agricultural production and increase the amount of food produced without negative impacts on the environment or food security (Antonio Neves, (2010) The Brazilian Case).

The Brazilian Enterprise for Agricultural Research (EMBRAPA)⁹ established during the military regime in 1973 with the objective of diversifying production. The body was responsible for the support of new crops, adapted to the country's diverse regions. The expansion of agricultural borders towards the Cerrado had begun, and of monocultural latifundia with production at a semi-industrial scale of soybeans, cotton and beans. Czech-Brazilian researcher Johanna Döbereiner helped lead Brazil's Green Revolution, winning her the UNESCO Science Prize for her work on nitrogen-fixing microorganisms.

In 1960 four main agricultural products were exported, growing by the early 1990s to nineteen. Brazil also moved "downstream" to expand post-harvest processing. In the 60's unprocessed goods made up 84% of total exports, falling to 20% by 1990. On the export commodities: transport equipment, iron ore, soybeans, footwear, coffee, automobiles

⁹ <https://www.embrapa.br>

Exports partners including China 21.8%, US 12.5%, Argentina 8.1%, Netherlands 4.3% (2017).¹⁰ Agricultural promotion policies included subsidized credits, bank debt write-offs and exports subsidies (in some cases, reaching 50% of the product value. (Angelo, G. (2007). Trade Agreements and Their Impacts on the Familiar Agriculture in Brazil).

The agriculture in Brazil is developing specific applications of technological and intentional innovations. As well, they have been empowering a cooperation with Japan. These efforts continued through the establishment period where the activities of the Brazilian Agricultural Research Corporation (EMBRAPA) were essential for this technological innovation.

EMBRAPA Centers specialized in specific agricultural crops and livestock production. The technological innovation, agriculture to scale up, diversify, and develop are part of that agroindustry value chain. So, analyzing the facts and the way how EMBRAPA works, the success reveals as part of how to develop organizations capable but also at the same time how can generate technological innovation, develop human resources, and produce outstanding results match with that excellent young researchers who are trained and contributed every day with creative work (World Bank, (2013).

Food basket in Brazil despite the challenges, it's being improving. Food retailers have been less affected than other segments of the economy. The crisis led consumers to eat more at home, which helped sustain retail sales. In addition, many consumers had to adapt purchases to the economic scenario, which pushed the food industry to redesign

¹⁰ <https://www.cia.gov/library/publications/the-world-factbook/geos/br.html>

packages and the growth of “cash & carry” store formats. 55% of the stores in Brazil are small businesses (USAD-FAS, 2016)¹¹.

The grains are part of the dry grocery which included in the healthy food basket are rice, wheat, and corn; fat is represented by cooking oil and protein consumption is ensured by including meat—mostly beef and poultry—and milk. In 2015, the latest full year data available, supermarket sales amounted to R\$315.8 billion (US\$94.5 billion), or 5.35 percent of Brazil’s GDP of R\$ 5.9 trillion (US\$ 1.8 trillion). Despite nominal growth of 7.1 percent, this year was the first in a 13-year series where the ABRAS retail index presented a retraction. With double digit inflation of 10.67 percent, supermarket sales figures shrank by 3.25 percent in real terms, demonstrating that employment and income still have a direct correlation with supermarket sales.

For instance, Belo Horizonte as the capital of Minas Gerais state. It is Brazil’s sixth largest city, with a population of more than 2.5 million. While the city itself is 100 percent urban, it forms the core of the Belo Horizonte Metropolitan Region, which comprises urban and rural areas, reaching a total population of more than 5.7 million. Like other Brazilian cities, Belo Horizonte suffered high rates of poverty and hunger in the early 1990s, with almost 38 percent of families in the metropolitan region living below the poverty line. In 2003 the Federal Government launched its Zero Hunger program, with the objective of eradicating hunger and fighting poverty.

¹¹ https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Retail%20Foods_Sao%20Paulo%20ATO_Brazil_12-29-2016.pdf

By 2013, Belo Horizonte's Food Bank acts upon the reception of food that no longer fits in the commercialization patterns, but keeps its nutritional properties unchanged, presenting no risk to human consumption. By means of partnerships with grocery stores and supermarkets, the food is received, selected, processed (if necessary) and distributed freely to non-profit civil societal organization, which in turn prepare and distribute free meals to individuals in social vulnerability situation. Currently, 20 metric tons of food per month pass through this process via 36 partner institutions, which in turn provide meals for approximately 6 000 people.

In addition, in terms of the impacts of inflation on food prices, Brazil performed better than other countries, because it has an environment and a sophisticated economy that allowed it to fulfill domestic demand for food and expand its agricultural trade. During the food price crisis, Brazilians continued to consume at much the same level as previously, stimulated by socioeconomic improvements and higher incomes. At the same time, Brazil has played an important role in global food production and the global commodities trade.

Colombia

Colombia is a developing country found upon the northwest apex of South America (United States Central Intelligence Agency [CIA], 2014). Economically, Colombia ranks 29th in the world (CIA, 2014), earning 8,009 USD in nominal gross domestic product (GDP), and 8,031 USD per capita GDP nominal (Banco de la República [BDLR], 2014).



Colombia serves as a valid model to monitor food security secondary to the distinctive conditions inherent to human translocation due to an ongoing civil war, or internal conflict (Internal Displacement Monitoring Centre [IDMC], 2013). Despite a robust economy and a favorable finance classification by the World Bank (2013), volatile public safety concerns are often further exacerbated by the pestilence of narcoterrorism and pervasive violence (Holmes, Gutiérrez de Piñeres, & Curtin, 2008), which still distresses the nation. These contradictory affirmations still ensures that Colombia can remain an ideal locus for both international commerce and foreign investments with limited risk (World Bank, 2013), with contemporary metrics suggesting the strongest within Latin America (Proexport, 2013).

Current GDP (BDLR, 2017) indicated a \$314.5 B USD in strength. Paired with a robust 498 B USD GDP purchasing power parity (PPP), and a GDP per capita PPP of 14,400USD (International Monetary Fund [IMF], 2017), the nation experienced a GDP growth of 1,8% (CIA, 2017). By preserving 11 free trade agreements (FTA) with 84 countries reaching 1.5

billion consumers, Colombia exceeded the cumulative growth for the world economy was 3.3% and 3.0% for of all Latin America (Proexport, 2013).

The strength of the commodities measured by GDP composition by sector of origin is divided by agriculture (7,2%), which enjoys a production growth rate of -2.2%, securing a world ranking of 185, accompanied with 17% of the labor force (CIA, 2017). Chief agriculture products include coffee, cut flowers, bananas, rice, tobacco, corn, sugarcane, cocoa beans, oilseed, vegetables; shrimp, and forest products (CIA, 2017). The unemployment rate in Colombia is 9,3% by 2017 and the population below poverty line 28% (CIA, 2017).

As part of the productive and economical sustainable in the country, the agriculture products are part of the system are cocoa beans, different kind of vegetables like onions, cassava, potatoes, fish culture including shrimp, and an exotic variety of fruits including papaya, pineapple, melon, passionfruit, mango, guava, etc. In Colombia the agricultural politics and policies are determined by the Ministry of Agriculture and Rural Development (Minagricultura.gov.co. (2015). OECD Review of Agricultural Policies Colombia).

Colombia is Latin America's fourth largest oil producer and the world's fourth largest coal producer, third largest coffee exporter, and second largest cut flowers exporter. Colombia's economic development is hampered by inadequate infrastructure, poverty, narcotrafficking, and an uncertain security situation, in addition to dependence on primary commodities (goods that have little value-added from processing or labor inputs).

Colombia's economy slowed in 2017 because of falling world market prices for oil and lower domestic oil production due to insurgent attacks on pipeline infrastructure. Although real GDP growth averaged 4.7% during the past decade, it fell to an estimated 1.8% in 2017. Declining oil prices also have contributed to reduced government revenues. In 2016, oil revenue dropped below 4% of the federal budget and likely remained below 4% in 2017. A Western credit rating agency in December 2017 downgraded Colombia's sovereign credit rating to BBB-, because of weaker-than-expected growth and increasing external debt. Colombia has struggled to address local referendums against foreign investment, which have slowed its expansion, especially in the oil and mining sectors. Colombia's FDI declined by 3% to \$10.2 billion between January and September 2017.

Colombia has signed or is negotiating Free Trade Agreements (FTA) with more than a dozen countries; the US-Colombia FTA went into effect in May 2012. Colombia is a founding member of the Pacific Alliance—a regional trade block formed in 2012 by Chile, Colombia, Mexico, and Peru to promote regional trade and economic integration. The Colombian government took steps in 2017 to address several bilateral trade irritants with the US, including those on truck scrappage, distilled spirits, pharmaceuticals, ethanol imports, and labor rights. Colombia hopes to accede to the Organization for Economic Cooperation and Development (CIA, 2017).

When the Spanish conquest and colonized the country on July 20, 1810, agriculture in Colombia had started a whole ago by the indigenous people. The ancestors had developed techniques to plant numerous plants for their feeding and to produce houses and ornaments. Predominantly the indigenous people cultivated maize and managed the

Colombian climate and geography to develop planting technique using terraces. Many other plants were first cultivated in Colombia such as tomatoes, avocados, guavas, chilli peppers, manioc and prickly pear were all cultivated as additional food resources, while rubber trees and cotton plants were useful for making cultural products like latex balls and clothing.

Colombia is also another country in the western hemisphere that as part of the research has suffered for over 30 years an internal conflict, or an intense insurgency (Holmes et al., 2008) (Johnson, Mark, Dissertation on Public Health Implications Of Colombian Diaspora: Market Density as an Indicator for Food Insecurities, (2015).

This internal conflict has inundated the nation since the 1950's (Centro Nacional de Memoria Histórica, 2013), creating a formidable humanitarian crises (Mejía, 2011), which is often considered the worst in the southern hemisphere (IDMC, 2013). Outside the measured strategy to seize and control land for resources, the forced migrations have also been described as a mechanism to weaken armed adversaries (Engel & Ibáñez, 2007) by procuring insurgent staging areas, among other prospective guerrilla / paracos enterprises (Leech, 2009). Far too often, commandeered rural properties often become appropriated for narco development, such as coca production (Bergquist et al., 2001; Streatfield, 2001), which produces sizeable profits and value to the newly assimilated territories. (Johnson, Mark, Dissertation on Public Health Implications Of Colombian Diaspora: Market Density as an Indicator for Food Insecurities, (2015).

According to Amnesty International (2014), subjugated landowners / property caretakers are commonly exposed to unrealistic "taxes" or ransom payments to competing

antagonist groups such as rebel fighters, paramilitaries, or security forces. Estimations of land tenure by various drug cartels range from 33% of the country's agrarian land (Economist, 1994), to 42% (Knoester, 1998), a significant percentage once measured against the strength of the agricultural sector, 6.5% of total GDP (Guerrero, 2014).

This conflict has unilaterally devastated millions of victims, and throughout just 1985-2012, there were over 220,000 killed, with 25,000 forced disappearances due to the internal conflict (Centro Nacional de Memoria Histórica [CNMH], 2013). Of the dead, 80% were civilians or noncombatants. The Office of the Comptroller General, Office of Human Rights Ombudsman and the Office of the Procurator General furthermore recognized a total of 6.4 million victims of the conflict, almost half of who are women (Comisión de Seguimiento y Monitoreo a la Implementación de la Ley de Víctimas y Restitución de Tierras, 2014).

The indigenous people also were avid hunters and consumed processed local fauna, predominantly deer, rabbits, snails, fishes and birds. The indigenous also cultivated grass to use as roofs for their houses, and fique fiber to sew their clothing and artifacts. They also cultivated coca and marijuana for ceremonial purposes and local fruits and vegetables like yuca and potato for their diet. Agriculture, which was limited in the 1500s to providing subsistence for colonial settlements and immediate consumption for workers in the mines, became a dynamic enterprise in the 1600s and replaced mining as the core of the Colombian economy by the 1700s. By the end of the 1700s, sugar and tobacco had become important export commodities. The growth in agriculture resulted in part from the increasing exhaustion of mineral and metal resources in the seventeenth century, which caused the crown to reorient its economic policy to stimulate the

agricultural sector. (The Library of Congress Country Studies. (2000). Colombia The Colonial Economy).

In terms of irrigation, Colombia has 900,000 hectares of irrigated agriculture, mostly located in the warm center, Magdalena, Cauca and Tolima Valleys, and the northeast near Venezuela's border and along the Caribbean coast. 90 per cent of the agricultural land is irrigated through gravity irrigation systems. According to the Food and Agriculture Organization (FAO), 62 per cent of the functional irrigable land in Colombia has been developed and managed by the private sector. Only 38% was developed by the public sector. The private sector invested in Colombia during the period 1991-1997 on average US\$19 million per year based on FAO report. Colombia has a considerable potential to expand land under irrigation due to high rainfall and fertile volcanic soil creating conditions favorable for a wide range of crops (Library of Congress).

According to the Ministry of Agriculture and Rural Development who is the main entity in charge of the agriculture politics and policies, plant cultivation and livestock production have continuously abandoned subsistence agricultural practices in favor of technological farming resulting in cash crops which contribute to the Economy of Colombia. The Colombian agricultural production has significant gaps in domestic and / or international human and animal sustenance needs. The primary agricultural products of Colombia are coffee (fourth-largest producer of coffee in the world), cut flowers, bananas, rice, tobacco, corn, sugarcane, cocoa beans, oilseed, vegetables, fique, panela, forest products; and shrimp.

Colombia's agricultural share of GDP decreased during the 1990s by different social and cultural problems including violence and narcotrafficking. Agriculture has nevertheless remained an important source of employment, providing a fifth of Colombia's jobs (Otis, J. (2014). The FARC and Colombia's Illegal Drug Trade).

When the Spanish conquest and colonized the country, Colombian agriculture history became from the indigenous people. The ancestors had developed techniques to plant numerous plants for their feeding and to produce houses and ornaments. Predominantly the indigenous people cultivated maize and managed the Colombian climate and geography to develop planting technique using terraces. Many other plants were first cultivated in Colombia such as tomatoes, avocados, guavas, chilli peppers, manioc and prickly pear were all cultivated as additional food resources, while rubber trees and cotton plants were useful for making cultural products like latex balls and clothing.

When the Spanish people turned to violence, domination and submission of the indigenous peoples, forcing most of them into slavery based in systems like the shipping. Based on that, they introduced the mercantilist style as part of the commerce later on it Colombia intended for the production and commercialization back to Spain. The Spanish also brought new livestock such as horses, cattle, goats, birds, most of these intended for the human consumption and for commerce. It also introduced agricultural plants such as cotton, coffee, sugar cane, tobacco, tea, sorghum, wheat, with the same purpose of supplying Spain solely.

Food systems in Latin America

Every human being has the right to adequate food. Globally, one person in three is malnourished today and one in two could be malnourished by 2030 if nothing is done. Building on the international political momentum created around nutrition by the 2030 Agenda, the 2014 Rome Declaration on Nutrition and the subsequent United Nations (UN) Decade of Action on Nutrition (2016–2025), the CFS, at its 42nd Plenary session in October 2015, requested the HLPE to prepare a report on nutrition and food systems, to be presented at CFS 44 in October 2017 remains a critical concern.

While hunger, overweight and obesity are rapidly increasing all over the world, including in low- and middle-income countries. Therefore, malnutrition in all its forms (undernutrition, micronutrient deficiencies and overweight and obesity) now affects all countries, whether low-, middle- or high-income. Those different forms of malnutrition can co-exist within the same country or community, and sometimes within the same household or individual, and can even paradoxically be linked: they thus must be fought altogether.

As a consequence, hunger and malnutrition will not be “self-corrected” only by economic growth, as many people thought in the past: nor will these concerns be spontaneously addressed. On the contrary, nutrition must be integrated as an explicit objective in national policies, programs and budgets, not only in low-income but also in high-income countries. Cross-sectoral nutrition strategies should be designed and implemented at different levels, from global to local.

Globally, the prevalence of chronic malnutrition (stunting) fell from 29.5 percent to 22.9 percent between 2005 and 2016. This still leaves 155 million children under 5 facing an increased risk of impaired cognitive ability, poor school performance and death from infections. There has been an impressive decline in chronic malnutrition prevalence since 2000, when 198.4 million were affected. However, in Guatemala, Colombia and Brazil, stunting rates jumped from 25.2% in 2017. And Guatemala as high as 49.8% percent in the Western Hemisphere. But in terms of inequality, malnutrition is concentrated among the poor, the least educated households, the rural population and indigenous people. Only 20% of children whose mother or father have more school opportunities than primary education are stunted (FAO. (2018).

Nutrition is a key element for children, and it's crucial because based on that they can be able to have the highest levels of physical and mental health. However, women and children in Latin America are having big problems because of malnutrition which includes underweight, stunting, wasting and obesity. All of these factors have a negative impact on social and economic development in the country; including the ability to achieve the Sustainable Development Global Goals (UNSCN, 2015).

Improving nutrition extends beyond basic caloric needs and incorporates all forms of malnutrition including childhood wasting, stunting, micronutrient deficiencies (particularly in children, pregnant and lactating women), and obesity. Malnutrition is therefore highly relevant to all countries. The FAO estimated that 41 million Latin Americans representing 13% of the population are undernourished where 38% is from Guatemalans (FAO,2017).

Currently, explorations are underway to support the role of micronutrient supplementation efforts in traditional food retailers' with nontraditional food distribution points. These efforts can be best orchestrated with respective community leaders representing those most at need with representatives from various altruistic institutions such as NGOs and multinational corporations postured in benevolence. It remains noteworthy to determine how these modalities can position themselves in a future where food exhaustion is becoming a growing concern. Innovative measures such as hydroponics, container gardens, and micro agronomy may become the community-based remedy to local food insecurities. However, the country is behind of these practices and they just started with gardens and urban farming in a few areas, mainly in Bogotá.

The internal conflict symptomatically compels victims near the very precipice of destitution and dispossession and noncommunity ostracization tends to exacerbate and inhibit social development and thereby contracts growth (Ibañez & Vélez, 2007). This capital stunting is not isolated to the social capital of a community or society at a macro level, but also the human capital of individuals, driving a larger rift into their own competence for self-realization or conditional amelioration. These communal microaggressions traditionally aggravate and destroy the capital potential of society (Johnson, 2015).

Food security is one of the focuses combined with economic and social access to supply safe, nourishing food, consumption, and access to food. It's important to highlight the level of undernutrition in the region has been since 1990. Countries like Colombia and Guatemala used to have a violent past which created food insecurity in the region. However, for more than two decades, the countries have been working to solve the

problem in parallel with new types of health policy challenges. Nutritious foods are the product of policies, distribution networks, infrastructure for storage, research and technology, information and awareness, and consumer preferences. A number of research studies have noted the failure of these systems to ensure access to nutritious foods due to lack of nutrition awareness, adequate infrastructure, or functioning markets (Maestre et al., 2017).

As we know, Colombia, Guatemala and Brazil have a significant amount of indigenous population which according to the Economic Commission for Latin America and the Caribbean (CEPAL), the prevalence of stunting is over twice as high for indigenous children under five compared with the nonindigenous children, from 22,3% in Colombia to 58% in Guatemala.

This research draws from both a broad literature review including interviews with local and foreign experts in Guatemala as part of the Western Hemisphere including Brazil and Colombia. The principal author met with representatives from the government of all three different countries in the U.S. but also with the U.S. Agency for International Development (USAID) and Congressman McGovern lead of the program “Feed the Future”. An array of program implementing partners, as well as relevant UN technical staff, also contributed substantial knowledge and insight into this analysis.

The primary concept in the international community is concerning food security as a condition when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences with the main purpose to have a healthy life. Increasing that knowledge have placed a discussion of

food system and how is it compounded? Defines food security implies to aggregate of all food-related activities and the environments including socioeconomic, political and natural components. It's a combination of resources that makes availability and efficient diverse components and resources.

Despite these challenges, Latin America has a strong potential to find creative solutions to tackle the double burden of malnutrition that are not necessarily technologically based.

Food systems are part of a set of activities that include products and consumers; farm to table or farm to farm are some of the common stuff. Try to understand the complex of that interaction with the key role of the different government agents make this as a told to understand how food policies are created and they have been trying to intended and unintended effects.

Discusses the different policies and measure them in term of how they can improve food security at different stages of development. The links between trade and food security and nutrition are complex, there are several channels to approach and also an interaction affecting different dimensions of food security as availability, access, utilization and stability.

Producing more with less; sustainable crop and livestock production can reduce the need for additional agricultural land and the rate of deforestation while increasing productivity. FAO is promoting a number of productive integrated systems – including mixed cropping, conservation agriculture and agroforestry systems – aimed at producing

more food and feed from the same area of land with fewer inputs. The techniques help build resilience to climate change, contributing to mitigation through increased carbon sequestration and boosting ecosystem services such as improved soil fertility and reduced land degradation.

To implement these changes, Latin America must confront special challenges, given its heterogeneity in ethnic identity and socioeconomic status. By way of illustration, prevalence of the double burden of malnutrition is often higher in indigenous populations and poor rural areas. These kinds of disparities require targeted strategies, considering geographic dispersion and accessibility to services, healthy foods and safe drinking water. An obstacle to enacting these strategies includes limited resources: Latin American countries have fewer financial re-sources than high income countries and invest less of their GDP in health. Double-duty programs with a focus on solving all forms of malnutrition should be adopted to avoid causing 'inadvertent' harm. An example is addressing undernutrition without encouraging unhealthy eating or overeating.

Nutrition programs and interventions must consider the nutrient quality of the foods they provide to their beneficiaries. Although foods high in calories lead to weight gain, micronutrient deficiencies can endure among those who are overweight. Moreover, continuous consumption of ultra-processed foods alters a household's or community's food culture, turning them into 'basic' products. An added challenge is designing and implementing nutrition interventions or programs in ways that are sustainable (Gainhealth.org. (2017). Nutrition and food systems).

Agriculture, today, is the world's biggest employer and largest economic sector for many countries. Yet rural people – who produce 80 percent of our food – make up four-fifths of the global poor. Investing in the comprehensive vision of SDG2, End hunger, achieve food security and improved nutrition and promote sustainable agriculture, can catalyze achievement right across the 2030 Agenda. The ambition of SDG2 amounts to ensuring people are able to access sufficient nourishing food, sustaining our natural resources and safeguarding biodiversity, transforming food systems and the rural sector while increasing the productivity and income of smallholder farmers, fishers, foresters and pastoralists.

Colombia and Brazil – Food Security and Ag system.

When we talked about food system, it begins and ends with human health and nutrition. Food system gathers all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the outputs of these activities, including socio-economic and environmental outcomes. This report pays specific attention to nutrition and health outcomes of food systems. It identifies three constituent elements of food systems, as entry and exit points for nutrition: food supply chains; food environments; and consumer behavior.

The food supply chain encompasses all activities that move food from production to consumption, including production, storage, distribution, processing, packaging, retailing and marketing. The decisions made by the many actors at any stage of this chain have implications for other stages. They influence the types of food available and accessible, as well as the way they are produced and consumed.

The concept of food system elaborated has been uniting different disciplinary perspectives as biophysical, social, economic and political. This approach renounces the research. The facts influencing outcomes, as well as the environments is universal however the primary objectives of food systems, freedom from poverty and improved human health and nutrition.

Feed the Future Partnering for Innovation worked with the USAID Bureau for Latin America and the Caribbean (LAC) to promote compliance with food safety standards and ensure continued market access for smallholder farmers. The goal was to align the region's strategic location near the large United States market.

Increased investment in smallholder farmers in rural areas contributed to improved ability to capitalize on export potential among LAC countries. Both Solutions SA and Farmforce made headway toward expanding the sales of technologies, and as a result of their partnerships with the program, are continuing to expand in the region. The LAC Bureau reinvested in the program's two-year extension.

People who do not have sufficient income frequently suffer for food insecurity in multiple dimensions which means they could be malnourished, unhealthy, illiterate, unemployed, depressed and social marginalized. Most of the them are vulnerable to natural disasters, crime or corruption. Poverty is perceived as a multidimensional concept of deprivation, lack of food, education and human dignity. Government policies that favor one group should take care of its own citizens and create more effective public policies. Hunger and poverty go hand in hand, causing a lack of dietary energy and protein (Hunger and

Health. (2017). What Is Food Insecurity in America? | Hunger and Health. [online] Available at: <https://hungerandhealth.feedingamerica.org/understand-food-insecurity/> [Accessed 14 Mar. 2019].

Good governance is part of maintaining economic growth once it has started, providing social and economic stability, ensuring that the benefits are spread through society, and enabling entrepreneurs to create opportunities. Poverty is the key factor in the global food system. Poverty causes hunger, micronutrient deficiencies and most of the time obesity or overweight.

The challenge is to bring about consensus solutions that are meaningful in a timely manner. Participatory governance may make change difficult and time-consuming; one of the challenges to improving participation is that poor people are often perceived as mere recipients or passive targets with economic agents, assets, and goals that policymakers may be unaware.

Food systems should provide year-round access to foods that cover people's nutrient needs and promote healthy dietary practices; food systems need to contribute to preventing and addressing infectious diseases, including zoonotic diseases, and tackling antimicrobial resistance; food systems, including all components of production, processing and distribution should be sustainable, resilient and efficient in providing more diverse foods in an equitable manner, with due attention to assessing environmental and health impacts (IDRC-CRD, 2015).

Colombia

In 2018, economic activity showed signs of recovery, with annual growth rates not seen since 2015. Between January and September, the economy expanded by an annual average of 2.5%, exceeding the 2.0% and 1.8% growth for 2016 and 2017, respectively. It's important to say the economy is projected to grow by 2.7% in 2018 and by 3.3% in 2019 according to the CEPAL. However, in terms of trade, it needs to be stronger in terms of external demand combined with an increase in current transfers from workers' remittances, and more than offset the widening net factor income deficit. Consequently, the current account deficit narrowed from 4.0% of GDP in 2017 to 3.6% by the end of the first half of 2018. That deficit is expected to be in the order of 3.4% of GDP by the end of 2018 (Repositorio.cepal.org, Colombia, 2018).

The trade balance improved in the country thanks to the increase in the dollar value of exports of goods and services, 14,7% in total, in particular from traditional exports. 20% by oil and coal as well as external sales of non-traditional products and 6,3% from manufactured goods. The United States—Colombia Trade Promotion Agreement (TPA) entered into force on May 15, 2012. The TPA is a comprehensive free trade agreement that provides elimination of tariffs and removes barriers to U.S. services, including financial services. It also includes important disciplines relating to customs administration and trade facilitation, technical barriers to trade, government procurement, investment, telecommunications, electronics commerce, intellectual property rights, and labor and environmental protection. The International Trade Commission (ITC) has estimated that when fully implemented the tariff reductions in the TPA will expand exports of U.S. goods alone by more than \$1.1 billion, supporting thousands of additional American jobs. The ITC also projected that when fully implanted

the TPA will increase U.S. GDP by \$2.5 billion (Ustr.gov. (2019). United States- Colombia Trade Promotion Agreement. [online] Available at: <https://ustr.gov/trade-agreements/free-trade-agreements/colombia-tpa> [Accessed 14 Mar. 2019].)

Brazil

In Brazil, growth is expected to steadily build momentum in 2019, from a weak base. The forecast of 2.2 percent for this year assumes that fiscal reforms are implemented expeditiously under the incoming administration, and that a recovery of consumption and investment, resulting from improving confidence and investor sentiment, will outweigh the negative growth effect of reduced government spending. By 2020, a strengthening recovery in Brazil, modestly accelerating growth in Mexico, and solid performance in Chile, Colombia, and Peru, are expected to help push regional growth to 2.4 percent, consistent with potential. Per capita GDP growth in the region is also expected to accelerate moderately, and to outpace per capita growth in advanced economies starting in 2020, after six years of stalled convergence.

The awarding of the 2014 FIFA World Cup and 2016 Summer Olympic Games, the first ever to be held in South America, was seen as symbolic of the country's rise. However, from about 2013 to 2016, Brazil was plagued by a sagging economy, high unemployment, and high inflation, only emerging from recession in 2017. Former President Dilma ROUSSEFF (2011-2016) was removed from office in 2016 by Congress for having committed impeachable acts against Brazil's budgetary laws, and her vice, Michel TEMER, served the remainder of her second term. In October 2018, Jair BOLSONARO won the presidency with 55 percent of the vote and assumed office on 1 January 2019 (CIA, Factbook, 2018).

The economy has been negatively affected by multiple corruption scandals involving private companies and government officials, including the impeachment and conviction of Former President Dilma ROUSSEFF in August 2016. Sanctions against the firms involved — some of the largest in Brazil — have limited their business opportunities, producing a ripple effect on associated businesses and contractors but creating opportunities for foreign companies to step into what had been a closed market.

The succeeding TEMER administration has implemented a series of fiscal and structural reforms to restore credibility to government finances. Congress approved legislation in December 2016 to cap public spending. Government spending growth had pushed public debt to 73.7% of GDP at the end of 2017, up from over 50% in 2012. The government also boosted infrastructure projects, such as oil and natural gas auctions, in part to raise revenues. Other economic reforms, proposed in 2016, aim to reduce barriers to foreign investment, and to improve labor conditions. Policies to strengthen Brazil's workforce and industrial sector, such as local content requirements, have boosted employment, but at the expense of investment.

Brazil is a member of the Common Market of the South (Mercosur), a trade bloc that includes Argentina, Paraguay and Uruguay - Venezuela's membership in the organization was suspended In August 2017. After the Asian and Russian financial crises, Mercosur adopted a protectionist stance to guard against exposure to volatile foreign markets and it currently is negotiating Free Trade Agreements with the European Union and Canada.

In Brazil, the GDP as an official exchange rate is \$,2055 T in 2017 and the key component in agriculture is coffee, soybeans, wheat, rice, corn, sugarcane, cocoa, citrus; beef. The gross national by 2017 is 15% of GDP. The agriculture composition is 6,6% then industry with 20,7% (CIA, 2018). The labor force by occupation is 104,2 million occupied number 5 as a country comparison to the world. Agriculture has 9,4% and industry 32,1%. The unemployment rate is 12,8% in 2017 and the population below poverty line is 4,2% in 2016. However, approximately 4% of the population are below extreme poverty.

Nevertheless, a right-wing populist is part of the new government in Brazil, as we called, the rise of populism that Brazil has been facing, it made Mr. Bolsonaro the president of Brazil with 46% of the vote in the first round amid a crowded field of candidates. Populism is perhaps best and most simply understood as a phenomenon of those movements and parties, that often but always have charismatic leaders which aspire to power and reach it with the idea to retain it. Populist discourse or rhetoric is built, simplistically, around a fundamental antagonism, between the people, loosely defined, and the elite, equally loosely defined.

“As Leslie Bethell mentioned on “Brazil: Essays on History and Politics, 2018, populism is a political practice, a political strategy, a political language but not a political ideology like liberalism or socialism even nationalism. Ideologically, populism has always been vague, confused and eclectic, despite the heroic efforts of post-Marxist intellectual thoughts” (Bethell, L. (2018). Populism in Brazil. In Brazil: Essays on History and Politics (pp. 175-194).

How are Colombia and Brazil addressing the Sustainable Development Global Goals?

The history of the Sustainable Development Global Goals started in 2000 when the world leaders gathered at the United Nation a vision to fight poverty, which was translated at that time into eight Millennium Development Goals (MDGs). These goals made a remarkable job until 2015 with a development framework for the world that created a significant progress.

The successful of the MDGs was unreal, the target of reducing by half the proportions of people living in extreme poverty was achieved in 2010, and then well ahead in 2015 achieving the deadline. According to the United Nation's portal, the proportion of undernourished people in the developing regions has fallen by almost half. One in seven children worldwide are underweight, down from one in four in 1990 (Nations, U. (2018). The State of Food Security and Nutrition in the World. United Nations Sustainable Development).

However, after made this progress, a lot more work started to come up, so then is when the work will now be focus with the Sustainable Development Global Goals which there are now 17 goals, all of them in pro to fight against hunger but also take action with global issues as sustainable cities, education for girls and women, build partnerships, life of land, zero hunger and no poverty, clean water and sanitation, climate change and more.

Brazil is listed as a lead country in the Sustainable Development Global Goals. For 2019, Brazil has signed as a voluntary nation to work in commitment with the high-level political forum that will be "Empowering people and ensuring inclusiveness and equality". The set of goals that Brazil as a nation will be reviewing and following are Goal #4. Ensure inclusive and equitable quality education and promote lifelong learning

opportunities for all. Goal #8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. Goal #10. Reduce inequality within and among countries. Goal #13. Take urgent action to combat climate change and its impacts. Goal #16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels. Goal #17. Strengthen the means of implementation and revitalize the global partnership for sustainable development (Sustainabledevelopment.un.org, 2019)

One of the social programs is Bolsa Floresta which is helping traditional communities for their commitment to stop deforestation by distributing payments for ecosystem services to families, communities, and family associations. The dynamic of the program is families must attend a two-day training programs on environmental awareness and make a zero deforestation commitment. In addition, they must enroll their children in school. They then receive a monthly payment of 50 reais (US\$30). Community associations can also receive payments of up to 4000 reais (US\$2500) to support legal income generation activities that do not produce smoke, such as bee keeping for honey production, fish-farming or forest management. However, the progress of the program has not showed any progress since February 2013 which means the status is unknown and the implementation and methodologies are not following the standers.

In 2015, Colombia created the Inter-institutional Commission for the Preparation and Effective Implementation of the Post-2015 Development Agenda and its Sustainable Development Goals (SDGs) under the administration of ex former president Juan Manuel Santos. Several organizations as part of government including ministries of the nation work in this committee, among which the Ministry of Foreign Affairs, the Ministry of

Finance and the National Planning Department (DNP, the acronym in Spanish) stand out. The objective of the committee is to monitor, evaluate, prepare and implement the strategies and projects designed to meet the 17 global goals with the idea to protect the planet, solve world problems and guarantee resources for the welfare of new generations (LatinAmerican Post, 2018)¹²

In terms of advances to meet the agenda, the National Planning Department (DNP) has made a tremendous progress of the achievement to Goal #6 regarding clean water and sanitation. Based on that, the government achieved that 6.9 million people had access to drinking water for the first time. At the same time in partner with World Wildlife Foundation (WWF), interinstitutional articulation is important in order to make environmental actions more effective and working in parallel to achieve the 2030 Agenda for Sustainable Development. It is important to say, there are still key challenges in the region that the government needs to take care of them and double its effort to continue complying and meeting the SDGs.

In 2018, Colombia was part of the 2018 voluntary national review of the high-level political forum on sustainable development. Nevertheless, as part of the former president Juan Manuel Santos, Colombia signed a document to work towards sustainable peace, poverty eradication, and shared prosperity. The country has three development objectives - sustainable peace, poverty eradication, and shared prosperity - seem within realistic reach for the first time in Colombia history (World Bank Group, 2018).

¹² Colombia: How is the implementation of the sustainable development goals going? LatinAmerican Post, Empowering People, 2018. <https://latinamericanpost.com/22177-colombia-how-is-the-implementation-of-the-sustainable-development-goals-going>

The three development objectives and the proposed policies to achieve them in nine areas are discussed at length. The nine areas targeted are: 1) rural development; 2) urban development; 3) disaster risk management; 4) environmental sustainability; 5) infrastructure; 6) financial markets; 7) innovation; 8) social protection; and 9) subnational governments. In the past decade the Government has made strenuous efforts to reduce violence and increase state presence, and the country is no longer considered high risk for investment. The note uses international evidence to identify three main transitions Colombia society must undergo to build sustainable peace, including security transition, development transition, and political transition. It also analyzes on a granular level Colombia's poverty and inequality trends over the past decade, most notable of which is the decline of the multidimensional poverty rate.

Chapter III – The Role of the mother feeding their kids - The role of mothers in child nutrition

Hello Mom, you are pregnant! Congratulations! So now, you should be careful with what you eat, and the new habits that you need to implement, not only for you but for your baby. The news of being pregnant comes full of joy, satisfaction, and love; but at the same time a great responsibility to yourself and the new life that grows in your womb. One of the most important things, crucial to life, is the proper and healthy development of the baby.

This chapter is focus on the role of the mother feeding their kids in the first 1,000 thousands days; which means between 0 and 3 years old. After that, children have a better

development and learning on the school, including girls and boys, in ages 6 to 12. This period of development is when children start primary school. The idea to re-think the lunch-box that kids are taking to the school as part of school feeding program. “The idea for successful childhood development is to re-think the lunch-box that kids are taking to the school as part of school feeding and recognizing strategic flaws that are directly related to development challenges; both in cognitive and physical developments.”

In order to analyze the challenge of malnutrition, undernutrition and obesity in Latin America are main focus points. It's key to galvanize the problem to ensure that every child has a healthy start to life even since the mom is pregnant. The problem of poor nutrition is pervasive through the five continents, although this is just one consequence of poverty, instability, violence, and so many more. Malnutrition affects thousands of children not only around the world, in developing countries as Latin America, young children suffer from high rates of obesity, food insecurity, unhealthy diets, lack of education in mom regarding breastfeeding, and lack of access to better food.

Breastfeeding is one of the most important household actions that influence children's nutritional outcomes and that can be modified through policies and programs. Exclusive breastfeeding for at least the first six months of life provides a baby with an adequate source of nutrients and antibodies and eliminates the risks of illnesses associated with the use of infected utensils to feed formula. Moreover, in a country where contraceptive use is as low as in Guatemala, breastfeeding plays a major role in repressing fertility by extending the duration of post-partum amenorrhea.

Pregnancy is also a time when excessive weight can be gained leading the mother susceptible to an increased risk of long term overweight or obesity and entering subsequent pregnancies with a higher BMI. Breastfeeding has been shown to create a caloric deficit to promote weight loss, yet no study has assessed breastfeeding exclusivity at 3 months and maternal body composition at 6 months as well as breastfeeding exclusivity at 6 months and maternal body composition at 6 months (Michelle Curtis, 2015) .

The fears during the stage of my pregnancy were too many the first thing I think is the health of the baby, who have good birth weight, there are no intrauterine diseases, as a mother does not develop gestational diabetes, that the baby who cannot stand, and gain weight in a healthy way during the process and this is compounded by the fear of not losing weight after delivery or all the doubts that come when you see that your body begins to change drastically.

Undernutrition and excess nutrition may coexist in the same household, or in the same individual; which is known as the DBM. Recent data from Latin America and The Caribbean countries showed that the percentage of households with a stunted child and an over-weight or obese mother ranged from 20% in Guatemala, 13.1% in Ecuador, and 8.4% in Mexico to 6.3% in Uruguay, 5.1% in Colombia, and 2.7% in Brazil. Moreover, at the individual level, the prevalence of overweight/obesity and iron or zinc deficiency in preschool- or school-aged children ranged from 1.2% in Brazil to 8.4% in Ecuador, and in women of reproductive age, it ranged from 3.4% in Colombia to 13.6% in Brazil.

In Guatemala case study, the potential of the 1,000 days came into a successful result could be difficult for the conditions but also as Roger Thurow mentioned on the book “The First 1,000 Days” it came to a boil of bounding of potato soup. Thousands of moms would rather to see their kids in the school, playing and having a great develop on class because they will be the future of the generation. However, they can learn today, go in one ear and go out in the other. This is a result of the nutrients on the food is not enough so, the kids cannot be able to learn enough, capture and retain the information most of the time could be hard during their educational learn. Another issue that affected nutrition and food is water sanitation which its crucial and if the community does not have good water service and hygiene, kids and moms could get diseases and weak immune system.

What moms are eating in Guatemala? How are they feeding their kids? Guatemala has been suffered lack of resources including infrastructure and transportation due to the bad governance and corruption. It reflects in the community, in specially moms who had walked long distances between the hospital or social center from their homes. But also, some of them have to carry their babies on their backs. Moms in Guatemala are short, it means the composition is not strong enough and they also have stunting problems including malnutrition.

In Guatemala’s Valley, most of the children are suffering stomatal problems due to the parasites and worms that consumed the small quantity of nutrients meant from that their bodies. Poor eating habits, poor water, and poor sanitation made the valley region one of the unhealthiest places in the country. (Thurow, Roger (2016).

What is Guatemala producing? Crops in Guatemala?

“Looking downs from the hilltops you saw breaks in the vast corn quilt where farmers had sown patches of beans, broccoli, brussels sprouts, cabbage, cauliflower, carrots, onions, peppers and a vast array of other vegetables. Roadside stands and city markets displayed radishes bigger than tennis balls, cucumbers the size of toy blimps, and carrots so cartoonish large they would have Bugs Bunny drooling. Surely, you would think, the people living in this super-sized cornucopia must be among the healthies in the world but unfortunately the true is the opposite” Roger Thurow highlighted on the book “The First 1,000 day, a crucial time for mothers and children in the world”.

As part of the list, it is important to remember the quantity of energy that provides potatoes as a complex carbohydrate. The right portion varies of the weigh and age however when boiled a single medium sized potato contains about half the daily adult requirement of vitamin C and a significant amount of vitamin B, iron, potassium and zinc. But in the other side, sweet potato, just 125 grams of this root contains enough beta-carotene to provide the daily vitamin A needs of a preschool-aged child. It means kids will get a valuable source of vitamin B, C and E. Milk or dairy provide protein and calcium, as well other products that are part of the food basket including vegetables as onion, garlic and broccoli. The mix of these ingredients depends on what would be the benefits that you take from the food. Corn is another valuable crop but there are many different ways to prepare it, it does not mean tortilla which is a flat crepe made with corn flour, water and salt. Corn is able to be mix with any other crop or vegetable and create extraordinary recipe with a valuable nutrition facts and vitamins for kid’s development.

Corn is the most valuable crop in the western-hemisphere country, the ancient Maya had cultivated and honored it, people believed they were descended from cornstalks. And corn remained the dietary deity today, there is no meal, must be complete with corn in different presentation, tortillas or tamales. Corn is part of the three-quarters of the local diet. Farmers in Guatemala spent money and time tried to understand the way to produce corn in a better way but also how to export it. Besides of that, the country huge wealth gap, is one of the widest in the world. Rural poverty and neglect helped spark a civil war that raged for more than thirty years, just ending in the mid-1990s, and remain an enduring legacy (Thurow, Roger (2016). The war affected dramatically the highlands, and the indigenous communities were the most affected.

“It’s terrific when you analysis, nearly two decades later, poverty and still beating the country in the highlands. More than half of Guatemala’s population struggled below the poverty line and more than one-quarter of the rural population lacked access to clean sanitation facilities. The community had been marginalized in the national economy but they had been excluded of communications, education and health services that the government were provided” Roger Thurow mentioned on his book “The First 1,000 day, a crucial time for mothers and children in the world.

When the Niño phenomenon hit Latin America region, Guatemala was one of the most affected by erratic rains, unusual high temperatures that affected crop production, landslides, earthquakes, and droughts but also when the Tropical Storm Agatha and the Pacaya volcanic eruption caused damages and losses of around US\$1.5 billion in the country, affecting 911,000 people; nearly 4 percent of the population (UNICEF, (2011).

All of these natural disaster had negatively affected crop production in the country heightening the population's food insecurity and leading to high levels of malnutrition.

For UNICEF, Chronic malnutrition is a serious ongoing concern for children in Guatemala. It affects 49 per cent of the population under age 5.4 The gaps between urban and rural areas are considerable; while in rural areas the chronic malnutrition level is 52 per cent, in urban areas it is 29 per cent. Only 50 per cent of children 0–5 months old are exclusively breastfed. Chronic malnutrition is aggravated in times of floods, drought and other natural disasters, as crops are lost and family income decreases. Nevertheless, the access to basic social services such as health, safe water and sanitation is constantly disrupted in school which means Guatemala continues to be one of the countries in the region with a high mortality rate during any drought season. Besides of that, the situation in the country is alarming, children is the population that more suffered. According to UNICED, in 2009, 533 violent deaths were reported, as well as four children killed monthly by stray bullets. These figured an estimated 8,000 cases of sexual abuse committed against children each year.

Nutrition policies should promote a diversified, balanced and healthy diet at all stages of life. In particular, special attention should be given to the first 1,000 days, from the start of pregnancy to two years of age, pregnant and lactating women, women of reproductive age, and adolescent girls, by promoting and supporting adequate care and feeding practices, including exclusive breast feeding during the first six months, and continued breastfeeding until two years of age and beyond with appropriate complementary feeding. Healthy diets should be fostered in preschools, schools, public institutions, at the workplace and at home, as well as healthy eating by families.

It's important to recognize food and agriculture systems, including crops, livestock, forestry, fisheries and aquaculture, need to be addressed comprehensively through coordinated public policies, taking into account the resources, investment, environment, people, institutions and processes with which food is produced, processed, stored, distributed, prepared and consumed. Family farmers and small holders, notably women farmers, play an important role in reducing malnutrition and should be supported by integrated and multisectoral public policies, as appropriate, that raise their productive capacity and incomes and strengthen their resilience.

School Meal Program

Latin America and the Caribbean countries have made significant progress in tackling hunger and malnutrition, reducing the number of hungry people by 16 million over a decade, but much work still remains to be done. Despite significant gains in reducing hunger, almost seven million preschool children in Latin America and the Caribbean remain chronically undernourished.

According to The 2030 Agenda for Sustainable Development is important to recognized the way that governments are leading and provided equal opportunities for all. Innovative partnerships are indispensable to meet the global goals, and the call should be for everyone who has the responsibility to take action. For that reason, the World Food Program in the Latin American Region through School Meals has been supporting governments and partners with the idea to create new forces and achieve the problems the region is having. It is a concern the high rates of obesity and overweight are threatening health. School meals not only help to feed children but also promote better healthy eating

habits which represent a unique instrument and promote human development, and achieve education goals.

In 2017, The World Food Program and Latin American Network School Meals launched a study identifies six areas where expose opportunities to improve school feeding in the region. As part of it, attention to the nutritional aspects, political and financial commitment, monitoring and evaluation systems, integration of school feeding programs with social protection strategies, community participation and innovation from the multi-sectoral partnership made this report a great resource. Focus in Latin America and the Caribbean, the region has achieved impressive socio-economic development. More than 30 million people have overcome hunger in less than twenty years, and significant results have been achieved in terms of nutrition. In 1990, about 13.9 million children under five years of age suffered from stunting, decreasing to 6.1 million in 2015. Nevertheless, chronic malnutrition still affects 11.6 percent of children under five. On the other side of the malnutrition spectrum, childhood overweight and obesity are on the rise. In most Latin America and Caribbean countries, undernutrition and micronutrient deficiencies coexist with rising levels of obesity, largely affecting school-age children and adolescents (WFP and Latin American Network School Meals (2017).

As a possible recommendation to keep working on this program and end hunger could integrate a smart investment on quality school meals that maximize their contribution to nutrition. Strong focus on micronutrient deficiencies, overweight and obesity are also part of the promotion for healthy habits, focusing on special approaches for adolescent girls and pre-primary schoolchildren. The continued political and financial commitment to provide a better service is also a well-know objective. Strengthened, monitoring and

evaluated the system to support the expansion of school meals should mark up as part of renewed forms of community participation to enhance local ownership and gender equality thinking on different contexts, and community practices.



Photo Foot by The World Food Program and Latin American Network School Meals Study.

School feeding programs are often used for social protection purposes as much as or more than for education goals. On the other hand, school meals program play a significant role to against hunger and malnutrition, for that reason the main component should focus on main framework, nutrition-specific and nutrition-sensitive interventions. Nutrition-sensitive interventions or programs address the underlying determinants of fetal and child nutrition – food security, adequate caregiving resources at the maternal, household and community levels, and access to health services and a safe environment – and

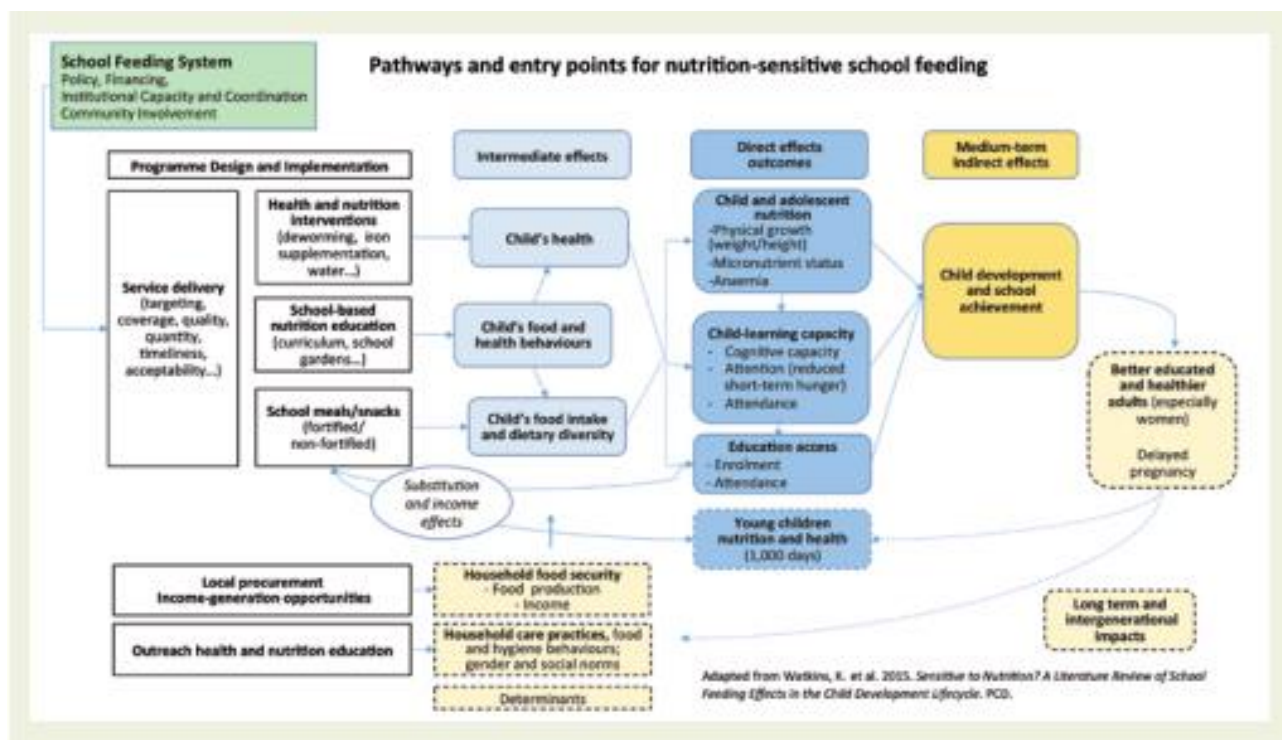
incorporate specific nutrition goals and actions, thus accelerating progress of nutrition specific interventions (Ruel and Aderman (2013).

The programs provide an explicit or implicit transfer to households of the value of the food distributed, with the value of the transfer varying significantly from in-school snacks at the lower end and large take-home rations at the upper end of the spectrum. Here we consider some of the key issues in assessing the benefits of school feeding programs versus other forms of social safety nets. The value of school feeding to the household as a percentage of household base income is rarely reported, but a back-of-the-envelope calculation can give us an approximate range that may be plausible. A family wishes their children to eat three meals a day, or 1,095 meals a year. The school year may be 180 days, and the program will serve one meal per school day. Thus, a child may receive about 16 percent of his or her meals at school (WFP and Latin American Network School Meals (2017).

School Feeding Meals Policy in Latin America Region

The figure below shows the different, interrelated pathways through which the provision of school meals may affect schoolchildren's food consumption, nutrition and health, and impact on child development. It also describes the lifetime and intergenerational pathways through which school meals may impact child nutrition at the household and community levels. Food intake, in terms of quantity, quality and diversity, plays a major role in determining nutritional status and provides the most direct link between school meals and nutrition. Many school meals programs supplement the food provided at home and improve schoolchildren food consumption and dietary diversity by improving

children's access to healthy foods and by providing macro and micronutrients often missing from the diets of children in middle- and low income countries (Alderman, 2016).



Colombia, Nutrition and School Feeding Program.

Colombia is a developing country found upon the northwest apex of South America (United States Central Intelligence Agency [CIA], 2014). Currently, Colombia serves as a valid model to monitor food security secondary to the distinctive conditions inherent to human translocation due to an ongoing civil war, or internal conflict (Internal Displacement Monitoring Centre [IDMC], 2013). Despite a robust economy and a favorable finance classification by the World Bank (2013), volatile public safety concerns are often further exacerbated by the pestilence of narcoterrorism and pervasive violence

(Holmes, Gutiérrez de Piñeres, & Curtin, 2008), which still distresses the nation. These contradictory affirmations still ensures that Colombia can remain an ideal locus for both international commerce and foreign investments with limited risk (World Bank, 2013), with contemporary metrics suggesting the strongest within Latin America (Proexport, 2013).

During the first months of life, the baby become a reality, breastfeeding plays a key role because is when the baby starts to take all the benefits from the milk that mom has on her breast. The milk should be rich in nutrients and the moms should take care of the food that she is eating more than ever.

“As a mom, breastfeed could be a hard stage for any mom, I never felt that my daughter had enough milk and it made me worried because I wanted to give the best quality food to my kid. After I noticed, my levels of milk were not enough, I started to give her milk power due to the unexpected milk decrees after the third month that I gave birth”. Expressed Kelly Otalora, she is from Colombia, living in Medellin. One of the main cities which contributed 13.9% of the country’s gross domestic product in 2017. Most of the population live in low, low-middle and middle income class, with a rate of 13,4% of poverty in Medellin (DANE, 2017) .

In Colombia, the role of the mother has changed in the last 20 years. This change has partly been derived by the food system, recently, moms are asking what could be the best food to feed their kids? If we have healthy and well-educated moms, we can have a better chance to have healthy kids. However, the idea looks simple but the challenge here is

education during all different stages starting of the pregnancy. It's also important to tell moms the importance of the 1,000 days on their kids as a crucial time.

Based on an conversation, you will find along to this chapter interviews with moms from different ages, cultures, and ideology. It's important to clarify that the moms who participated on this research project are living in the same countries that the thesis is focus, it meant Guatemala, Colombia and Brazil. But also, the paper included testimonies of a kid in Brazil who mentioned how her mom feed her and what are the disadvantages and advantages that children have in Brazil.

The key question was, what was the hardest thing during their pregnancy? The conclusion was the first trimester is crucial, indeed it could be the most anxious and lonely moms for any mom. Why? Since, you are in the bathroom trying to figure out what is happening on your body, sitting in the toilet waiting for the double line shows up and get the confirmation. These minutes matters and they could be the most exciting or scared time in life. However, after the confirmation, the next question is: what do you need to do? How you should take care of myself and also of this second person who is growing inside of me. Struggled and Fear, two words that most of the moms used to described this period of time.

Hormonal imbalances, nauseas, anxiety, and then the biggest question, what should I eat and what not? Do I need multivitamins such as Iron? The great news of being pregnant comes full of joy, satisfaction, love but at the same time a great responsibility to yourself and the new that grows in your womb, and one of the most important things that life has in mind which is the key to the proper and healthy development of the baby.

The fears during the stage of my pregnancy were too many the first thing I think is the health of the baby, who have good birth weight, there are no intrauterine diseases, as a mother does not develop gestational diabetes, that the baby who cannot stand, and gain weight in a healthy way during the process and this is compounded by the fear of not losing weight after delivery or all the doubts that come when you see that your body begins to change drastically.

Colombia is one of the countries with one of the best agriculture sources. Lunch is considered the biggest and most important meal of the day. Whether children finish classes before the lunch hour and head home to eat or stay in school a full day and dine there, the menu is relatively the same. It typically consists of a soup, rice and beans, protein, a vegetable, fried plantains, and fresh fruit juice. Sometimes grilled or fried arepas, (delectable corn cakes either stuffed with cheese or served solo) may also accompany the meal . Although, the school meals program is part of the Minister of Education and Health in this country.

The main objectives that they have to work are Promote access for children and youths to the formal education system as a part of the strategies of the Ministry of National Education. Contribute to the permanence of children and youths in the formal education system, reducing absenteeism and dropout rates. Provide a food supplement to the children and adolescents of school age, registered with the official registration, to provide energy requirements, macronutrients (carbohydrates, proteins and fats) and micronutrients (iron and calcium), and in the percentages defined for each category during the school day. Encourage healthy eating habits in children and youths in

accordance with the provisions of the Law 1355 of 2009. Promote healthy lifestyles in accordance with the purposes stated in the General Education Act 115 of 1994. Encourage citizen participation for social control in the program's development framework.

Brazil

During the interview process with mothers from Brazil, I found natives moms living in the U.S. who had moved in the last 5 years. Most of them agreed, the food system in Brazil has the most highest standard of quality but also food is accessible, nutritious and affordable. One of them, Gabriela who has been in the United States the last five years. She remembered the quality of food that her parents gave to her when she was a kid. She mentioned her dad is a farmer, so she knows what is the reality of the agriculture system in the country. The access of food is in Gabriela's terms pretty good compared to other countries.

"Brazil is a country with massive extension of land; livestock is everything for Brazilian people who are proud of the rich of natural resources and economy levels of the country. Although, everything is not always perfect. There are malnourish people and obese too; the lack of opportunities make things difficult for people in my country. However, I think Brazilian people can get accessible and nutritious food. Brazilian diet is based on rice, cassava, black bean, okra, acai, meat (chicken, beef, and seafood) but also dairy products as eggs, milk, a rich varieties of vegetables and fruits as well. Children are usually getting enough nutritious although, Brazil has a huge variety of desserts very rich in calories. In general, I always had good food at home and people around me do not suffer for food. Of course there is poverty in the country but it depends of the area. Now, that I am away from home, I miss Brazilian food and the way that people eat here is completely different. I have

friend who become moms, they are trying to give to their kids good nutrients, and quality food making sure the quantity of calories are good for children's development".

On the other hand, I found two mothers at the grocery store in D.C.; they moved recently to the United States and each of them has two and three kids. Following it, they have told me, back home we can find good food however the economy in Brazil is not the best now. So, people cannot afford food as part of the food basket. They sometimes have to buy sugary items or soda because it's cheaper there. Although, people eat meat at least two or three times a week. Brazil has huge extension of land and the country should do more in terms of agriculture. One of them, Claudia, highlighted the investment the country is doing in biotechnology.

"Finally, Claudia and Flavia mentioned the way that they are feeding their kids. Good portions of fresh fruits and vegetables, we do not like to give many candies however they can get a treat one a week. Soups, grains, yogurt, cheese, okra, kale, carrots, rice, cassava, and strawberries are part of kid's diets".

Brazil has been recognized for many years as a monoculture exporter, a famous country exporting tropical agricultural commodities. Coffee and sugar one of the largest production in the south and on the Atlantic coast of the country as well. Nowadays, Brazil is one of the world's largest grain-producing countries. Besides of that, in 2011 exported the largest volume of soybeans which it was one of the fields that Dr. Norman Borlaug worked in connection with the Green Revolution and after that Mr. Borlaug received the Nobel Peace Prize. Crops in Brazil contribute substantially to global food security. Other

crops part of the selective groups such as maize, feijoada, bean, sorghum, wheat, cotton, coffee, vegetables and other high-value fruits.

Brazil case, for example, it requires schools to purchase 30% of food locally; a trend that both benefits rural economies and potentially enhances the nutritional quality of the food. This broader multisectoral scope of program objectives can be challenging as it tends to lead to more complex program design and implementation, but it can also increase impact by providing multiple benefits over several sectors. In high-income countries, the multisectoral approach is the norm. Setting objectives for the programs is the essential first decision in effective design. But there remain other important decisions, especially regarding targeting approaches and the supply chain model, that critically determine program effectiveness. Table 1 shows that there is considerable variation in the approach to targeting, with half the countries providing food to all children and the other half targeting the program to the most neediest communities, based on geographically defined metrics of need. Individual targeting is rare and complex, but is nevertheless, successfully used by some countries.

Micronutrients

Although Guatemala is a pioneer in Central America in terms of adopting micronutrient fortification programs, very few of its programs are successful, mostly because of interruptions in the service, weak regulation, and poor targeting. Up-to-date information is not available on the outcomes of such programs, and an in-depth and rigorous nationally representative evaluation of the impact of such programs should be a priority for the government.

The Guatemalan people receive very little supplementation of iodine through salt and of folic acid through wheat flour. The percentage of women affected by anemia (35 percent in 1995) is the second highest in the Central American region. Malnutrition among women is of particular concern because of the potential consequences for babies' birth weight and infant mortality.

Only 16 percent of Guatemalan infants surveyed in 1999 met the daily caloric requirement, and only about one-third received an adequate intake of protein. Only 2 percent of the children in the sample had diets that provided the recommended intake of iron. However, it is inaccurate to say they achieve the intake of these vitamins.

As part of the agriculture policies, there is a support the production of a diversity of nutrient-rich foods and to be congruent with national nutrition priorities and goals including food-based dietary guidelines.

Brazil and livestock nutrition-sensitive; the livestock sector encompasses a large range of livelihoods, including meat, eggs, fish and dairy products such as milk, yoghurt and cheese. But also its value the livestock ownership that can contribute to dietary diversity and nutritional outcomes through home consumption and income generation, especially if there I a nutrition education and complementary feeding.

Bolsa Familia is the largest conditional cash transfer program in the world, having reached one-fourth of the Brazilian population. It gives poor Brazilians direct cash transfers, provided that their children attend school and are vaccinated. The program boosted children's growth, increased school participation among girls, and upped the odds of children visiting health posts for preventive care, among other benefits.

Chapter 4:

Obesity, the challenge for Latin American Countries

Obesity is an exploding health issue in Europe as well as the United States. However, it is not limited to the developing world: Mayans in Guatemala, Colombia and Brazil have also showed patterns of emerging obesity. The World Health Organization (WHO) is deeply concerned about the issue, recognizing that nearly 1 billion adults are overweight and at least 300 million are obese.

The obesity problem demands serious action from governments because it is levying heavy costs on societies everywhere. WHO has clearly raised the bar with its endorsement of a global campaign against obesity (Abelson, P., & Kennedy, D. (2004). The obesity epidemic). At the political level, the best solution surely is a ministry or department that is responsible for dietary advice, research, and improve the food policy and is dominated by the interests of consumers rather than producers.

The Panorama of Food and Nutrition Security in Latin America and the Caribbean, noted that the region 5.5 percent of the population lives undernourished, thus around 4 million children - just over 7 percent - of children under the age of 5 are overweight in the LAC region.

In the last decade there has been a proliferation of national policy initiatives in Latin American countries focused on physical activity and obesity. Brazil has led the way in taking well evaluated examples of community-based physical activity promotion and turning them into national policy and funded programs (Malta and Barbosa da Silva, 2012). In Colombia the movement to reclaim public space and purpose it for physical activity promotion, best exemplified by the Ciclovía program in Bogotá, has become part of national health and recreation policy (Sarmiento et al., 2010). This policy shift was undergirded by legislation that created a comprehensive national obesity prevention law in 2009 (Anon, n.d.)

Nevertheless, as there is much focus on nutrition in Colombia, a predominant amount of the resources have a focus on emphasis on undernutrition. With overnutrition becoming an ever more increasing issue, there is a need to address the dual burden of malnutrition in Colombia to better allocate resources for preventive health programs and policies.

One of the most important governmental efforts to combat obesity and to prevent overweight health in Colombia is law 1355; which passed in 2009 (Docs.colombia.justia.com. (2009). LEY 1355 DE 2009). The multifaceted program in place focused on prevention, treatment, and the control of obesity.

Unfortunately, the law is not fully implemented, but it has an aim to study the dual burden of malnutrition in Colombia at the individual and household levels among children ,5, school-aged children, adolescents, and adults.

This law had five main strategic parts to it, those five parts were as follows: “The law also describes strategies to promote healthy eating, such as 1) ensuring fruit and vegetable

availability in schools; 2) implementation of food education programs in schools; 3) regulation of highly caloric food and beverage intake in schools; 4) encouraging consumption, production, and marketing of fruit and vegetables; and 5) regulation of fat content of food, mainly trans and saturated fats.” (O. L., Parra, D. C., González, S. A., González-Casanova, I., Forero, A. Y., & Garcia, J. (2014). The dual burden of malnutrition in Colombia).

A cross sectional study analyzed health demographics in 2010; which included 171,183 individuals of varying backgrounds and ages were studied for the dual burden of malnutrition; which is described as “the coexistence of overweight and stunting or anemia in the same person or household.” Results from this retrospective analysis found a high prevalence of overweight and obesity that coexist with anemia and stunting. It was found that at least 5% of household had at least one student child under the age of 5 years old.

As with various government policies in place and statistical analysis of the dual burden of malnutrition in Colombia, these observed estimated are lower than expected; however, the fact that this dual burden of malnutrition coexists in Colombia bring light to more issues and a need for government policies and intervention to focus on the many factors of malnutrition. Many of the policies and programs already implemented in Colombia use a framework called the National Policy of Food and Nutrition Security (NPFNS) which it was implemented in 2008. This framework focuses on economic means, quality of life and well-being, and the intersectoral action for food quality and safety. This has worked well for many programs, but perhaps to prevent the dual burden of malnutrition, selective nutrition programs should base their focus on anthropometric measures and

nutritional status, as measured by micronutrients. The National Policy of Food and Nutrition Security (NPFNS) has coordinated to reinforce their policies and efforts to control undernutrition in the country 2012–2019 as a framework.

Consequently, in Guatemala by the 1950s, governments and agencies joined forces from around the world to establish nutrition research centers in Guatemala cities. The field of nutrition was emerging as a “transnational sphere of social activity to be measured, managed, developed, restructured, and compared.” In Guatemala, fatness was commonly viewed as evidence of health and prestige (Yates-Doerr, E. (2015). *The weight of obesity: Hunger and global health in postwar Guatemala* (Vol. 57). University of California Press). Obesity in Guatemala is much like obesity everywhere in which it is an epidemic that can become mobilized. It’s crucial to encourage the government to improve the food policy in terms of nutrition. Food policy means in the setting of goals for the food system or its part, including natural resources, production, processing, marketing, food consumption and safety by setting regulation and incentives for different stakeholders. But also as part of the food policy term itself, it should include government programs that include consumer, farmers, subsidies, biofortification, food safety, trades, and strait objectives that improve the economic growth, poverty reduction and environmental protection.

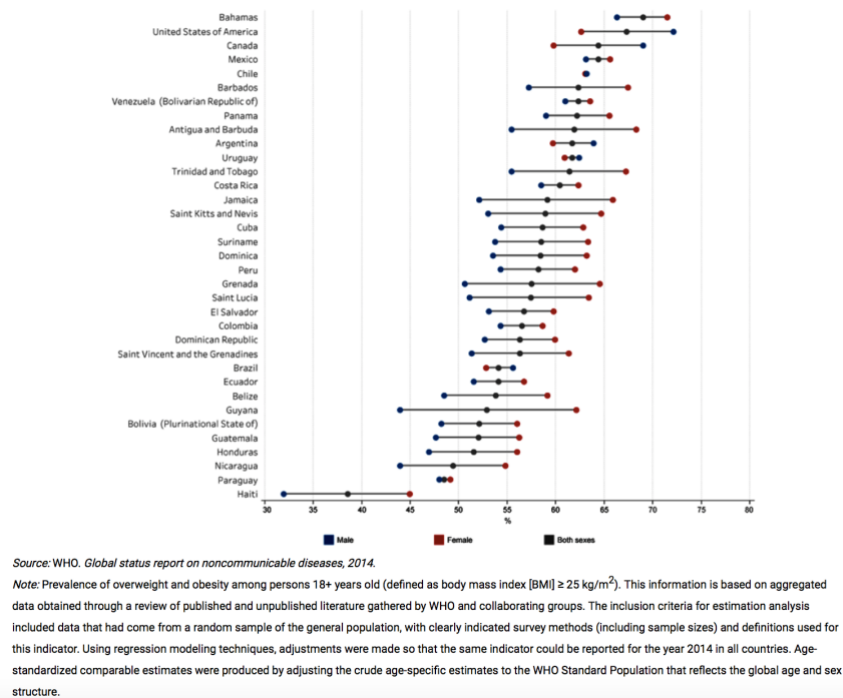
Food policies should negotiated between government agencies but not only finance and agriculture ministries, it is also part of this group the ministers of health, commerce, education, and environment (Pinstrup-Anderson, Per and Watson, Derrill, *Food Policy for Developing Countries*, 2011, Cornell University).

The witnesses between food policy and developing country governments are the measures to reduce hunger and identifies a substantial number of reasons to proceed for these commitments and improve nutrition. The current situation in countries like Guatemala, Colombia and Brazil is families and government do not recognize the human and economic cost of malnutrition, underestimate the benefits of nutrition programs, or they overestimate the cost of nutrition programs, but also the governments many not know other interventions can combat malnutrition more rapidly than economic growth and poverty reduction. As part of the problem, some politicians and civil servants are not interested in whether nutrition programs are implemented well because they do not perceived as something that is happening so, it might not require an immediate attention. In the other side, the lack of commitment to nutrition which leads to weak impact, and limited financial resources due to the bureaucratic capacity.

In terms of economic agriculture production, it is crucial to understand that agriculture is a dynamic, integral competent of most economies in the world, and it provides employment and income to more than half of the population. The areas of the world with the lowest agriculture labor productivity also have the largest number of poor people (ILO, 2005). With agriculture growth promotes greater gender equality and women's empowerment, when they work in the planting, collecting water, weeding, harvesting, transporting or marketing food. All of these factors improve people's live change due to the empowering women and improving their access of the land.

Recall chapter 2 and 3; poverty, hunger, and nutrition are part of the main problem in Latin America region, obesity. The prevalence of overweight and obesity in children has become a major problem in the Americas. The main reasons for this are changes in

lifestyle and the lack of policies promoting healthy diet and physical activity. As a result, obesity among children and adolescents has reached epidemic proportions in the Americas (PAHO, 2014).



Among of these, it's important for us to recognize that Colombia, in 2007, the Ciclovía program was incorporated into the Colombian National Public Health Plan as a strategy for promoting physical activity and reducing chronic diseases, and in 2009 it became part of the national obesity law (Anon, n.d.). The Ciclovía of Bogotá serves as a model for 66 other programs in Colombia that form the Colombian Network of Ciclovías, supported by the national sports and recreation directorate (COLDEPORTES). However, in Brazil over the last three decades, a number of cities have implemented free physical activity classes, often after rehabilitating small parks and plazas in poor neighborhoods (Simoes et al., 2009; Heath et al., 2012).

In conclusion to prevent obesity primarily in children, we need to advocate and create prevention in the community during childhood and adolescent, so it might help to reduce the earlier onset of Type 2 diabetes, cardiovascular disease and obesity related depression in children and adolescent. But also, we need to include gradually workshops with families and held them to change eating habits adopting activity levels. Parents should be the model, if they eat healthy food and do any activity to improve their physical levels, their children will do the same. In Latin America countries is also important to encourage children to drink water or non-sugar beverages due to the high levels of sugar. It crucial to teach mother how to read nutrition labels; and make sure why fruits and vegetables or plant based diets could make a significant change on people's diets.

According to Stanford Health Care, people can calculate the Body Mass Index (BMI) which is a measure of weight proportionate to height. Generally, the BMI is considered an effective way to evaluate whether a person is overweight or obese. According to the National Heart, Lung, and Blood Institute (NHLBI), a BMI from 18.5 to 24.9 is considered normal while a BMI of more than 25 is considered overweight. A person is considered obese if the BMI is above 30, and severely obese if the BMI is above 40 (StanfordHealthCare.org, 2019).

Prevent obesity in infants is crucial, the longer babies are breastfed, the less likely they are to become overweight as they grow older. So, breastfed is an important step in babies. In Latin America, breastfed is vital, it is more than feed the babies. It's the addition of nutrients but also the relation between the baby and the mother. Breastfeeding triggers hormones in the mother and child that stimulates and contribute to the formation of a

close bond between the mother and the baby. The human milk can offer the child the ideal and complete food during the first 6 months of life, but it will be the optimal source of dairy during the first two years or 1,000 days when the child needs to get the best supplements to accomplish the physio motor development. From the nutritional point of view, childhood is a very vulnerable period, since it is the only period in which a single food is the only source of nutrition, and precisely during a stage of maturation and development of their organs (Picciano, 2001). Each milk has its own characteristics, it depends the quality of food that the mother is getting and how accessible, affordable and nutritious is the food. Breastfed has a distinguished steps are recognize as preterm milk, colostrum, transition milk and mature milk.

The colostrum itself occurs during the first 3 to 4 days after delivery. It is a yellowish and thick liquid of high density and little volume. In the first 3 days postpartum the volume produced is 2 to 20 ml per feeding, this being enough to satisfy the needs of the newborn. The transfer of milk less than 100 ml on the first day, increases significantly between 36 and 48 hours postpartum, and then levels at volumes of 500-750 ml / 24 hours at 5 days postpartum.

Colostrum has 2 g / 100 ml of fat, 4 g / 100 ml of lactose and 2 g / 100 ml of protein. It produces 67 Kcal / 100 ml. It contains less amounts of lactose, fat and water-soluble vitamins than mature milk, while it contains more protein, fat-soluble vitamins (E, A, K), carotenes and some minerals such as sodium and zinc. Beta-carotene gives the yellowish color and sodium a slightly salty taste (UNICEF, Chile, C Shellhorn, V Valdés. Ministry of Health, 1995).

Another important fact of the breastfed is the high lactose content, 7 g / dl (about 200mm). Lactose seems to be a specific nutrient for the first year of life, since the lactase enzyme that metabolizes it is only found in infant mammals while they are fed with breast milk. Hence, most people have lactose intolerance after childhood. In Europeans and other populations the enzyme lactase persists in adults, apparently due to a metabolic adaptation.

Lactose is metabolized into glucose and galactose before it is absorbed by the intestine. It provides 40% of the energy, but also has other functions. The galactose portion participates in the formation of the galactolipids necessary for the central nervous system (Casey & Cambridge, 1983).

The high concentration of lactose in human milk facilitates the absorption of calcium and iron and promotes intestinal colonization with *Lactobacillus bifidus*, a fermentative microbial flora that, by maintaining an acidic environment in the intestine, inhibits the growth of bacteria, fungi and parasites.

Besides of that, the high concentration of vitamins is in a right proportion for the child. As part of the list, vitamin A and vitamin K who helps with their intestinal flora. But also, people can find vitamin E, Vitamin D which goes together with a good sun exposition; it is for that reason that pediatrics recommend to the mothers expose the babies on the sun early morning. So, it helps with the production of vitamin D. Iron, zinc, calcium and phosphorus. In some cases, when children do not get enough iron from the breastfeeding, they could get anemia which is one of the highest mortality causes in children but also in mothers when they are pregnant.

In children breastfed exclusively with breast milk in the first 6-8 months of life, iron deficiency anemia is rare. Children suckled by well-nourished mothers have enough iron in their hepatic deposits to cover their needs for a good part of the first year of life (Picciano, 1985). Recent studies have shown that the early introduction of other foods into the diet of the breastfed child alters this absorption.

It has also been shown that supplemental iron can cause problems by saturating lactoferrin. By decreasing its bacteriostatic effect, it promotes the growth of pathogenic germs that can damage and cause sufficient bleeding in the intestine (detected microscopically) to produce anemia due to lack of iron (Oskey, 1985). On the other hand, the addition of non-heme iron can reduce the absorption of copper and zinc.

Another strong reason to give exclusive breastfeeding to the child, it's the multiple enzymes has different functions. Some reflect the physiological changes that occur in the breasts; others are important for neonatal development (proteolytic enzymes, peroxidase, lysozyme, xanthine oxidase) and others increase the digestive enzymes of the infant (alpha-amylase and lipase stimulated by bile salts). Many of them are found in higher concentrations in colostrum than in mature milk. Lysozyme is bacteriolytic against Gram-positive bacteria and can protect against some viruses. There are enzymes that have direct immunological functions and others that can act indirectly, promoting cell maturation (Werner et al., 1988).

Finally, when we talk about obesity, there are so many factors that might help children to get overweight. The OMS and UNICEF have called to the countries to increase the practices of breastfeeding as a the right of food. Moreover, it should work in parallel with

a good water treatment, sanitation and hygiene. As experts, we need to find the ways to improve WASH system for children, mothers, but also for vulnerable communities in Latin America countries including Guatemala, Brazil and Colombia. The Pan American Health Organization (PAHO) highlighted the region has made progress and implemented health reform, however, 30% of the population lacks access to the care that they need. Health is a fundamental human right, it's not a privilege or a commodity. It should be relative to right, nutritious and good access to food.

The connection between food and nutrition has a key role. It's urgent to make a call and make an effort in the region to enhance the food system so people or consumer can take a turn for the better access to food. The link between food and what people are eating should have an important attention. Transforming healthy diets from sustainable food system should be part of the food planet system. A global consumption of fruits, vegetables, nuts and legumes should be double, a diet rich in plant-based foods and less animal source would improve health and environmental benefits. Latin America as part of the study needs to take an action, the world is facing one of the biggest challenges and it needs to meet the United Nations Sustainable Development Global Goals (SDGs) and change the staggering number of malnourish children but also poverty affecting the most vulnerable communities.

Chapter Five

Recomendations

The primary purpose of this research paper was to explore if food and agriculture system either frustrates or fortifies the socioeconomic level in Latin America. It has focused three main countries in the western hemisphere, Guatemala; Colombia and Brazil. Each one with a different history, background, market, and socioeconomic levels. As the primary objective of this study was to determine Guatemala current situation in terms of malnutrition and poverty, but also how it has a significant impact on the region where the community is vulnerable and the government is taking actions in a slow way with lack of resources and capacity of governance.

The relation between food, agriculture and nutrition is significant, food security is a complex issue and it has different viewpoints depends of the geographical perspective. The major problem of food security is in particular the deficiencies that may lead the system across the world. The current situation is affecting numerous communities causing poverty because nobody can imagine what could be the sensation to go to the bed without food, or wake up the next day and do not have nothing to eat or at least the hope that person could get food but it's unknown due to the situation might be violence, war, lack of infrastructure, unemployment or a corrupt system.

The economic development of the region has a crucial impact on food security, but it also expose the strong correlation between affordable food and security. Moreover, the efficient and functional policy is crucial, countries most of the time have higher political stability risk and corruption levels where it makes the system weak and fail to provide appropriate governance, regulation, and strategies can make stable the food system

though a solid supply chain where people can get affordable food. But not only that, the nutrition part plays a key role. The quality of food is the biggest concern. People's diets should be more nutritious with high levels of micronutrients and vitamins including iron, vitamin A, zinc and vitamin D.

Geographically, Central & South America can be divided into different socio economic regions. Most of the Central America and Caribbean countries are placed behind with a problem reflecting in lower income levels, including Guatemala which explain the weaker food system affecting the population in the western highlands but also the damage and threats of the weather is another major issue. Migration is impacting the system due to the lack of opportunities; the political system is not consistent and it has a major depredator, corruption.

In Brazil, social programs like "Bolsa Familia" improved and promoted education and healthcare. During Lula Da Silva administration, it was a key to integrated social policies for food and nutrition; but also the government invested in sanitation, clean water and hygiene. However, it was not for a long period because Silva's administration got caught in corruption, and the situation changed.

Brazil is an agricultural powerhouse and a large global exporter. Brazil is also the greatest leader in biotechnology and biofortification. However, agriculture infrastructure remains a constraint. With the current administration, experts and local people have started to say it might affect the country due to the rise of populism but also the political decisions cutting the food and agriculture aid which it is valuable for the country and further investors over a short or medium term.

On the other side, Colombia should create a strong package to improve food production, agriculture system but also protect and secure farmers in the region. Food must be affordable and available; the government in Colombia should be ambitious and create food policies enhance the system so, the population can get nutritious food although it is not only for internal consumption, the food system should be strong and be part of the globalization where Colombia can export high quality food with great standard; it will boost the agriculture system and expand the market with new partners.

Food security means to have enough food at all times for a healthy and active life. As part of this research paper was also integrated the further scenarios with a analytical frameworks designed to establish the implications of differences sociopolitical economy influenced by food system. We recognized the impact of social, economic, and demographic heterogeneity but also the effects and impacts of global climate change should be integrated with the sustainable food system strategies.

Following the Sustainable Development Global Goals at the United Action are number-one for the region, the challenges to enhanced the region's capacity to design and implement policies in parallel with investments are part of the global and country-level economy dynamic. But it also part of the macro and micro techniques part of the geographical positioning tools with the risk-scoring tools for investment prioritization and methods control the system. One of the main recommendations, Latin America region should invest more in human capital, it is critical to create more investment although the region should integrated private sector in the plan to create efforts that ends poverty an malnutrition through a sustainable system.

To establish the relation between agriculture and nutrition, in the region has a rapid growth and several anthropometric child feeding indicators measure the highest rates of malnutrition including child stunting, wasting and overweight. The impact of agriculture on children existed based on the maternal nutrition. The composition of the food basket through supply chain and demand-side interventions should have large scale agricultural programs so it might improve the nutrition outcomes. The green revolution were led by the research and development of improved rice, wheat and maize along with policies to promote that expansion of irrigation, fertilizers and inputs. Norman Borlaug wanted to feed everybody but the most important investment was through calorie consumption and national food security.

Guatemala, Colombia and Brazil are the biggest consumers and producers of the main three crops based on the green revolution along with other varieties crops including peas, broccoli, cocoa, coffee, sugar, beans, bananas, variety of exotic fruits as passion fruit, and tropical one as papaya. As part of the list broccoli, watermelon, cantaloupe, mangos, avocado, livestock and fishery.

To challenge the variety of crops between nutrition and the 1,000 days as a crucial time for children, we analyzed how mothers are feeding their kids but also the paper highlighted program as school feeding with free meals at school along with social programs has helped people's education level and healthcare.

Developing countries have biggest challenges in the globe, they need to create mechanism where farmers can be resilience. Latin America needs to have stronger food policies where food will not be an issue that affects the security of the region. By 2030,

the food and agriculture system might be strong enough to feed double of the population, and create sustainable system where food must be affordable, accessible, available, acceptable but nutritious. With it, the association between food security and sustainability should be solved through a new series of efforts and political way for the good well of the country.

Finally, the hypothesis accomplished three developing countries in Latin America where Guatemala is the body of the paper as a result of the worst levels of poverty, malnutrition and lack of governance. Then, comparing the current situation in Brazil and Colombia where are working together in implement technology to produce food, have better sources and improve their commodities with a challenge project to achieve the Sustainable Development Global Goals with the purpose to eradicate poverty implementing strong food policies and improve the trade agreements with the United States, but also Europe as a value market.

Latin America could be crucial in terms of sustainable food system and agriculture, the region might be the leader in feed the future but also it could be the leader in other regions like Africa with a spatial perspective to biofortified food crops. The Research Search in Agriculture and Applied Economies mentioned micronutrient malnutrition affects 2 billion people worldwide, the process of breeding and delivering staple food crops should be higher micronutrient content and it could prove to be a cost-effective strategy for its alleviation. Doctor Carolina Gonzalez who is the director for the Latin America region at CIAT developed a strategy package for Colombia as a country investment opportunities in biofortification. In order to guide strategies for geographic targeting and intervention within country, we set statistical conditions for each sub-index and classify

geographic targeted areas as areas of: (1) impact and intervention, (2) impact, or (3) intervention.

In Colombia and Brazil case study is important to identify the hot spot, these areas with high consumption and high risk of micronutrients deficiency, but also these areas of intervention are hot zones for production and a spatial interaction index derived from an economic gravity model. Organization like CIAT, propose five micronutrient-crop combinations at department level based on the subnational BPI index. These include: vitamin A-cassava, zinc-rice, vitamin A-yellow maize, zinc-white maize, and high iron-beans. In this paper we present a review of the empirical results for zinc-rice (González, S. Perez, E. Birol, M. Moursi, and M. Zeller, A spatial perspective to introducing biofortified staple food crops in Colombia, 2015, EAAE Seminar).

Following that and as a conclusion, the world should be prepare and take action in include new agricultural mechanism for innovation including three key variables consumption, production, and micronutrients deficiency as part of the global convener program on biofortification where countries like Brazil had already started as part of the ambitious agenda the globe needs to achieve.

As a conclusion, food security is playing a remarkable role not only in the market but also in their respective countries and region across the globe. Characteristically determined greater alimentary securities for the respective denizens. The trend is establishing greater market concentration where the resources need to become stronger, stable, safe and without disruptions where resiliency is part of it but also the role of the society beyond politicians, scientist and the public preserve a positive social mechanism to favor and

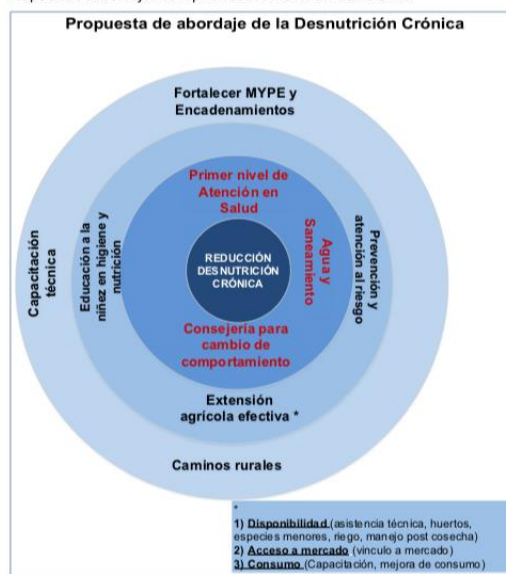
enhances community stability and fortitude with future facilitation of efficacious access to sustainable food system.

Consequently, it is the position of the researcher to find the necessary ways argument and advocate the various sustainable pathways to connect food with nutrition and world's need. Yet, as a researcher, the world need to preserve and plan policymaking in order to keep the valuable work of farmers because thank to them people can have food on the table. However, farmers are the most vulnerable population due to the constantly threats regarding food insecurity.

Graphics

En el proceso de definición de la propuesta de abordaje para la reducción de la desnutrición crónica, se partió del marco conceptual inicial que se presenta en la figura 3. En el mismo, como acciones imperativas, se presentaban mejorar la atención materno infantil, en el marco del PNA, con el fin de asegurar la implementación de las intervenciones de la Ventana de los Mil Días, identificar la manera mas eficiente de realizar la consejería para cambio de comportamiento e invertir focalizadamente en agua y saneamiento. En un segundo plano se presentaban intervenciones enfocadas en la educación a niños y niñas en higiene y nutrición, el Sistema Nacional de Extensión Rural - SNER- para mejorar la disponibilidad, acceso y consumo de alimentos y en un tercer nivel fortalecer las micro y pequeñas empresas -MyPE- y encadenamientos y los caminos rurales. Este esquema fue modificado en los talleres de definición estratégica.

Figura 3
Propuesta de abordaje inicial para reducir la desnutrición crónica



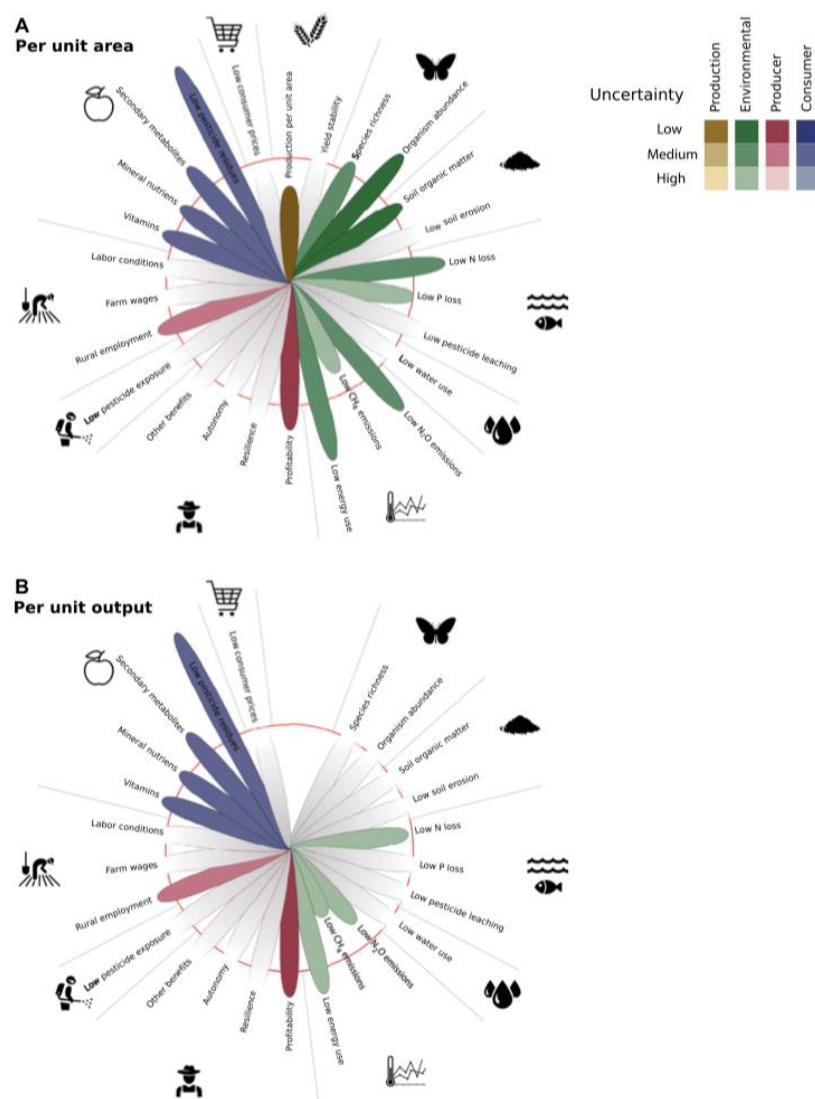
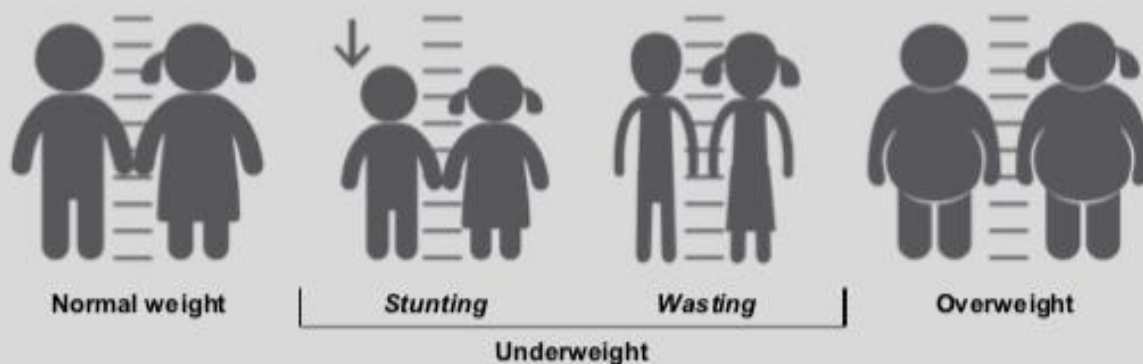


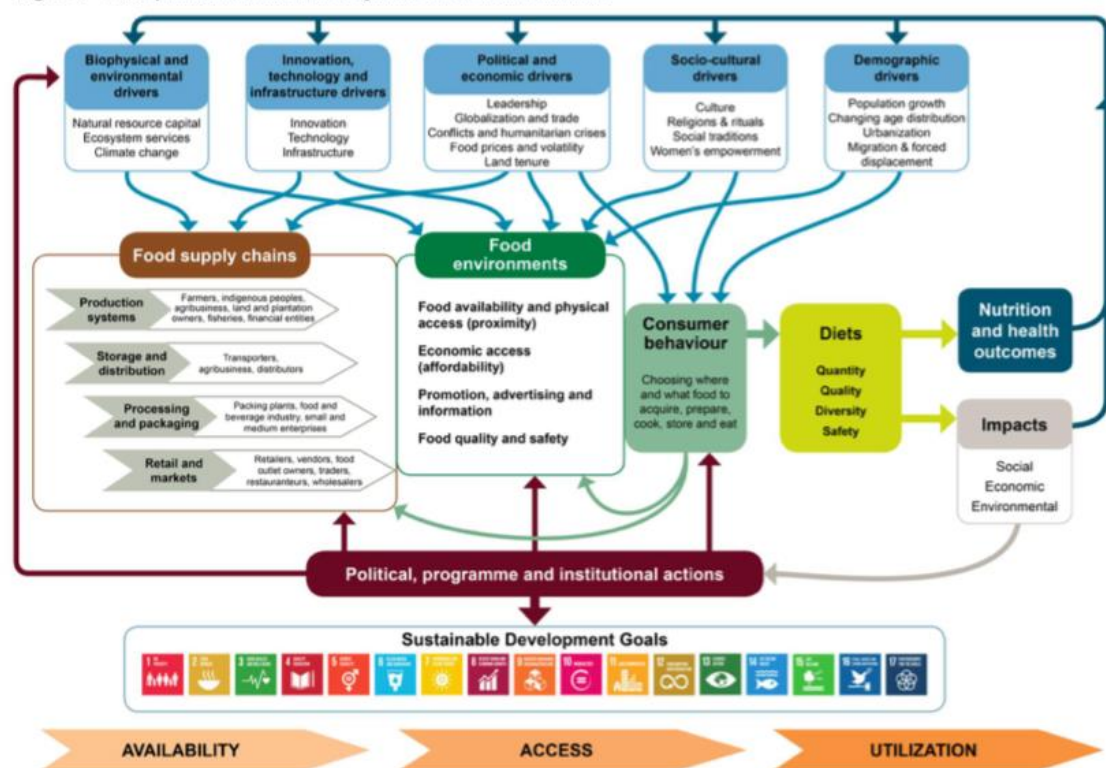
Fig. 1. Overall average performance of organic agriculture relative to conventional agriculture (indicated by the red circle). (A) Performance per unit area and (B) performance per unit output. Figure includes production (brown petals), environmental (green petals), producer (red petals), and consumer (blue petals) benefits (petals that extend beyond the red circle) and costs (petals inside the red circle). Dimensions assessed include (starting at the top, going clockwise) production, biodiversity, soil quality, water quality, water quantity, climate change mitigation, farmer livelihoods, farmer and farm worker health, farm worker livelihoods, consumer health, and consumer access. Larger petals represent superior organic performance (for example, a larger petal for N loss means lower N loss in organic). In addition, note that per unit output performance is only relevant for environmental variables; other petals are unchanged relative to per unit area performance. Shading of petals represents level of uncertainty for each variable, with uncertainty determined by the number of primary studies included in each assessment and the level of agreement between different quantitative reviews (see fig. S6 for details). Variables that could not be quantified are in gray. Length of gray petals also varies slightly depending on whether the qualitative assessment of each dimension (see Table 2) is uncertain or suggests no difference (that is, petal is on the red circle) or shows higher (that is, petal extends beyond the red circle) or lower (that is, petal is inside the red circle) performance. Means used to quantify each variable (also known as petal length) were calculated as weighted means (weighted by the sample size, typically the number of observations in each quantitative review) across estimates of response ratios (organic/conventional) from different quantitative reviews (see table S1 for sources and figs. S1, S2, and S5 for values used) and are represented on a log scale to treat changes in the numerator and denominator the same (with the red circle indicating no change, that is, $\log(\text{org}/\text{conv}) = 0$). Note that this approach does not account for double-counting of primary studies included in multiple quantitative reviews or meta-analyses. This double-counting might affect petal size but would not alter qualitative size relationships among petals.

Figure 4 Common indicators for assessing childhood malnutrition



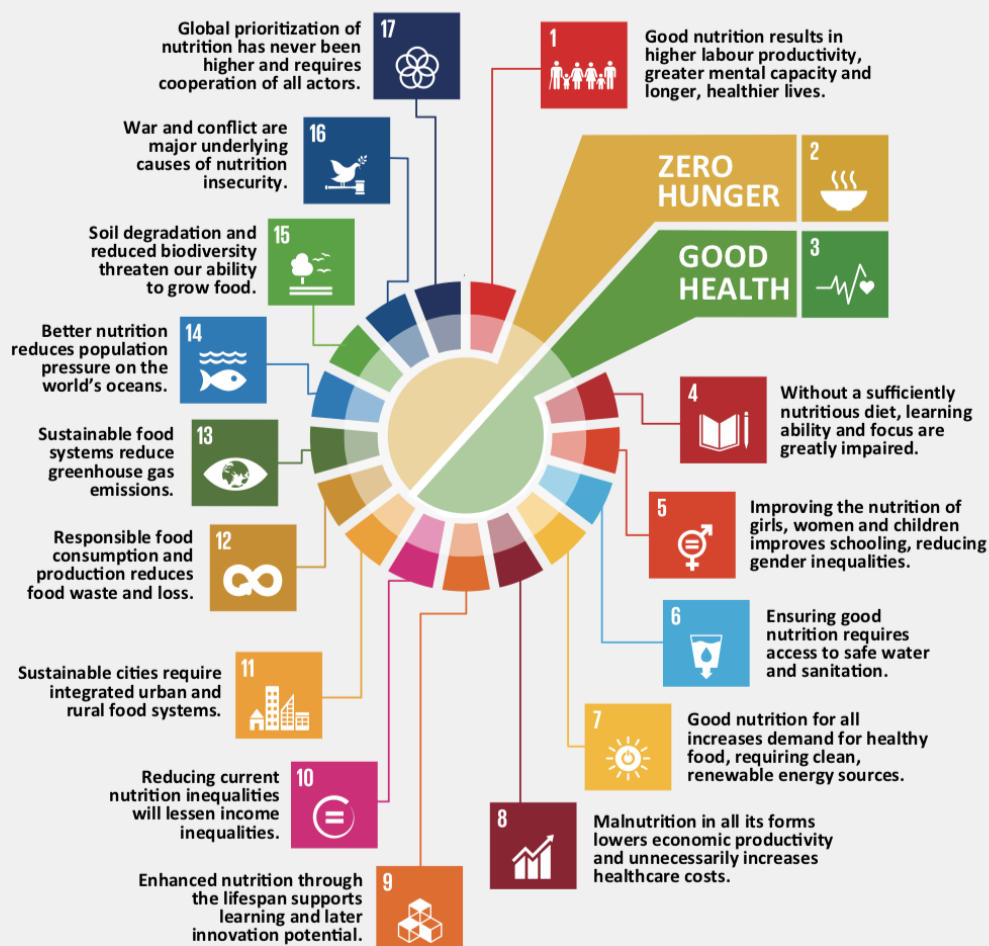
Source: Adapted from UNICEF (2016a).

Figure 1 Conceptual framework of food systems for diets and nutrition



NUTRITION AND THE SDGs

CENTRAL TO THE 2030 AGENDA



UNITED NATIONS DECADE OF
ACTION ON NUTRITION
 2016-2025

SOURCE: WHO Department of Nutrition for Health and Development, 2018.

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