

The Zero Hunger Program in Brazil
An In-depth Analysis and New Challenges

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1. INTRODUCTION

According to the Food and Agriculture Organization of the United Nations (FAO), there were 19.9 million hungry people in Brazil from 2000 until 2002. This number was reduced to 10 million in 2014 of approximately 200 million. The figure of 10 million represents less than 5% of the total population. Currently, around 7 million Brazilian people are hungry representing 3.5% of the population. The statistical decline in hunger⁵ has been assigned to governmental social actions implemented in Brazil since 2003 in a strategy called the Zero Hunger program. A short documentary called *Zero Hunger: Brazil's Dream* launched in 2012 by the FAO shows what the goals of the government were at the onset and what this plan has accomplished. The documentary starts showing the implementation of the pilot project in the remote arid area of Guaribas, Piauí and how the strategy evolved and succeeded in that region. The remote arid areas in the northeast are the ones that suffer more from hunger⁵ because the lack of potable water prevents their communities from locally growing nutritious food and because the lack of potable water for consumption causes diseases that lead to malnutrition⁶. The documentary also describes actions that were implemented countrywide after the success of the pilot project. There were actions specifically designed for the urban centres in order to reduce hunger⁵ among the urban poor communities given their limited living space and the little possibility of growing individual family gardens, and also because of the different way of life in urban settings.

According to the documentary, in the rural setting, priorities were given to improving the access to fresh water in arid regions of the country; improving adults' literacy levels to allow more access to the labour market; evaluating the nutritional status of children under five; creating food production cooperatives; providing loans for food production initiatives, and improving food access to remote areas. In the urban setting, the actions have included the creation of community kitchens; community gardens and food banks. In both, the rural and

the urban environments, nutrition programs in schools have been improved. The initiatives proposed by the strategy focused mainly on the improvement of social determinants of health in Brazil that were preventing hunger⁵ to be reduced or eliminated such as income inequalities, low literacy levels and lack of access to basic needs such as adequate employment.

The initial intent of the program was to give an urgent solution to the lack of access to food in order to reduce hunger⁵. The results of the emergency actions were very satisfactory according to national data collected in the first year of the implementation of Zero Hunger in 2003 and comparative data collected eleven years after the implementation. According to *Instituto Brasileiro de Geografia e Estatística* (IBGE), an official government organization that collects populational data and is responsible for the census in Brazil, data shows that after the implementation of the strategy in 2003, there was a decline of 82% in hunger⁵ in Brazil with 7.2 million of hungry people in 2014. A reduction of 82% took Brazil out of the world hunger⁵ map.

Another important study called *Pesquisa Nacional por Amostra de Domicílios – PNAD* (National Research of Domestic Samples) conducted in 2004 and 2009 in Brazil compared the levels of food security² in Brazilian homes during these different periods. The study showed, for instance, that some families had access to food every day, but the food did not provide enough calories for all members of the family. The analysis of this data is available on the *Instituto Brasileiro de Geografia e Estatística* (IBGE) website. According to this report in 2004, 34.9% of the homes had some level of difficulty in accessing food and in 2009 this number dropped to 30.2% (IBGE, PNAD, *Segurança Alimentar 2004/2009*:33). The decrease of almost 5% in the food security² levels may have some connection with the Zero Hunger policies to improve access to food.

Hunger⁵ is a global problem and Brazil efforts in 2003 were made in an attempt to find ways to cope with this complex issue. In addressing this matter it is important to keep in mind that the general definition of hunger⁵ considers only the lack of food to satisfy someone's energetic needs, without giving consideration to the quality of food. One purpose of this paper is to show that is important to consider not only the quantity but also the quality of food consumed. Since the middle of the twentieth century, the concept of hunger⁵ in Brazil was expanded including the lack of micronutrients such as vitamins, minerals and amino acids (Castro 1952:X). The expansion of the term was due to a research made by the renowned Brazilian doctor Josue de Castro in a trial to build a map of hunger⁵ in Brazil. Castro showed that eating behaviors varied in different regions of Brazil and it lead to different patterns of nutrition deficiency or excesses. He was trying to show the impact of inadequate eating habits more than 50 years ago stating that only the lack of energy consumption was not considering other kinds of malnutrition⁶ problems that can be found in a continental country like Brazil. People that are engaged in eliminating hunger⁵ would have to incorporate the concept of malnutrition⁶ when developing new policies. Malnutrition⁶ or *hidden hunger* may occur when people have enough food, but the quality of food available is questionable. Unequal food distribution is another issue to be considered in relation to the problem of hunger⁵. It is important to remember that the problem of hunger⁵ in Brazil was not caused by insufficient food production, but by unequal access to it, which is also the case in many other countries so Brazil is setting an example.

Malnutrition⁶ and *hidden hunger* are commonly associated with insufficient energy or nutrients consumption. However, malnutrition⁶ may also be related to the excess of nutrients or energy consumption that impact individuals' nutritional status. Today, both scenarios are present in Brazilian society where overweight and undernutrition may appear together in the same family. These families nucleus in which the undernourished and the overweight

individuals share the same space is known as double burden of malnutrition¹ and is caused by the nutrition transition⁷. The nutrition transition⁷ represents a significant challenge for the Brazilian government and civil society. The decline of hunger⁵ in Brazil was a very important step achieved by government and civil society's united efforts, but the challenge now is how to approach nutrition transition⁷ considering the accelerated increase in the levels of overweight and obesity in the country. The documentary called *Globesity: Fat's New Frontier* released in 2012 shows how the predominance of unhealthy choices and mainly processed foods in developing countries are affecting the health of their population. The documentary shows the impact of processed foods China, Mexico, Brazil, and India. The discussion of the topic in this paper started with the analysis of the two documentaries, *Zero Hunger: Brazil's Dream* and *Globesity: Fat's New Frontier*. Both are very effective in raising awareness about the multidimensional characteristics of hunger⁵. *Zero Hunger: Brazil's Dream* describes the program and how diverse approaches in different sectors of society are aimed to reduce hunger⁵ in the population. *Globesity: Fat's New Frontier* helps understand the challenge for the population that now have access to food, but acquired poor eating habits. The documentary *Globesity: Fat's New Frontier* also shows that globalization is a strong factor contributing to the changes in the eating habits of the population and contributes negatively to the increase in overweight and obesity. According to *Globesity: Fat's New Frontier* emerging countries are the most affected by globalization as the food industry is massively investing in these countries. In 2010 more than fifty percent of the population in Brazil was overweight or obese, which is more than 100 million people. The annual cost of treating problems related to obesity in Brazil is around 8 billion US dollars. The solution proposed by the researchers from the documentary *Globesity: Fat's New Frontier* is to increase food taxation and regulate the food market. They also state that population and governments have to find solutions to improve health. The title of this

documentary is purposely joining the words globalization⁴ and obesity and it is suggested through the whole movie that solutions have to address the impact of globalization⁴ in the current Brazilian scenario of nutrition transition⁷ as well as for the other countries cited.

This paper will bring a complete description of the strategy, including the recognition of actions that improved the nutritional status of the population and the new challenges of the governments and society in relation to the rapid increase of overweight and obesity in Brazil mainly caused by the influence of globalization. One objective of this analysis is to recognize the achievements of the program in relation to the comprehensive reduction of malnutrition⁶. The other objective is to include globalization in the discussion about policies that should be implemented or improved in order to reduce the levels of overweight and obesity in Brazil. This study aims to raise awareness about the impact of globalization in Brazilian eating habits and how the Zero Hunger program and its succeeding policies can help address this preventable issue that is a burden for the country.

2. METHODOLOGY

This paper will be based on two documentary films already mentioned in the introduction called *Zero Hunger: Brazil's Dream* and *Globesity: Fat's New Frontier*, and review of existing written literature. The report *Fome Zero: A Experiência Brasileira (Zero Hunger: The Brazilian Experience)* discusses documents related to the program. The report was published in 2013 by Jose Graziano da Silva, now former Minister of Food security² in 2003, the year the implementation of the program took place.

Literary sources will help identify the main goal of the “Zero Hunger” program, evaluate its success, and which actions lead to its achievement. Both documentaries and literary sources will help to discuss the types of malnutrition⁶ (*hidden hunger*) caused by globalization of eating habits.

The theory of policy analysis will rely on two books written by theorists Frank Fischer, Gerald Miller and Mara Sidney called *Handbook of Public Policy Analysis*; and Phillip Gregg's *Problems of Theory in Policy Analysis*. These authors state the difficulties of evaluating results of public policies that are often complex due to their implementation through various levels of government.

3. ZERO HUNGER PROGRAM

In his inauguration speech in 2003, the president elected Luiz Inacio Lula da Silva, known worldwide as Lula, stated “*vamos criar as condições para que todas as pessoas no nosso país possam comer decentemente três vezes ao dia, todos os dias, sem precisar de doações de ninguém. O Brasil não pode mais continuar convivendo com tanta desigualdade. Precisamos vencer a fome, a miséria e a exclusão social. Nossa guerra não é para matar ninguém – é para salvar vidas.*” It was a statement of inclusion of those in need in which he was committed to guarantee enough decent food regularly without creating dependency on charity or paternalist measures. His aim was to reduce inequality and eliminate hunger⁵, extreme poverty⁸ and social exclusion. His goals were ambitious in a country that is historically governed and managed by a patronage system that perpetuates inequalities. Before describing Zero Hunger program it is important to introduce some reflections about social determinants of health, Brazil, and the Zero Hunger strategy.

Yazbek describes important aspects of the Zero Hunger Program in her article from 2004 called “*O Programa Fome Zero no Contexto das Políticas Sociais Brasileiras*” (translated as “The Zero Hunger Program in the Context of Brazilian Social Politics”). The main discussion goes around the challenge of implementing a program with social inclusion in a country where social politics are historically and strongly associated with philanthropy and paternalism rather than empowerment of the ones in need.

Yazbek (2004:107) states that from the point of view of the mentors of the program hunger⁵ is mainly caused by poverty⁸ and then, she presents the methodology used by the Zero Hunger program to define the target population. The criterion was based on the concept of poverty⁸ line defined by the World Bank that affirms that the extremely poor are individuals living with one US dollar per day or less. The number of people living in this condition of extreme poverty⁸ in Brazil in 2003 was 44.043 million or 9324 million families and they would be the target population to benefit from the program. It is clear that not all beneficiaries suffered from hunger⁵ as the number of hunger⁵ people in Brazil at this point was approximately 12 million. Comparing data about poverty⁸ and hunger⁵, it can be argued that poverty can cause hunger, but it cannot be considered the main cause without further investigation.

The creation of the Zero Hunger Program was in 2003 during the first mandate of Luiz Inácio Lula da Silva and just following his inauguration speech. During his political campaign, Lula stated: “if by the end of my term, every Brazilian will be able to eat three meals a day, I would have accomplished my lifetime mission” (Finger, 2003:586). He also stated that hunger⁵ was an urgent issue and the actions should be promptly taken. The proposal of the Zero Hunger program was to reduce hunger⁵ with 25 actions and some goals that should be achieved in 4 years (Finger, 2003). Even though the program aimed not to be associated with any paternalist policy, some emergency measures had to take place considering the critical situation of a great part of the target population. The emergency measures were related to money transfer, but they were given conditionally to families that participated in public forums proposed by the program. Also, children in these families should be attending school (Yazbek 2004:108). The commitment of the families in having their children attending school and the claim for public participation in forums would help to

prevent comparisons between the Zero Hunger program and the philanthropic measures adopted by past governments.

The program was created to improve basic conditions of the Brazilian population, known as social determinant of health, that were responsible to perpetuate the cycle of hunger⁵. According to the authors of the program the most common social determinants of health in Brazil at that time were low income, absence of employment policies, increasing unemployment rates, unequal income concentration, agricultural crisis, absence of agricultural policies, decreasing farm products prices and high interest taxes (Silva, Delgrossi & Franca, 2010:18).

Zero Hunger strategy main focus was in the reduction of an important social determinant of health that is poverty⁸. Kofi Annan stated that “the biggest enemy of health in the developing world is poverty⁸”. Ann Kern and Jo Ritzen affirm that “globally, there is a stark relationship between poverty⁸ and poor health: in the Least Developed Countries, life expectancy is just 49 years, and one in ten children do not reach their first birthday. In high-income countries, by contrast, the average lifespan is 77 years and the infant mortality rate is six per 1000 live births (2017:2).” However, not only a high income increases life expectancy; but also the quality of public services provided such as access to reliable health services; adequate infrastructure in the neighborhood; access to good public transportation systems; safe public spaces for leisure, and a facilitated access to varied healthy foods. Moreover, an increase in income should be followed by an improvement of education levels when thinking about reducing hunger and improving nutritional status. The lack of education may exacerbate the impact of globalization on people’s diet by the lack of development of nutritional awareness.

Kern and Ritzen also explain that “poverty⁸ creates ill- health because it forces people to live in environments that make them sick, without decent shelter, clean water or adequate

sanitation. Poverty⁸ creates hunger⁵, which in turn leaves people vulnerable to disease. Poverty⁸ denies people access to reliable health services and affordable medicines and causes children to miss out on routine vaccinations. Poverty⁸ creates illiteracy, leaving people poorly informed about health risks and forced into dangerous jobs that harm their health (2017:2)” Zero Hunger program wanted to reach this complex scenario where poverty⁸ is installed. The mentors of the Zero Hunger program built a strategy that could break the cycle of poverty⁸ and consequently eliminate hunger⁵. The evaluation of the results of the program would be challenging because the program was so broad and complex with immeasurable results in places where no data or unreliable data was collected due to insufficient human resources or researchers engaged in the evaluation of the program.

Also, the Zero Hunger didn't have established standardized and numerically measurable actions due to the continental dimension of Brazil and its diverse population and environments. For this reason, the same actions could not be transferable from north to south of Brazil. For instance, the provision of fresh water through the creation of water pumps and cisterns for people living in arid regions of the northeast of Brazil couldn't be replicated in the south where there is more than enough fresh water available.

Before implementing Zero Hunger program country-wide a pilot project was started in a remote and poor town of Piauí state with a monthly distribution of a debit card of approximately 11 US dollars to 500 people. While addressing the question of hunger⁵, this action was criticized by some nongovernmental institutions because it was relying on the trial of reducing extreme poverty⁸ with money transfer and not improving other determinants of health such as education, housing and quality of water (Finger, 2003). The debit card would be used specifically to buy food and would provide to extreme poor ones access to types of food that they couldn't afford. It would be a complement to their income in order to reduce food insecurity⁴. However, the lack of associated nutritional interventions in the very

beginning of the program such as providing vitamin supplementation and nutrition education could not guarantee that this first action would result in the decline of *hidden hunger* or malnutrition⁶. It would certainly allow the access to more food and increase calorie intake, but it could lead to erroneous choices accelerating nutrition transition. Moreover, the city that was chosen for the pilot project in an extremely poor area was criticized. Critics understood that the program was using the same patronage system by giving money to those in extreme need creating dependency and unconditional loyalty to the current government. In other words, the community chosen for the pilot project would be afraid of losing their benefit and would not feel totally included in society if they could not improve other social determinants of health.

Regardless of all the criticism, the pilot project was considered successful and the program was approved to be extended to the rest of the country and to develop further actions. According to Yvone Stolz et al. (2002:56), after the approval of the pilot project, the amount of money distributed increased to approximately 13 to 26 US dollars monthly and reached more than 40 million people.

The Minister for Food Security and Hunger Eradication started to move forward endorsing the pilot project and further actions such as food relief, school lunches, food banks, and donations as contingency measures that could lead to immediate positive results (Finger, 2003). Another goal of the Zero Hunger program was to implement actions to improve human condition such as economic development, new jobs, minimum income security, land distribution, and incentives for small family farms. In the government's defense, Lula argued that the actions would only be effective with civil participation (Finger, 2003).

For this reason, civil participation was the first step taken in order to align actions with civil society and it was guaranteed after the creation of the National Council of Nutritional and Food Security (CONSEA) in 1993. CONSEA was created after the

mobilization of society concerned about the lack of access to food in the country. CONSEA was obsolete until 2003 and it only became effective in 2004 after the Second National Conference on Food Security. The council would be composed of 75% of members of the civil society and it resulted in the implementation of relevant actions of food security².

Another action proposed after the reactivation of CONSEA was to promote the access to fresh water in arid regions of Brazil. The action was called One Million Cisterns (P1MC) and it aimed to develop strategies for rainwater collection to be available in extremely arid areas of Brazil. According to a statement on the federal government website, in 2015 1.2 million cisterns were already built in arid areas of Brazil and approximately 73 million of US dollars were available to build new cisterns. The cost of each cistern according to the government is 990 US dollars which mean a low investment with a great positive result for the population. The access to fresh water would contribute to develop vegetable gardens, feed farm animals, reduce diseases caused by contaminated water and consequently reduce the risk of dehydration among the vulnerable population such as children, old people, and pregnant women.

As the Zero Hunger program advanced, new policies were created and a structured strategy emerged with three different classifications and four axis to be targeted. The policies proposed in the program were classified as structural, specific and local. The structural policies included actions for “job generation and increasing income; intensification of the Agrarian Reform; universal access to the social security system; school grant program and minimum income; and incentives to family farming (Zero Hunger Summary 2013:23-35)”. The specific category of policies were the ones related to specific population profiles and consisted of “food stamp or food coupon program; expansion and rechanneling of the Workers’ Food Program; donation of emergency basic food baskets; fighting mother-child undernutrition; keeping food security² stocks; expanding the school meal program; ensuring

the safety and quality of food products; and food education programs and education for consumption (Zero Hunger Summary 2013:23-35)". Finally, the local policies were "municipal food security² programs; local programs for metropolitan regions; local proposals for non-metropolitan urban areas (small and medium-sized cities); and policies for rural areas. (Zero Hunger Summary 2013:23-35)"

In order to foment better employment opportunities and increase the population income, many actions took place in the structural policy category. The actions involved, among others, improvement of literacy levels of the population, rising of the minimum income and releasing of credit for the development of local producers (Zero Hunger Summary 2013:23). The costs of the actions proposed in the structural policy were not disclosed in the summary. However, many of the actions described in this policy category were integrated within other policies. The first action with the objective of improving literacy levels of the population was the program called *Brasil Alfabetizado* (Literate Brazil) developed in 2003 focusing on the youth, adult and elderly population. From 2003 to 2012 14.7 million people were benefited by this program. According to IBGE, the prevalence of illiteracy in the population older than 15 years old decreased from 11.61% to 9.92% from 2003 to 2008 meaning the improvement was not significant corresponding to less than 2%. However, further data collected from IBGE comparing the literacy levels in 2007 and 2014 showed a more prominent result with approximately 42% of the population improving their literacy levels. The second action aimed to propose a significant increase in the minimum wage, but it didn't achieve any significant result as the increasing pattern of the minimum wage continued to follow the same percentage of the previous years from former governments. The third action proposing credit releases for local producers were supported by public banks and it would provide financial incentive for the target population to start local food production. The credit releases and the commitment of the government to promote

the commercialization of the food production among public and private organizations would help to improve the income. This set of actions largely contributed to the improvement of some social determinants of health as it was proposed by the program. However, this policy didn't include any actions related to nutritional education. The main focus of the policy was related to the improvement of the economic status of the population and nutrition concerns were not addressed in any phase of the policies such as implementation or evaluation. It would be important to include nutritional education measures that could provide information about the local products nutritional value, for instance. Nutritional education could also be included in the programs of literacy providing healthy literacy. It would be helpful for the population to establish healthy patterns in their diet at the same time that they improve their income in order to decrease the impact of nutrition transition.

The agrarian reform was proposed with the objective of reducing inequality by redistributing land in a more equitable way. The criteria to define the population that would benefit from this policy was based on the 1999 National Household Sample Survey that showed that one million families either had no land or the land was too small in relation to their production needs. They also included in the criteria of the prospective beneficiaries families in which one or more members did not have a job. The amount of money necessary to implement this action would be equivalent to 3200 up to 6400 US dollars for each family. This amount would help to pay for the land and resources for building the settlements (Zero Hunger Summary 2013:24). Cliff Welch states that Lula's discourse regarding agrarian reform changed after he was elected. He affirms that the objective of the agrarian reform was initially political with the aim to develop the redistribution of land to empower society in a socialist regime (2011:1). But later on, it turned into an economic measure to improve the economic profile of the country.

Despite Welch criticism, if either economic development or political reasons would lead to the redistribution of land and empowerment of the population in need, the main goal would be achieved. The number of families that were settled under agrarian reform from 2003 to 2009 reached

around 500.000, as different methodologies displayed slightly different numbers. This number represents 50% of the established goal. According to Welch during Lula government, the impact of agrarian reform, which he named ironically as “market-based agrarian reform”, was almost the same as the impact in the former neoliberal government of Fernando Henrique Cardoso (2011:2). An important cause of this unsatisfying result, mainly for the peasants, is that some lands claimed to be productive and remained with large producers’ ownership. Large eucalyptus forests couldn’t be used as they claimed to contribute to the supply of cellulose. However, peasant movements argued that those lands had no social function and could be considered “green deserts” (2011:4). Considering the nature of this discussion, it is important to keep in mind that agrarian reform as a way to reduce hunger⁵ and provide emancipation of people should take a more political path with the inclusion of society rather than an economic measure that could change taking into consideration the economic status of the country and not the unfair conditions of the peasants regarding land ownership. The great producers continued to keep their lands with their questionable arguments to prove the productivity of their large portions of land that would produce eucalyptus or soy, for instance. This type of production with only one type of grain or plant would also weaken the soil nutrients with a negative impact on future production of different types of plants. It can be said that agrarian reform didn’t take a larger step than the one from the former federal government and it could be more effective with the goal of empowering the rural communities. Further, according to Ritaumaria Pereira et al the agrarian reform was also influenced by globalization as small farms would be a product to be negotiated with big meat producers, for instance (2016:13). The fact that small farmers benefited by agrarian reform would negotiate their land and labor force with major producers means that concentration of land would prevail and agrarian reform would not result in small producers’ empowerment. The small producers would be submitted to major farm exploitation and dependency in order to receive a better financial feedback.

Another policy proposed the development of a Universal Social Security System by incorporating self-employed rural and urban workers that were not part of any kind retirement plan, neither private nor public. The investment would contemplate approximately 2.9 million people and

the cost for the government would be around 2 billion US dollars. The proposal also included the reduction of retirement age for women and would change the text from the 1988 Brazilian Constitution. The current Constitution only foresees the Universal Social Security System for rural workers (Zero Hunger Summary 2013:24-25). This action was not implemented and the age for retirement in fact increased. The argument was that Brazilian expectancy of life was increasing and retirement plans should follow this change in order to avoid financial losses in the State.

Another policy providing School Grants or minimum income incentives would contemplate around 3.3 million children from 7 to 15 years old that were not attending school. The aim of this action was to associate the money with the responsibility of caregivers in keeping children at school (Zero Hunger Summary 2013:25). In this case, positive results emerged such as decreasing in the number of child labor; decreasing in malnutrition⁶ through the access to healthy and balanced meals at school and increasing of children's literacy levels. These benefits would occur just by children's attendance to school rather than the financial incentive received. This action would cost approximately 2.7 US dollars and would provide 43 US dollars per child attending school. Even though the policy was not implemented from a health perspective, the improvement of the school meal plan, which will be described further up, associated with higher school attendance, would contribute to a healthier overall development of the benefited children. Children would receive at least one meal of nutritious food at school.

Another action proposing the development of a plan to allow small farmers to have access to new agricultural techniques and the expansion of their crops was called Program for Acquisition of Food from Familiar Agriculture (PAA). CONSEA would be the public space to evaluate and discuss improvements in this program. Many actions were included in this policy such as "agricultural insurance; priority to domestic production, relying on imports only if there are harvest failures; incentives to public research combined an effective technical assistance policy; a credit policy; incentives to setting up production and marketing

cooperatives; incentives to protecting nature and the landscape through the payment of an environmental income in compulsory preservation areas, among many other measures (Zero Hunger Summary 2013:25)”. The amount of money necessary to implement these actions was not reported in the summary. According to the documentary *Globesity: Fat’s New Frontier* the strong relationship between small farmers and the government were essential for the improvement of the nutritional quality of school meals in Brazil. The government was committed to guarantee an important portion of the meals to be prepared with local producers resources. The critical point of view of Professor Carlos Augusto Monteiro in the documentary in relation to this action is that it was not created with the aim of health improvement, but to increase the income of small farmers. The school meals were certainly improved as they would contain little or no processed food products, but a health claim regarding the nutritional benefits of the improved meals should be included in the policy description. It would be an initial step for further actions addressing healthier eating habits within the school setting. The fact that the school meals were healthier with at least 30% of farm products from local producers should be emphasized to students with nutritional education in order to spread the nutritional awareness beyond the school setting. Children would be knowledgeable enough to share important nutrition information with their family members. Children and youth would be able to learn and teach how to make healthier choices in their daily lives and they would develop a more critical thinking when facing the appealing propaganda of the food industry.

The Food Stamp or food coupons policy meant to replace the basic food baskets with the argument that the basic food baskets could be associated with the undesirable philanthropic measures that were rooted in Brazilian political culture (Zero Hunger Summary 2013:26). The Food Stamp would be promoted as a way to approximate the community with small producers and would improve the local economy. Four basic features are described in

the summary. The policy would provide an extra income regardless of other benefits already received by families; it would require that at least one member of the family participated in educational activities or community services; it would last six months to one year and would be reassessed for eligibility after this period; it would allow the use of food stamps only in registered food suppliers and it would restrict the purchase of cigarettes, alcoholic beverages, sugary and salty snacks and other non-food products (Zero Hunger Summary 2013:26). The program would start by including families already registered in other programs in order to optimize the existent records. The number of families to benefit would be approximately 9.3 million with an expenditure of around 6.4 billion US dollars (Zero Hunger Summary 2013:27). It is noticeable that this policy focused on the quality of the food rather than quantity. Nevertheless, nutrition education would reinforce the importance of choosing healthier food and the reasons to avoid food products that were restricted in the policy. The improvement of the policy including nutrition education would be a large step towards empowerment of the community in regards to their decisions about food consumption.

The changes in the Workers' Food Program intended to include the workers from small companies that were not receiving the same benefits as the ones working in big companies. The small companies would also receive taxation discounts proportional to the food-related benefits provided to the workers as a way to incentive the distribution of better benefits. The number of workers to be included in the program would be 15.7 million with an approximate cost of 65.000.000 US dollars in tax waivers (Zero Hunger Summary 2013:28). The Workers' Food Program criterion is to offer healthy food to workers; however, the form of delivering of the benefit is variable starting from money in food debit cards, food baskets up to real meals distributed in the companies dining halls. It is difficult to evaluate the impact on the nutritional status of the workers benefited by this program with such varied ways of delivering the food benefits. A compilation of data from further studies would be necessary to

get a better picture of this population considering the different forms of delivery of the benefit in comparison to the nutritional profile of workers. Moreover, this policy should engage workers in nutritional education activities inside the company environment that would contribute to the expansion of nutritional knowledge and awareness beyond the limits of the workplace. The incorporation of knowledge and information allows the individuals to analyze the quality of meals everywhere they go and how they should use their food debit cards more wisely, for instance.

Despite the implementation of the Food Stamp Program, the basic food baskets distribution would remain in very specific emergency situations. They would be distributed in places considered food deserts, where the access to food suppliers is difficult. Also, there would be the distribution of basic food baskets in areas where natural disasters occurred such as flooding. Finally, the new settlements under the agrarian reform policy would receive the baskets until they grew their first food production and they were completely settled (Zero Hunger Summary 2013:28).

The policy created to reduce mother-child undernutrition would consist of assisting children younger than one-year-old, pregnant women and postpartum mothers. The policy also intended to provide iron and vitamin supplements as well as milk to children registered in the health care system and social work networks. The number of children benefited would be approximately 1.3 million and the number of mothers 1.2 million (Zero Hunger Summary 2013:28-29). The specific criteria for inclusion such as family income, age and nutritional status were not provided in the summary and neither was the cost involved in this action. The supplementation of iron was established in 2005 through the Ordinance 730 from the Ministry of Health. The iron supplementation is distributed free of charge in health units to children from 6 to 24 months old, pregnant woman and postpartum mothers up to 3 months after childbirth. Pregnant women also receive additional supplementation of folic acid.

Moreover, according to a survey performed in 2006, inadequate levels of vitamin A were found in 17.4% of children and 12.3% women in childbearing age. The supplementation of vitamin A is part of a program called *Brasil Carinhoso* (Affectionate Brazil) through the Ordinance 729 from the Ministry of Health in 2005. Vitamin A is distributed free of charge to children from 6 to 59 months old and postpartum women, beginning during their stay in the maternity hospital after giving birth.

The next policy would be the creation of food stocks that would guarantee food security² of the population. The basis of this action would be self-consumption of the locally produced food and avoidance of imported food whenever possible (Zero Hunger Summary 2013:29). No further detail was provided regarding the creation of these stocks such as in which places would they be located and how much would be the cost of creating and maintaining these stocks; who would be responsible for taking care of the quality and inventory of the stock in order to prevent waste and foodborne illnesses; which food products would be put in stock. This policy could be recognized in the actions from other policies such as Food Stamps, food banks, and small farms. In other words, this policy was probably described separately, but it was incorporated in other policies.

The next policy describes the objective of expansion of the school meal program. The National Program of School Meals (PNAE) created in 1955 to provide meals for school-age children was restructured including the readjustment of the sum that remained unchanged for the last ten years before 2003. The council also established that small farmers from the PAA would be able to provide 30% of the food for school meals which would result in cheapest local products without losing nutritional quality. Moreover, these small food suppliers would increase their income. The changes in PNAE were approved in 2009. The new policy intent was to increase the percentage of 15% of total calories offered to children while they were at school. The summary states that the percentage could go up to 100% according to studies that

were not specified in the summary and that were not found in other literature (Zero Hunger Summary 2013:29-30). However, the goal of providing 100% of the daily needs for children was not achieved as it can be checked out in two resolutions from the Ministry of Education written in 2003 and 2004 respectively. The Resolution 35 from October 2003 does not change the percentage of calories that should be provided for students that would remain in 15%. Also, the Resolution 38 from August 2004 declares that the percentage of calories is 15% for all students, except the ones belonging to indigenous populations that would receive 30%. The need to double the amount of money destined to buy food supplies from 0.04 US dollar per children per meal up to 0.08 US dollars was not achieved but it was close to its goal reaching 0.07 US dollars. It is a low amount, but in general, the states and municipalities add some subsidy to this amount in order to improve the quality of the school menus. The improvement of the school meal program should be followed by nutritional awareness activities in order to raise awareness about the importance of nutritious meals at school and to promote healthier eating habits outside the school environment.

As a complement to the school meal program, an action of supplementation of meals in daycares was implemented in 2007 through the *Programa Saude na Escola* (Health at School Program) that aimed to integrate health in the education setting. The main action was designed for daycare facilities that would provide a multivitamin and mineral supplement sachet to one meal per day ensuring enough of the daily needs of vitamins and minerals for children that have no access to other means of supplementation. All parents have to sign an agreement form allowing their children to join the action. They should receive information about vitamins and minerals in order to prevent the abuse of vitamins and minerals with the erroneous thought that vitamins and minerals are completely safe and they are more effective if taken in higher doses.

The policy that aimed to guarantee the safety of the food products emphasized that the main issue to be addressed was the accessibility to food. It is stated many times in the description of the Zero Hunger program that the problem of hunger is not related to lack of food, but the difficult access to it. This policy also aimed to establish control measures regarding the production of transgenic food as the health impact was unknown at that time (Zero Hunger Summary 2013:30). No costs or specific actions were described in relation to this policy in the summary. However, the actions were probably integrated into other policies related to food production and distribution. In 2003, the Decree 4680/03 was signed by president Lula determining that genetically modified foods should contain an identifying symbol in the label as a way to guarantee for the citizens the legal right to be informed as the health impacts of consuming these products are not clearly known. No further actions related to food safety were described. Food safety should be a priority as it involves the prevention of foodborne illnesses. Foodborne illnesses affect more severely children, pregnant women, elderly people and people with low immunity systems in general. The prevention of foodborne illnesses results in preventing other causes of malnutrition⁶, rather than only not eating enough calories and nutrients, such as dehydration, diarrhea, and vomit.

The policies defined as Food Education Programs and Education for Consumption aimed to orientate the population about balanced eating habits by consuming an adequate amount of nutrients and calories (Zero Hunger Summary 2013:30). Two main sets of actions were proposed. First, there would be nutritional education campaigns with lectures taught by health experts. The second action included the regulation of food products to be followed by standards of the document to be created by the government called *Brazilian Rule for Marketing of Industrialized Food Products* (NBCAI) (Zero Hunger Summary 2013:30-31). However, this rule was not created as it was initially proposed. The rule created to regulate food products was specifically designed to control food intended to infant and toddlers

nutrition. The content of this rule is in the law number 11.265 written in 2006 by the Chamber of Deputies and signed by President Lula. The law established standardized rules of labeling and advertising of formulas that substitute breast milk when breastfeeding is not a possible choice. The objective of this law was to preserve breastfeeding practices by providing information about the benefits of breastfeeding as the first choice for infants exclusively until 6 months and as a complement until 2 years old in the formula labels. The infant formulas were prohibited from developing any kind of marketing appeal that could allege that they were complete substitutes of breastmilk.

The food security² policy designed for the municipal sphere would count on the existent structures from the health system; education, agriculture, and social work departments. The actions implemented in these sectors were already mentioned such as monitoring of mothers and children nutritional status; school meal program; small farmers' production and distribution of benefits respectively. The participation of civil society in the actions would help to evaluate and discuss the real needs of each municipality. The law 11.346 signed in 2006 by president Lula reinforces the relevance of defining food security² as a human right that cannot be subtracted from citizens. In order to guarantee the effectiveness of the law the National System of Food and Nutritional Security (SISAN) was implemented in 2006 with responsibilities that included promotion of food security² through the implementation of food security² policies; integration among civil society and government with the goal of promoting food security², and monitoring and evaluation of food security² levels in the society. This was a successful measure and resulted in the first research, revealing the levels of food security² in Brazilian families, performed by IBGE, the PNAD that was already mentioned in the introduction. The findings served as a guide to create effective actions to reduce food insecurity³ and helped to establish the food security² law, the CONSEA, the SISAN and the PNAD research that was held initially 2004 and 2009 and

continues to be held yearly. PNAD was one of the most important researches leading to the continuous monitoring of food security² and it is still active. Food access is measured through research in food security² levels and contributes to a better evaluation of the population nutritional status when combined with anthropometrical data.

The actions developed to reduce hunger⁵ could not be limited to the rural setting considering the huge population living in urban areas of Brazil and with restricted access to food as well. For this reason, specific actions were designed to improve the conditions of the urban communities also facing the struggles of food insecurity³. It was proposed the creation of “subsidized restaurants for low-income population”; creation of “food banks”; “modernization of food supply facilities”; and development of “new relationship with supermarket chains”.

The subsidized restaurants became widely known as popular restaurants and would provide a complete meal with entrée, beverage, and dessert for 32 US cents. The popular restaurants’ first manual describing the objectives, features and proposed meal prices was released in 2004. The popular restaurants spread in Brazil and they still exist offering nutritious breakfasts and complete lunch meals. Further, food banks were created in order to avoid food insecurity³ and prevent food suppliers from wasting food that was not consumed but it was still safe for consumption. The food banks initiative would be optimized by the *Estatuto do Bom Samaritano* (Good Samaritan Statute) that was a law project willing to avoid the red tape in the acquisition and distribution of food products. This project was created in 1998 as the Law Project 4747, but it was not approved yet by the deputies. Fortunately, in April of 2016, the *Rede Brasileira de Banco de Alimentos* (Brazilian Food Banks Net) was created by the federal government in order to facilitate the acquisition and distribution of food products with acceptance of products that are visually imperfect, but perfectly safe for consumption. The net integrates the food banks, optimizes their communication and allows

the participation of existing food banks in the federal, state and municipal levels. The “modernization of food supply facilities”; and development of “new relationship with supermarket chains” consisted mainly by the commitment of purchasing food from local producers from small and big retailers in order to reduce the price of farm products and increase the access to food for lower income families. All of those settings weren’t associated with nutritional actions or to information availability of processed food products that are so easily accessible after the advent of globalization⁴ even in food banks. In the context of food distribution, nutritional education is essential as many processed food products are donated by food industries. People must be warned about the negative health consequences of consuming processed foods regularly and not occasionally.

The proposals for medium and small cities that are not part of the metropolitan areas of big cities were similar to the ones that were implemented in big cities. They also contemplated the creation of food banks; plus development of partnerships with retailers; modernization of food supply facilities and the creation of urban agriculture. The implementation of urban agriculture would include the creation of ““Farmers’ Fairs”; home delivery of fresh food products; training courses for establishing vegetable gardens in schools; registration of idle urban plots for using them to establish vegetable gardens, allowing them to be used free-of-charge for producing food, for a certain time, by interested unemployed people; and charging of differentiated property tax rates on plots used for this purpose (Zero Hunger Summary 2013:30-34).” The first projects for urban agriculture were approved in 2008 in several states. This type of initiative would help to increase the consumption of organic vegetables as pesticides wouldn’t be necessary to be used in these small urban vegetable gardens. The community gardens would allow communities to share free space to produce vegetables for their own consumption. The first manual of how to develop a vegetable garden at schools was released before the creation of the Zero Hunger

Strategy. It was released in 2001 with simple and easy to understand language, including tips and information about the timeframe of different types vegetables' growth. It was called *Manual para Escolas – Horta* (Manual for Schools- Vegetable gardens) and the authors were nutrition students from a federal university in Brasilia, Clarissa Hoffman Irala and Patrícia Martins Fernandez. The introduction of fruits and vegetables in new environments which were previously unproductive allows different ways to deliver nutrition education. It makes possible to provide education with practical experiences and more participation of the community.

In the rural areas, an important action was the development of family farming as a way of increasing income and allowing self-consumption. Family farmers would be able to sell their products for schools, day cares, and other governmental or private institutions. The government would provide technical support; trusting funds; marketing support with closer communication channels between producers and potential buyers, and improvement of infrastructure in areas surrounding the small farms. The government would also provide seeds, vacant lots access and farm animals for families to produce their own food (Zero Hunger Summary 2013:30-35). In this last case, they would receive the resource for free, but they would not be allowed commercialize their production.

Another classification given to the Zero Hunger strategy was a division in axes that represented the main objectives of the program. The first axis was access to food; the second was strengthening family farming; the third was the promotion of income-generating processes, and the fourth and last axis involved links, mobilization and grassroots participation. Each axis would relate actions that would help to reach one objective defined as an axis.

In relation to the overall results of the Zero Hunger program and its legacy, Arnaldo Campos, the national secretary of Food and Nutrition Security, stated in the *Conferência*

Estadual de Segurança Alimentar e Nutricional do Ceará (State Conference in Nutrition and Food Security in Ceara) in 2015, “we have a lot to celebrate as Brazil is out of the world hunger⁵ map”. However, he also stated that the next step is to fight obesity, which is largely increasing in Brazil. He didn’t mention the influence of globalization⁴ as an important factor leading to undesirable changes in Brazilian eating habits, but this will be further discussed in this paper. The influence of globalization⁴ cannot be overlooked as it may be seen as threatening to the health of Brazilian people.

4. POLICY ANALYSIS

Policy analysis is defined as “an applied social science discipline which uses multiple methods of inquiry and arguments to produce and transform policy-relevant information that may be utilized in political settings to resolve policy problems (Dunn in Fischer, Miller & Sidney 2007: xix).” Policy analysis can be simply understood as a way to evaluate public policies impacts on the population or a way to improve established policies. The importance of evaluating public policies is to verify if it is recommended to keep investing in certain policies, to change the characteristics of policies or to stop policies that are not cost effective. Furthermore, public policies must be developed taking into consideration changes in the population needs that are affected by several external factors and also by the improvement reached by being benefited from past public policies. In other words, public policies cannot be static as they must be developed according to the development of the society.

Phillip M. Gregg in his book *Problems of Theory in Policy Analysis* (1976) states that is difficult to precisely analyze public policies because they are “fragmented and multicentered (p.3).” This type of arrangement prevents the study of “outcomes, process, structure and inputs (p.3).” The lack of communication between the parts involved in the process of developing and implementing a policy prevents from analyzing the effectiveness of the actions.

Policy analysis is not an exact science dealing only with numbers. The analysis must involve people roles as recipients that may give feedback to the State. The improvement in the quality of life of the population must take many factors into consideration such as access to basic needs, leisure activities, and health. This being said, it can be concluded that many indicators are related to public policies such as the ones used to develop policies to reduce hunger⁵. Also, one public policy that is implemented to improve sanitation in communities may result in decreasing levels of hunger⁵ through improvement of health. In other words, the implementation of adequate sewage systems will reduce diseases such as diarrhea and parasites that may lead to malnutrition⁶. Those diseases may cause inadequate absorption of nutrients mainly in children, elderly people, pregnant women and people with low immunity system. The sanitation policy may not be directly related to any hunger⁵ strategy, but it will help to reduce hunger⁵. On the other hand, a policy that is implemented to allow the access to food such as food banks is directly reaching the goal of reducing hunger⁵. In short, policies acting directly or indirectly to solve a major concern of the population will compose a strategy or a program.

Another analysis that can be made is if the policies in the strategy aim to achieve short or long term results and also, if they are supposed to be temporary as emergency measures or if it is a policy to be part of government permanent support to the population. In this last case, a permanent policy should be one that reaches the highest number of people over time but changes the target population as long as they resolve their situation. In other words, permanent policies should not cause dependency on the government and result in the same patronage system that is so widely criticized. Policies based on patronage maintained for an indefinitely amount of time are seen as policies that guarantee an eternal position in power. Patronage creates fear in the dependent population that remains threatened by the possibility of losing their benefits. Moreover, policies that don't empower society usually lack of

educational actions and consequently, are not able to give better results throughout time. Education must be included in all kinds of policies in order to lead to results that can be transferred among generations and that empower population through raising awareness.

Considering the importance of analyzing public policies, despite the problems arising from the analysis, four aspects of policy analysis must take part in the evaluation.

First of all, it is verified if a program is fulfilling the stated objectives, if it is considering unexpected effects that invalidate the program objectives and if it is being more efficient in achieving objectives than other possible ways (Fischer, Miller & Sidney 2007:231). In other words, the verification of the program quantifies the cost benefit is measured in comparison to alternative proposals to reach the same objectives.

Second, the validation is when it is evaluated if the program “objective is relevant to the problem situation”, if it is necessary to include exceptions to in the objectives in certain situations and if there are “two or more criteria to the problem situation (Fischer, Miller & Sidney 2007:233).” It is a qualitative evaluation that aims to verify if the objectives defined are in conformity with the situations to be solved.

The third aspect to take into consideration is called societal vindication and it includes the impact of the program in the society. The questions are if the program has a positive impact in society with valued contribution; if the program objectives result in unexpected problems impacting negatively the society and if the benefits and costs are equitably distributed (Fischer, Miller & Sidney 2007:233). This aspect relies on how society values the program as including important problems to be solved in their context.

Finally, the fourth aspect called social choice and it is related to ideology. The aim of a policy is to be cost effective, valid, with good outcomes in society and ideologically accepted. In order to be ideologically accepted, it is important to know the predominant ideology of a community to minimize conflict and reach the goal of establishing the proposed

policy (Fischer, Miller & Sidney 2007:234). For instance, if agrarian reform in the Zero Hunger program changed from the political aspect to the economic aspect, it didn't respect the ideology of the majority of the population that needed to be politically empowered. The agrarian reform only resulted in an increasing in the population income, but it didn't result in the empowerment of the communities preventing their active participation in further political decisions.

5. CRITICAL ANALYSIS OF THE ZERO HUNGER PROGRAM

The Zero Hunger program was created with the ambitious objective of permanently eradicate hunger⁵ and extreme poverty⁸ in Brazil. The first point to be considered in the analysis of this strategy is its broad spectrum that included policies related to agriculture, health, education, employment and money transference in many spheres of the government from Federal to Municipal. Moreover, the strategy was so huge that resulted in the creation of the former Ministry of Social Development and Hunger Elimination (Ministerio do Desenvolvimento Social e Combate a Fome) as a way to integrate the actions coming from several ministries and levels of government in a unique structure. As Phillip M. Gregg stated in relation to public policies, they are usually fragmented and multicentered leading to more obstacles in analyzing their validity. In the case of Zero Hunger program, even with a ministry almost exclusively dedicated to the program, it was difficult to collect information and evaluate precisely all the proposed policies. The results would be measured by evaluating changes in food security² levels and nutritional status at the population. The combination of data would allow to determinate the impact of the program. The limitations of the use of these indicators to evaluate the program are that they may be related to actions developed from other initiatives outside Zero Hunger and also because there were no similar data, in the case of food security², from before the implementation of the program to make a reliable comparison of the population before and after the program. Finally, the increasing levels of

overweight or obesity could also be related to the program as the access to food was improved, but the access to nutrition education didn't improve in the same proportion.

In terms of difficulties in analyzing public policies, it was not different for Zero Hunger that aimed more than only reduce hunger⁵, it aimed to eliminate extreme poverty⁸. So the policies would be directly and indirectly related to hunger⁵ which would make it even more difficult to analyze. Some of the statistical data used to determine the results of the strategy didn't really show relevant improvement as it was verified in the case of improving literacy levels that only reached less than 2% of improvement in five years. The prominent changes in literacy levels really occurred from 2007 until 2014 as it was mentioned in the description of the program. The reason for more significant results happen a few years after the implementation of the program may have many reasons such as the expansion of the actions; development of more human resources, and improvement of the policies. However, the decrease of illiteracy is only an isolated indicator and it should be associated with other indicators in order to verify the influence in the changes on the prevalence of hunger⁵ and further research is necessary.

Nevertheless, it is impossible to deny that the Zero Hunger program was maybe the most important strategy to cope with the problem of extreme poverty⁸ and lack of access to food in Brazil resulting in the creation of several programs that are still active. However, some aspects of the program were criticized and some actions were lost in terms of implementation, evaluation, and comparison of previous data. Also, the program overlooked the problem of globalization⁴ influencing Brazilian eating habits. It didn't forecast the rapid increase of overweight and obesity and its causes, mainly the incorporation of convenient ready-made processed and fast food in Brazilian daily menu.

Paes-Sousa and Vaitsman article (2014:4354) identified some problems related to Zero Hunger Program mainly concerning the direct transfer of money. Some critiques

referred to the possibility of political fraud and lack of transparency in the information about the benefited families. News about misappropriation of money from the program started to appear very frequently in newspapers and television some years after the implementation of the program. For this reason, the initiatives that involved money transference or even commercialization of food products were the most criticized by society because they are obviously more vulnerable to corruption and conflict of interests. The agrarian reform was also criticized because some settlements were supposedly sublet and the settlers were having profit from lands provided for free by the government. They were not having profit only through the commercialization of the food production as it was defined in the policy related to small farming and agrarian reform. Not all kind of news is reliable, but the most important lesson to take is that actions involving money are difficult to be disassociated from the long Brazilian history of corruption and patronage. If all policies were associated with an educational plan, they would be more reliable and they would be more effective in empowering Brazilian society. Nevertheless, there was an improvement in the population income regardless of the critiques. However, the dependency of the population in money transference programs remained the same as it was in the past.

The best long term achievement of the program was certainly the fact that more children started to attend school and receive healthier meals in addition to the receipt of money. In the adults' case, it is important to emphasize that the access to more food items would guarantee a better energetic intake, but it could not guarantee the declining of *hidden hunger*. For this reason, it is noticeable and it will be further presented data that shows that the adult population presents a more significant increase in overweight and obesity levels than children. The Workers Meal Program should be further analyzed and evaluation of this population should be considered in order to define the best public policies in the work place. People at work that receive the meal benefit through debit cards may be chosen fast food

premises for their meals during their shift in order to optimize their short meal break. Globalization⁴ brought several options of fast food restaurants closer to the consumers to countries that are economically emerging like Brazil. Brazil is the sixth strongest economy in the world and it is an important target for big food industries. On the other hand, actions targeting children and youth were effective in reducing *hidden hunger* by offering supplementation and improving school meals. They will represent a permanent positive effect over time as children grow. In order to be more effective, policies focused on children and youth should include nutritional education raising critical thinking about food products. The majority of the food advertisements directed to children show food products as nutritious and harmless to children's health. Children should develop the ability to understand the negative health impacts of industrialized food if consumed on a regular basis.

The policy that aimed to improve the income of those living in extreme poverty⁸ certainly resulted in further access to food, but it needed to include actions of nutritional education as well to raise awareness and consequently lead to healthier food choices. The implementation of the *Nucleo de Apoio a Saude da Familia* (NASF), which can be translated as Family Health Support Nucleus, in 2008 will be discussed further in the next page. The NASF included nutritionists in the family health teams and it was an important step taken towards the development of nutritional awareness in the population and empowering people to make healthier choices. The role that nutritionists have to play while working for NASF is more than only transmitting knowledge; they must be trained or self-educated to listen carefully to the barriers towards healthier choices faced by the communities receiving support. The fact that nutritionists master the science of nutrition does not guarantee that they master the art of touching people's minds in order to provide long-lasting changes. Nutritionists working in the communities must have in mind that globalization⁴ is embedded in the families' daily lives with appealing propaganda and cheap processed food products

available even in the most remote sites. The documentary *Globesity: Fat's New Frontier*, for instance, shows the Nestle ship arriving in a very remote area of Amazon and distributing their sugary products. The Nestle propaganda appeal is that their products are rich in vitamins and minerals; however, the cost of having this kind supplementation through a very unhealthy type of snack is not worthwhile. Nestle processed food products such as cookies, chocolate bars, and cereal, among others, are extremely rich in calories, sugar, saturated fat, and sodium despite the fact that they provide a significant amount of added vitamins and minerals. It is important to emphasize in the nutritional education that minimally processed food such as fruits and vegetables have vitamins and minerals that are much more easily absorbed without adding extra calories to the daily diet.

Another problem faced by Zero Hunger program was the interchangeable use of the word hunger⁵ and poverty⁸ preventing a better understanding of the impacts of the program in combating hunger⁵. The program started with the main purpose of providing enough good food on a regular basis to approximately 44 million people. However, as described in some articles and also, in the official report, the program became more focused on reducing poverty⁸. In other words, the program, in fact, guaranteed some additional resources to the basic incomes of families, but it didn't provide enough nutritional support with education on a regular basis to the entire target population since its beginning.

In order to fill the gap of the lack of nutrition support to the Brazilian population, in 2008 the government created the *Nucleo de Apoio a Saude da Familia* (NASF) that was regulated by the Ordinance number 154 from the Ministry of Health, which until current days provide remote and eventual direct assistance to the population. The nucleus includes various types of health professionals that were not part of the family health teams in the past. However, the number of professionals is not enough to attend the entire communities as each health practitioner has to give support to five to nine family health teams. A basically

composed family health team includes at least a doctor, a nurse and community health agents. The community health agents live in the same neighborhood where they attend and they have the role of facilitating the access to families and bring the concerns of the community to the family health professionals. Each family health team takes care of a maximum population of 4000 people. Considering these numbers, each dietitian from a NASF must give support to approximately 20.000 to 36.000 people. For this reason, NASF professionals have to focus their educational role in groups to promote health in order to reach the largest amount of people.

Other authors describe the Zero Hunger program and its objectives in their articles, including the guarantee of food security² and access to food of quality in a positive way despite all the criticism. However, they failed to demonstrate which actions are directly coping with these two goals. They repeat the discourse based on two main actions: a monthly distribution of a certain amount of money and the distribution of food donated by different entities. They could mention some of the most relevant policies; the ones that really reached the goal of providing food of quality on a regular basis such as the school meal program and the popular restaurants. The school meal program was improved after Zero Hunger program as it subsidized value almost doubled and the percentage of energy provided increased over the years up to 30% of the daily needs. The aim was to provide 100%, but it is a difficult goal to achieve as children in school age only stay part time at school. The popular restaurants have the supervision of nutritionists that approve the menus and have the responsibility of providing balanced meals. Also, the amount of calories per lunch are approximately 1200 and per breakfast 400. A citizen that is having difficulties in accessing healthy food in big cities will have a nutritious meal with an affordable price in a popular restaurant. Those policies were not only committed to facilitating access to food but they were also committed to

providing nutritious and healthy food to the population. They helped to minimize the negative influence of globalization⁴ in a great portion of the population's eating habits.

Another author, Eduardo Matarazzo Suplicy (2003) describes further actions related to the fighting against hunger⁵ with nutrition support such as the already mentioned restaurants with affordable meals; a program of nutritional education; food donation campaigns; literacy improvement; job promotion; agricultural for small farmers among others (p. 64). But once more, the emphasis of his article falls on the money transfer. The cited actions against hunger⁵ are not further analyzed. Suplicy is a politician from the Workers' Party, which is the same party of the former president Lula, and an enthusiast of public policies that provide a minimum income to people consider to be prevented from reaching reasonable incomes only through their means. So his article lacks to provide further information about nutrition support measures and relies on the defense of the minimum income practice.

Romulo Paes-Sousa et al. (2003) goes further in the discussion about the Zero Hunger program and aims to establish a connection between poverty⁸, malnutrition⁶, and hunger⁵ in the Zero Hunger Program. He analyzes these concepts in order to identify how one aspect can interfere in the result of the other (p. 21). For example, when people receive a better education, which is one basic need to cope with poverty⁸, this action will probably help in the decreasing of hunger⁵ and malnutrition⁶ when the person income is raised through a better job and when the person acquire more awareness about the healthier types and amount of food to consume. Paes-Sousa (2003) includes in his article a critique from a journalist, called Ceres Gomes VÍctora stating that the Zero Hunger program does not define the differences between poverty⁸, malnutrition⁶, and hunger⁵ (2003:25). She affirms that these words are used interchangeably. The interchangeable use of terms with completely different meanings throughout the development of public policies may lead to actions that do not have clear

objectives. If the Zero Hunger program instead integrated the terms during the development of the policies, the result would be a more comprehensive set of actions including health education, income improvement, and public participation. Paes-Sousa also states that there is a lack of public health professionals analyzing the differences in the concepts and he aims to fill this gap. The presence of additional human resources in the public health sector such as NASF is one step towards the development of research showing the impact of all actions implemented by Zero Hunger strategy from a health perspective. NASF opens the possibility of associating the decrease of poverty⁸ with the consequent elimination of hunger⁵ with expanded data that could include detailed information of eating habits in the communities for instance. NASF can develop researchers that may help to define different public policies depending on the findings in their communities. NASF insertion in the communities contributes to an improved analysis of each community and to a better perception of the diversity of the country. The NASF strategy is also helpful in verifying the degree of influence of globalization⁴ in the every diet of their communities.

In 2010, José Graziano da Silva and other authors, former Ministry for Food security² and Hunger Eradication in 2003 presidency mandate in Brazil, organized a long report about the Zero Hunger strategy in order to show the main accomplishments of the program. The report was published in 2013 by FAO (Food and Agriculture Organization of the United Nations). The report not only described the program but also showed the critiques against the program as it will be presented further.

In chapter two of the Zero Hunger report, the authors disclose the main critiques that involve the Zero Hunger program. First of all, the substitution of food complementation to money transfer options would provide better results, but critics state the opposite. Moreover, the authors emphasize the necessity of breaking the cycle of hunger⁵ and poverty⁸ by promoting employment, raising income and decreasing of food prices in order to achieve

better results. The last argument is presented as a way to justify that money transfer aim to be temporary and it will help to improve the basic conditions of the target population until they are completely empowered. However, the fact that some initial actions are considered paternalist weakens the program objective of empowering population. Nevertheless, the idealizers of the program maintained the discourse that those actions were only temporary as palliative measures. However, the palliative actions were continuous because other factors could not be changed such as increasing food prices. As Brazil continued to be commercially opened to globalization⁴ the prices continued to follow the same patterns and they didn't go down mainly when it comes to healthy food options. For this reason, the programs of money transfer were continued and expanded in order to maintain the access to food.

A second critique is about the initial statistics criteria used to define extremely poor people in the program. According to the authors, the statistics can indeed vary according to different research methodologies, but the methodology used for the Zero Hunger program was improved in comparison to other institutions with the inclusion of housing expenses, such as monthly rental or mortgages. The inclusion of these variables allowed visualizing the real amount of money available for food acquisition. The fact that the statistical methodology was improved is a positive point; however, this data cannot comparable to previous ones. The critics also state that the levels of hunger⁵ were already low when the strategy was released and that a different methodology was developed to justify the implementation of the strategy. In other words, critics said that the changes in methodology resulted in overestimated numbers the prevalence of hunger⁵ in Brazil. It is a controversial topic, but the main point is that the motto of the strategy goes beyond statistic; it aimed to include society in the political discussions regarding their needs and it helped to develop several policies that are still functioning and providing support for the population.

The third critique is related to the high cost of implementation of the program and the controversial sources of money invested in the program. In fact, even in the original report the total cost of the strategy is not completely disclosed. The mentors of the strategy stated that some amounts are impossible to be estimated because they vary according to different government spheres. The newspapers criticized that negative impacts in Brazilian economy would happen after the implementation of a program with a massive investment. However, those in favor of the implementation of the program stated that fighting against hunger⁵ overcomes any other worries such as the negative financial impacts (2013:48). It is true that hunger⁵ must be considered a priority and it has devastating consequences in society; however, if policies are not financially sustainable the cycle of hunger⁵ and poverty⁸ will remain as soon as the available funds ran out. Considering the two points of view, public policies must be developed with responsibility and forecasting the consequences with enough funds to have continuity and to have the possibility of changing whenever necessary for their improvement. The failure to include nutrition education in every step of the program since the beginning of the program is also very important because it was not forecasted by the policy makers the rapidly increase in the prevalence of overweight and obesity in the population. Zero Hunger program saw globalization⁴ as a threat to the population by increasing inequalities, but the program failed to see that globalization⁴ also influenced people's diet. Overweight and obesity are risk factors for many chronic diseases such as hypertension, diabetes, and metabolic syndrome. Besides the supposed negative financial impact of Zero Hunger program, Brazil has now a burden in the health system with costly treatments of the diseases associated with overweight and obesity.

The third chapter of the report describes the implementation of the program. Initially, the program would divide the investment into three main actions: distribution of a food card to allow the acquisition of food; assistance in the development of small crops; and nutritional

education with the improvement of families' socioeconomic aspects (2013:54). The problem that became evident in the three main actions was the way the investment was distributed. The hugest amount was dedicated to the food card and the smallest amount was left for nutritional education and family improvement. The initial proposal leads to the understanding that the program was focusing on poverty⁸ and not specifically on hunger⁵. The fact that the smaller amount was directed to educational programs can be a failure in the effort to eliminate *hidden hunger* because the focus relies on the immediate results, but it is not considering the continuity of the program. If the population is not well oriented in their choices and do not develop a critical thought about their eating habits, the problem will remain unsolved. The emphasis on short-term solutions rather than actions based on education and population awareness with long term results takes the critique back to the philanthropy nature of the program. If the program is focusing more on immediate emergency actions, it has to change its profile as soon as the target population reaches the objective of being included and participative in society. The focus has to turn into awareness and education in order to achieve permanent results. Yazbek states that the program was using the same old recipe already in use by neoliberalism (2004:110). In this case, poverty⁸ as a social determinant of health is perpetuated as the population will take for granted the emergency measures and they will not have tools to improve their condition with autonomy.

Anyway, some researchers agree that the only way to reduce hunger⁵ is to prioritize actions that improve the social determinants of health in society. Pedro A. Sanchez and M. S. Swaminathan state that the three main causes of hunger⁵ in Latin America are low agricultural productivity, poverty⁸, and unemployment (2005:357). In this case, the Zero Hunger Program targeted the main points in order to reduce hunger⁵ in Brazil as the actions prioritized small farmers increased production; a basic income for families below the extreme poverty⁸ line and, employment initiatives. However, if healthier food choices were

emphasized in each step and each policy established by the strategy since the very beginning, the problem of overweight and obesity wouldn't increase so rapidly. More than fifty percent of Brazilian people are overweight or obese. Also, the target problem in the Zero Hunger strategy is malnutrition⁶ related to the lack of energy and nutrient intake, neglecting malnutrition⁶ as a problem of excess of nutrient or energy intake as well.

The purpose of encouraging small agricultural production through Brazilian communities allowed people to reduce food insecurity³ and create autonomy in the community. The reduction of food insecurity³ is perceived as the access to food is in the communities' backyard. Also, people are able to commercialize their food production increasing the overall income of the families. However, one barrier still needs to be overcome as in some regions the arid soil still prevents crops to grow. The arid soil is not totally solved. However, the continuous construction of cisterns is a policy that is contributing to minimize the struggle of those living in the arid areas.

Unemployment is another problem that prevents economic growth and prevents people from having their family income to increase. Brazil is a country with great part of the population working informally in which income is not stable. If there is no contribution to the government or private retirement plans these workers will not be able to retire. As the employment measures were not clear in Zero Hunger strategy and the Universal Social Security plan was not implemented, there were no positive outcomes related to this social determinant of health. People living in large urban areas did not have the opportunity of growing their small farms for profit as it happened in small cities and rural settlements. Also, literacy levels of the adult population did not show significant improvement according to data available in the IBGE website. In order to improve the results of Zero Hunger program, actions targeted to improve social determinants of health should be reviewed.

6. NEW CHALLENGES FOR THE ZERO HUNGER STRATEGY

Zero Hunger program was of extreme relevance because it was able to promote social inclusion and improvement of the social determinants of health by expanding the access to food, basic education, and complementary income among other achievements. It succeeded in several policies despite receiving heavy critiques about the source of the funds available. The main discussion was about the possibility of fraud in programs involving money transference. Furthermore, actions related to the improvement of nutritional status were not so emphasized in the news or other public discussions. Considering the importance of discussing the health outcomes and new challenges of Zero Hunger program and other governmental initiatives to reduce malnutrition⁶, the Zero Hunger policies focused on health and nutrition and the ones who lacked the nutritional education element were discussed throughout this research.

The main challenge that Zero Hunger strategy and all the implemented policies will face is how to keep adequate access to food for the entire population and prevent obesity increasing levels. Marcela Jardim Cabral et al state that the program called *Bolsa Familia* (Family Bursary) that arose from the Zero Hunger strategy contributed to reducing some degree of food insecurity³, but they reiterate what was discussed previously in this paper that the money transfer does not guarantee that families would make healthier choices of food (2013:72). A research conducted in Alagoas, which is one of the poorest states of Brazil, revealed some disturbing data about the nutritional status of those who were benefited by the *Bolsa Familia*. The research was developed in the capital city of Maceio with 847 recipients of *Bolsa Familia*, and other government incentives such as milk distribution, from 204 families (2003:75). According to Cabral et al, the findings were controversial with some degree of energy or nutrient deficiency in 17.8% children and 20% adolescents; and with more than 50% adults overweight or obese (2003:77). It is controversial that these findings belonged to the same family nucleus. The overweight and obesity findings in adults are

comparable to the national data, but what calls attention in this research is the presence of two completely opposite nutritional status in the same family. The researchers recommended that preventive and health promotion actions should be associated with the program *Bolsa Familia* in order to engage families in better eating habits (2003:85). In order to get even better results, the actions must have included the awareness about the negative health effects of consuming processed or fast food.

The challenge of coping with obesity and reducing hunger⁵ at the same time is a burden to the health system and a struggle in communities and it was ironically caused by the better financial conditions of society that allowed people to have more access to food. The name of this phenomenon where undernutrition and overweight and obesity happen together is nutrition transition⁷ and in Brazil, it can be related to economic development as Brazil is now among the eight major economies in the world (Conde & Monteiro, 2014:1617S). Conde and Monteiro analyzed the statistical trend of nutrition transition⁷ called by them also, “double burden” when both problems of obesity and undernutrition are found together. However, there is an inverse relation according to the data presented as the undernutrition problems are rapidly decreasing while overweight and obesity are much more rapidly increasing. The ideal scenario would be reducing the prevalence of undernutrition and improving overall health with the population being able to keep a healthy weight and healthy eating habits. Conde and Monteiro observed that children under 5 years old were not overweight or obese, but after this age new trends appeared. In boys 6 up to 11 years old the prevalence of overweight increased from 12.3% in 1989 to 33.8% in 2008-2009, girls from 6 to 11 had an increase from 11% to 30% in the same timeframe (Conde & Monteiro, 2014:1619S). The percentage of male adults overweight in 1989 was 29 and in 2008-2009 was 50. Adult females also increased their weight over time, in 1989 overweight women represented 39.6% of the female population, which was already a high rate, and in 2008-2009

they represented 48%. Even with the high rates of overweight, anemia was present in women. According to 2006-2007 data, anemia was detected in 21.8% of girls from 0 to 5 years old; 37.3% of women from 15 to 19 years old, and 30.6% in women older than 20 (Conde & Monteiro, 2014:1619S). The treatment of vitamins and minerals deficiencies must be done through the prescription of supplements that are not added with calories as Brazil is facing now the problem of overweight and obesity in people who are also anemic.

Conde and Monteiro stated that there was a decrease in the prevalence of obese women associated with their increasing income and educational level (2014:1620S). Once more social determinants of health appear as means to improve overall health. In this case, education played the role rather than isolated income increase. This being said, it can be presumed that a better income associated with a higher level of education play a more significant role in the improvement of eating habits, rather than increasing only the income. The challenge for Zero Hunger is how to incorporate healthy eating habits education or awareness in the money transfer policies.

It is also important to know the eating habit trends of Brazilian society in addition to the statistical data about nutritional status. In other words, rather than researching for anthropometrical data it is primordial to collect information about Brazilian diet. Conde and Monteiro described information for the telephone survey called Vigitel (Telephone-based Surveillance of Risk and Protective Factors for Chronic Diseases) from 2003-2004 and 2008-2009 showing that 15% of Brazilian population was physically active and 18% ate five or more portions of fruits and vegetables daily. The authors state that this number increases as educational levels increase (2014:1621S). Further information about diet will help to define new strategies to cope with overweight and obesity and simultaneously prevent deficiencies.

In relation to the nutrition transition⁷ in Brazil Conde and Monteiro concluded that “in the past decade, 33 million Brazilians have risen above the poverty⁸ line due to the

effects of a combination of market-oriented reforms and progressive social policies. Although this transformation was positive, it also accelerated the directions of nutritional transition in the country and further intensified the double burden of disease (2014:1621S).” The failure to perceive the changes in Brazilian nutritional status since the advancement of globalization⁴ started in the nineties lead the government to the challenge of treating antagonistic nutritional problems.

Considering further information about Brazilian eating habits, the Ministry of Health presents data from 2015 showing that 30% of adolescents eat high amounts of sugary food products and that also 30% of adolescents drink soft drinks on a daily basis. Furthermore, the Ministry of Agrarian and Social Development recognized that the battle against hunger⁵ was won, but the new battle is to reduce the rate of overweight and obesity in the Brazilian population. In 2015 the Decree 8553 was written by former president Dilma Rousseff with the emblematic title of *Pacto Nacional da Alimentacao Saudavel* (National Pact of Healthy Eating). The guidelines of the Pact included policies implemented in the agriculture sector during the years of Zero Hunger program and also propositions to reduce sodium, fat and added sugar in processed and ultra-processed foods. The objectives of the pact are to foment the human right to adequate food; foment the access to adequate amount and quality food respecting regional differences from the country; promote connected actions to reduce overweight, obesity and diseases caused by unhealthy eating habits, and consolidate policies to improve organization and commercialization of the small farms production.

The challenge of implementing this pact faces many influencing factors, but a big one is certainly how to minimize the invasion of globalization⁴ in Brazilian eating habits. It is true that globalization⁴ may impact in people’s eating habits both positively and negatively. The positive side of globalization⁴ is that one can currently eat a Mexican mango in Canada during the whole year despite the weather conditions, for instance. In other words,

globalization⁴ allows people to have access to a diverse range of foods. However, not all foods coming closer to consumers' access are always the healthier options. Moreover, some unhealthy foods that are easier to reach undergo continuous processes of melioration that improve taste, but reduce fibre or nutrient content. Furthermore, in order to taste better and last more food products are being enriched with fat, sugar, and sodium. The new challenge for the government and society is to develop awareness about the risks of eating these ameliorated food products on a regular basis.

The documentary *Globesity: Fat's New Frontier* shows very clearly how those unhealthy processed foods reach the consumer in the most remote sites and in low-income communities. The large food industries embed a message of health in the products by training street vendors and associating the products with healthy people as a marketing strategy. It is critical mainly for children and adolescents that want to fit in their groups and that will often surrender to the market appeals. It is a challenge for mothers as well to prevent their children from eating colourful, tasty and convenient ready to eat foods. Moreover, when someone goes to the supermarket to buy any kind of food, the appealing sugary foods and snacks are just in the way before reaching the cashier. To make things even worse, many food products destined for children are vitamins and minerals enriched which give misleading health appeal to mothers. Picky eaters will end up winning their mothers' resistance when they are worried about the lack of vitamins and minerals in their children's diet. So in addition to the vitamins and minerals acquired by the consumption of enriched processed foods their children will receive extra calories, fat, and sugar. A simple example is a difference between pasteurized juice and the whole fruit. For instance, a box of 200mL of pasteurized orange juice contains approximately 110 calories, zero fibre, 21 grams of sugar and three times the amount of vitamin C necessary for a child. On the other hand, one orange has 47 calories, 2.4 grams of fibre, 9 grams of sugar and 88% of the vitamin C daily recommendations for adults. This

information can be checked at Wikipedia and in labels of juice boxes spread in supermarkets and grocery stores. The difference between these two products is essential to understand how a child can be overloaded with calories, sugar, and even unnecessary excess of vitamins.

Several comparisons can be made between minimally processed foods such as fruits and vegetables and processed foods to show the nutritional advantage of consuming minimally processed foods. In all comparisons it will appear that highly processed foods have lower amounts of fibre and much higher amounts of calories, fat, sodium and sugar besides added vitamins and minerals. Processed foods are much more easily accessible after the advent of globalization⁴ that leads to the open market. These types of foods are more convenient as they do not require further experience of peeling, heating, cutting and other time-consuming food preparation abilities. If, for example, a child is really hungry and the mother thinks he or she cannot wait, those types of foods seem to be the ideal choice. Also, if people have short meal breaks, work far from home and cannot pack their meal safely, those types of foods are also falsely ideal due to convenience. Furthermore, for those who work far from home, there are the fast food chains options that are cheaper and faster than other local restaurants in places where there no popular restaurants available. The challenge of globalization⁴ influence in nutrition policies relies on finding an effective way to rescue the traditional Brazilian eating habits through the awareness of society regarding their health. Also, nutritional education policies should include actions that allow families to learn basic cooking techniques that are currently being lost in Brazilian society.

7. CONCLUSION

The Zero Hunger program was successful in reducing hunger⁵ and creating strategies to cope with vitamins and minerals deficiencies. Many policies focused on the improvement of nutritional status of the population living in extremely poor conditions. Actions involving nutritional education were progressively developed and they took part in the health system

until today. The creation of the Family Health Support Nucleus (Nucleo de Apoio a Saude da Familia – NASF) is one of the most important actions generated from the Zero Hunger program because it allowed the communities to have access to nutrition support, either individual or group. This kind of support in Brazil was expensive and exclusive for the ones living in higher social status. However, further expansion of the NASF is necessary as the number of nutritionists is insufficient to reach all the communities in need of assistance.

The second most important action was the improvement of the school meal program that increased the financial support and changed the scope to allow the purchasing of locally produced food. It benefited the small farmers and it benefited the communities' economy as well. It also helped to keep school-age children from public schools far from the temptations of unhealthy processed foods at least while they are attending school.

The main achievement of reducing inequalities in order to eliminate hunger⁵ was reached through the initiatives that emphasize actions to improve the status of social determinants of health in the Brazilian population. However, as the communities developed the means to have access to food, they also became vulnerable. In other words, without enough nutritional awareness about a healthy diet, they surrender to the unhealthy options available after being reached by globalization⁴. The access to the processed and fast food spread fast and it was absorbed in the daily lives of the Brazilian population. The challenge of the government is now to raise awareness in the population about the influence of globalization⁴ in people's diet and to improve public policies by developing comprehensive nutrition education strategies in the policies created with the objective to improve Brazilian nutritional status.

GLOSSARY

1. Double burden of malnutrition – according to the World Health Organization (WHO) it is the “coexistence of undernutrition along with overweight and obesity, or diet-

related non communicable diseases, within individuals, households and populations, and across the life course.”

2. Food security – according to the Food and Agriculture Organization for the United Nations (FAO) it is "a condition in which all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life". Another definition from Michael W. Hamm and Anne C. Bellows is that it is “a situation in which all community residents can obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes self-reliance and social justice (2003)”.
3. Food insecurity – according to FAO it is "the inability to acquire or consume an adequate diet quality or sufficient quantity of food in socially acceptable ways, or the uncertainty that one will be able to do so”⁵.
4. Globalization - according to Machike Nissanko and Erik Thorbecke “globalization means greater economic integration manifested through increased openness via numerous transmission mechanisms such as trade and investment liberalization; movements of capital, labor migration across borders and within countries; the nature of technological change and diffusion of knowledge and technology; the worldwide information flows; and institutional environments. (2010:797-798)”
5. Hunger - Paes-Sousa defines hunger as a “physical distress related to shortage of food (2003:25).” FAO defines hunger as a state of “chronic undernourishment (FAO webpage – glossary).” Carlos Augusto Monteiro states that hunger is defined as a type of malnutrition which does not satisfy the individual’s energetic needs on a regular basis.
6. Malnutrition or *hidden hunger* – according to the WHO “refers to deficiencies, excesses or imbalances in a person’s intake of energy and/or nutrients. The term

malnutrition covers 2 broad groups of conditions. One is ‘undernutrition’—which includes stunting (low height for age), wasting (low weight for height), underweight (low weight for age) and micronutrient deficiencies or insufficiencies (a lack of important vitamins and minerals). The other is overweight, obesity and diet-related non communicable diseases (such as heart disease, stroke, diabetes and cancer).”

7. Nutrition transition – according to FAO it is “a series of changes in diet, physical activity, health and nutrition.” In developing countries it is generally associated with the weight gain resulting in increasing prevalence of overweight and obesity
8. Poverty - Paes-Sousa further he defines poverty as the “lack of resources, mainly financial, in individuals or in entire populations (Paes-Sousa 2003:25)”.
9. Undernourishment – according to FAO it is “a state, lasting for at least one year, of inability to acquire enough food, defined as a level of food intake insufficient to meet dietary energy requirements.”

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