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Agricultural Policy-Making in Cuba: The Case of Organic Agriculture

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Introduction

"El hombre crece con el trabajo que sale de sus manos."
José Martí[1]

Cuba managed to create "a world-class case of ecological agriculture" (Funes, 2012). In a wider global context where hunger, malnutrition and rural poverty represent the most essential challenges of international policy-making, the Cuban achievement is, indeed, worth of researching upon. In 1991, after the collapse of the former Soviet bloc, Cuban economy suffered an immense loss, mostly evident in the lack of oil. Until then Cuba was importing each year around 12 millions of tons of oil from the USSR (Funes, 2002). The lack of this important energetic input was mostly noticeable in the field of agricultural production which has been deeply dependent on the chemical products issued from oil, such as pesticides, fertilizers, and chemical irrigators. This dependency, which instituted also a significant level of vulnerability for Cuba, was created after the revolution of 1959 when an industrialized and chemistry-intensive model for agriculture was put in place by the Cuban Ministry of Agriculture. Following the downfall of the Soviet Union, Cuba had to choose between leaving its population to suffer from hunger or switching to an alternative that would be both economically and ecologically feasible. A more common-sense and logical approach to food and farming was put in place (Wright, 2012).

The transition that occurred in Cuba can be, even though only metaphorically, seen as a consequence of the numerous processes of "green revolution" taking place in the developing world since the late 1960s. Indeed, green revolution in agriculture is one of the main advances of the twentieth century. Since the late 1960s, this revolution has been dramatically changing the field of agriculture by bringing innovations in terms of technologies and practices of the industrialized countries to the developing world. The latter greeted this shift as an opportunity enabling populations to be fed instead of starving. More generally, a green revolution refers more generally to an increase of productivity of an agriculture, as introduced by the scholar Norman Borlaugh, who spread the US innovative knowledge in the field of agriculture to the Mexican farmers.

[1] "Man grows with the labour from his hands" . (Free translation). Written on a wall in Havana, Cuba. A famous

However, compared to other developing countries like India or African countries, green revolution in Cuba represents rather a metaphor to describe an important agricultural transformation that followed the collapse of the Soviet Union. It was not accompanied, as in other developing countries, by the introduction of innovative pesticides, techniques and irrigators. The loss of food self-sufficiency that is common to many developing countries is due, among other causes, to the adoption of such technology models that are not consistent with the Third World reality. These models are usually characterized by a high dependence on external inputs, high energy costs and intensity and a high consumption of chemical fertilizers and pesticides. Moreover, a significant degree of mechanization and an elevated use of capital can also further limit the possibility of making an optimal use of local resources available, including human beings.

Cuban dependency on external inputs caused a significant degradation of the natural resource base. Negative environmental consequences have touched upon its soil, the degree of its biodiversity and forest coverage (Funes, 2010). As a result, this has lead in Cuba to a catastrophe in the tropical and subtropical rural areas whose numerous natural resources have been destroyed. The dependency on external production inputs, mainly from the USSR, has caused soil erosion and natural loss of soil fertility. The excessive occurrence of pests had become a normality and several diseases affected the population, due to a diminished quality of the potable water. An alarming reduction in biomass and biodiversity was also a part of these changes. In such a situation, it became very urgent for Cuba to promote sustainable, organic and greener agriculture on the basis of a more appropriate use of its local resources. Organic agriculture is not a synonym of the oil deficit necessary for the production of the advanced technologies (Wright, 2012), but it is a modern method of land management that conceives the farm uniquely with its own renewable resources. Nevertheless, a series of limitations has been identified, among others- economic, social and market-related, all of which in turn limited the potential of export of organic products in Cuba, as in other developing countries in general.

Cuban organic revolution happened due to a combination of significant external constraints and an internal necessity. The latter was represented by the imposition of the US embargo on the Cuban economy, cutting Cuba off the supply of American goods, and more importantly, American currency. The external constraint, that influenced the Cuban transition from an industrial-based agriculture to an organic and sustainable one, was represented in the

second place by the collapse of USSR. In this optic, Cuban case deserves to gain a global recognition for its agricultural success. Since 1991, when the main historic event of the end of Cold War dictated a change of course for its economy, Cuban island has been demonstrating an impressive effort done in cooperation with its people to fight the food issue in the country.

In the majority of the industrialized countries, the prevailing view of the Cuban economy is that every industry and every form of service - restaurants, taxis, and accommodation, are controlled by the State. For years, this reality has been largely accurate. Nonetheless, the stagnant economic growth through which the country has been going since the collapse of the USSR and the imposition of US embargo, instituted important reforms in the country, giving a significant decision-power to individual "entrepreneurs".

It is now considered that Cuba has integrated free-market elements into a socialist model, by putting in place an organic revolution (Wright, 2012). For some scholars Cuba is going through a process of institutional change, others deny it (Romero, 2014).

Nevertheless, Cuba of today has gone through the largest conversion of land farming methods that took place in history: from conventional agriculture, dependent on chemical inputs to a model based on organic products. The example of Cuba has provided great inspiration and vision for countries all around the world eager to develop a more localized, sustainable food system (Wright, 2005). This conversion from conventional to the alternative way of agricultural production had its numerous social implications. As far as the economic transformations are concerned, Cuba learned to be less dependent on fossil fuels. From the point of view of the social context, its population did not have to starve due to an innovative and environmentally friendly food system.

The research for this Master thesis was instigated by a deep curiosity I have been nourishing for sustainability and more specifically, for sustainable development and its accomplishment within the agricultural space. In this wider context, I opt for Cuba: a country where I spent two months in the summer of 2015, working as a trainee at the Embassy of Slovakia in Havana, which was itself a result of my immense fascination about the Cuban people, culture, and history.

This thesis aims at being a deep analysis of the food issue in Cuba. From an academic point of view, there is a gap in the scientific literature on the Cuban case from the perspective of sustainable development.

The main research questions I will ask myself throughout this thesis will be to which extent organic agriculture in Cuba can be considered as a choice of sustainable development and what are the main reasons behind this choice. I will later analyze why does a country choose to implement policies of organic agriculture and whether Cuba is on its way to sustainable development. In this thesis, I will also aim to demonstrate that a choice of organic agriculture in Cuba was both an external constraint and an internal necessity.

The theoretical framework that I have chosen considering the context of the argumentation will partially be the *theories of development*. More specifically, my attention will be focused on the theories of modernization, radical theories of development and finally, theories of liberalization. The justification of this choice lies in the fact that the Cuban reality corresponds to a developing country, even though with its own specificities.

Moreover, an important part of this research will focus on the general theoretical framework of *public policy-making*, with an emphasis on policy-making in the field of agriculture. This originates from my conviction that reinforcing and supporting the interconnectedness and interdependence of local food systems should not just be a part of the international development agenda, but a permanent vision of all national governments, translated into concrete policies.

To this purpose, I will demonstrate the positive lessons to be learned from the Cuban example for other countries on their way to becoming sustainable. In order to reach this research objective, my thesis will be divided into four parts:

I. Post-Revolutionary Cuban history and the roots of the food issue
II. Agricultural Policy-Making and its Evolution in Cuba before and after the Revolution
III. Organic Revolution in Cuba
IV. Organic Agriculture and Sustainable Development

In the first chapter, we will address the concept of organic agriculture in Cuba by briefly recalling *Cuban post-revolutionary history* in order to identify the historical roots of the food crisis which began in the 1990s and represented the main input for Cuba to undergo the transformation from a petroleum-intensive to an organic agriculture, on a national scale.

The Cuban post-revolutionary historic context demonstrates that history has been one of the factors forcing Cuba to opt for an ecologic solution for its agriculture.

The origins of this fascinating transformation can be found in a specific epoch of Cuban history, referred through the land and widely recognized as *Special Period- Periodo Especial*. This long period of economic and, most importantly, food crisis began as a result of a dependency on external factors - on the other countries and, inputs received from these- that has been imposed on Cuba even before the victory of the Revolution. In the first place, Cuba has been depending on the United States from a political and economic point of view. With the imposition of the economic embargo on the Cuban state by the US in the early 1960 and its reinforcement in 1992, Cuba starts fully to realize the effects of its dependency and starts suffering from the deficit of external inputs, necessary for its economy and agriculture. In addition, the dissolution of the Soviet Union in 1991 leads Cuba to a total economic collapse and is followed by the start of the so-called Special Period, a decade in which Cuban people suffered from hunger and the availability of food, transportation and medicines drastically dropped. These two historic events represent the main external forces that drove the transformation to sustainable agriculture in Cuba and therefore they require a deeper understanding to open our research.

In addition, an analysis will explain the functioning of the commercial partnership between the USSR and Cuba. This collaboration gave birth to very favorable terms of trade between the two countries, basing itself on the similarity of the political ideologies used by these two Communist countries .

Likewise, we will focus on what has happened in terms of agricultural policy-making after the turning point of the dissolution of the former Soviet block occurred. Our question will be whether the prioritization of local production of food represented for Cuba a way of reaffirming national sovereignty in an international context marked by global political and financial instability markets.

In the second part, we will analyze *how states choose their agricultural policies,* in a general perspective, in order to best satisfy the needs of their populations. Choosing an agricultural policy is dependent on the geographical situation of the country, on the challenges and demands of its market, on the state and availability of the technologies and most importantly, on the availability and access to natural resources of a country. In the developing

world, the most challenging issues are represented by hunger and rural poverty and therefore require a prompt answer by national and international policymakers and cannot be just tackled at the technical level. In this perspective, we will analyze the importance of concepts like food security and food sovereignty for the food issue all over the world. Thanks to this extensive theoretical framework of agricultural policy-making we will be able to interpret the evolution of agricultural policies in Cuba in the aftermath of 1959.

Cuban agricultural policy is put in place by the Ministry of Agriculture, an institution itself worthy of focusing on, because of its rich history. Since the outcome of the Revolution, health, education and housing were issues on which the Cuban government was putting the highest priority (Wright, 2005). Therefore, being able to feed its population represented since the beginning not just a merely socialist concern, but a priority that had to be accomplished.

Before 1959, Cuban agricultural system was characterized by huge American-owned enterprises, so-called "*latifundos*" controlling the majority of food production. With the triumph of the Revolution in 1959, the issue of the ownership was partially resolved (Funes, 2009). Most of the previously American-led companies turned to the ownership of the state. After four hundred years of Spanish and a half century of the American colonization, the country had an agrarian structure with deep deformations: a high presence of foreign capital, with the US companies owning more than one million hectares. There were large cane and livestock estates, the mono-exporting economy was mono-productive and had low use of the surface and poor living conditions of the peasantry and agricultural workers. All this, coupled with a poor preparation of human capital and few knowledge in the agricultural sector, further worsened the situation.

All these factors led to the necessary and unavoidable Agrarian Reform, which was already reflected in the political program of the Revolution, even many years before its triumph. With the First Agrarian Reform Act, approved right after the Revolution, the transformations of Cuban agriculture began to evolve. As a result of this first law, the state became the owner of 40% of the land across the country.

The Revolution, however, placed an enormous importance on industrialization and on the progress of science and technology. This has on one side led to a massive industrialization of the way in which most of the food was produced, and therefore on the dependency on the external production inputs. On the other side, this industrial and technology-led governmental

conviction helped Cuban researchers find a quick alternative once the industrial agricultural system was put in crisis and obtained the governmental support in the national transition to the organic agriculture.

The economic and military measures put in place by the American administration began immediately after the first revolutionary reforms were taken in Cuba, which have been deeply affecting the interests of the landowners- *latifundistas*. These measures forced the revolutionary state to enact in 1963 a second *Ley de Reforma Agraria* [2], which limited individual ownership to 67 hectares per person (Alvarez, 1994). In this way, Cubans became owners of 70% of the land and the figure of the state enterprise, as a distinctive feature of Cuban agriculture and a determinant of its ownership structure, was consolidated at that time.

This chapter will also focus on showing what place agriculture occupies in Cuba and for what political reasons certain policies have been put in place. Cuba's history is characterized by a long tradition agro-export crops grown under conditions of monoculture (Le Riverend, 1970; Moreno Fraginals, 1978; Marrero, 1974-1984, Funes, 2010). We will, therefore, figure out the reason behind this choice for the policy of monoculture. Moreover, an overview of the agricultural products that Cuba has been exporting and importing, will be provided.

Cuban organic revolution in its concrete form will be the main theme of the third part of this thesis. When trade relations with the socialist bloc collapsed in 1991, food imports declined by more than a half, the pesticides did more than 77%, and the availability of oil for agriculture by 50%. The agricultural system experienced a double challenge: the need to double food production while their inputs decreased by more than half, while maintaining export crops not to further deteriorate the desperate situation of the balance of international payments in the country.

Having said this, Cuba is a master of transforming necessity into opportunity, as was the case of the Organic Revolution with its numerous economic social and environmental benefits. Cuba of today is recognized for the largest conversion of the land farming methods that took place in history, from conventional agriculture, intensive in chemicals, to a model based on organic materials.

[2] Agrarian Reform Law (free translation)

Fernando Funes Monzote is considered to be the initiator of the organic farming and agro-ecologic movement and his research inspired our third chapter thanks to his radical vision of Cuban agriculture.

To give an illustration of the Cuban agricultural success, apart from demonstrating the ineffectiveness of the industrial farming, we will analyze the concrete stages of this organic transition.

Firstly, Cuba experienced an important change of direction in the field of science: following the outbreak of the food shortage, the Cuban government asked its scientists that represent 11% of the scientists of the whole Latin America, to come up with technological innovations[3]. To that end, the Government emphasized the training of human resources in order to create a large number of scientists and researchers aiming to produce innovative ideas and knowledge-intensive solutions to face the food crisis.

Secondly, the following measures were put in place, aiming concretely at the organic conversion:

- agrarian decentralization
- land redistribution to farmers (through the introduction of the law of *usufructo*)
- agroecology (Funes, 2012)

One of the most important features to be analyzed is the creation of cooperatives in the context of the planned economy, following the dissolution of the USSR. *Cooperativas de Créditos y Servicios,* Cooperatives of Credits and Services (CCS), whose members, peasants, maintain individual ownership of land, but are bound to pay for certain services and make transactions as loans and others. Today, there are around 2203 of these cooperatives in Cuba, with more than 150,000 members (Funes, 2010) and they are considered to be the foundation for the organic, farmer-led revolution in Cuba.

[3] Even though the total population of Cuba represents only 2% of the whole population of the Latin America, they contribute with more than 11% of Latin American scientists.

Similarly, by understanding which areas were the most suitable and prosperous ones, small farmers started to develop them by occupying a piece of land that originally belonged to the State, but since the imposition in 1992 of the law of usufruct, these spaces could be exploited by an individual. These land spaces were called *organopónicos* and one of their characteristics is the that they are surrounded by buildings and therefore, represent a perfect example of *urban gardening*. Indeed, most of the agriculture in Cuba is uniquely urban.

The last, fourth chapter deals with the discourse of sustainability, not only as a part of the current agenda of international development, but as one of the dimensions and challenges of the agricultural world. Organic production is not only interested in the final product that reaches the consumer, but aims to reach a more elevated, global objective.

Sustainable development was defined by the Brundtland Commission- World Commission on Environment and Development in 1987 as "development which meets the needs of current generations without compromising the ability of future generations to meet their own needs". And agriculture has always been present in the discourse on sustainable development and in the theories of development (Van Bilzen, 2015). The food issue at a global level was already introduced in 1972 in a famous report by the Club of Rome, *The limits to growth*. This controversial, but important report reminded of some significant limitations in terms of the unstoppable growth that the Earth was going towards. Among other things, it stated that it would be impossible for the population, food production, industrialization, the exploitation of natural resources and pollution of the environment to continue to experience exponential growth without sooner or later collapsing (Colombo, 2000).

By putting in place organic farming methods, Cuba has accomplished substantial steps towards sustainable development. Organic farming used to be a fashion trend in the past . Today it is developing from a theoretical concept to a fully established practice. Farmers reduce their dependence on externally produced agrochemical inputs and the whole system of agricultural production is redesigned (Funes in Gliessman, Stephen R., and Rosemeyer M., 2009).

As Fernando Funes brilliantly put it, "an increased awareness of the benefits of organic farming completed with a deeper understanding of the detrimental environmental impact of conventional farming practices resulted in an increased demand for organic food worldwide" (Gliessman, Stephen R., and Rosemeyer M., 2009).

In Cuba, the organic revolution was not only a change in terms of policies, but also and most importantly, a change of approach- *from rural to urban*. The Cuban case does not only represent a change of the model of production, but a beginning of the use of another space that puts a question mark above the *rural* space being previously used for agricultural purposes, and introducing the urban space into the agricultural reality. It did not represent an isolated movement, but a massive one with a wide popular participation.

Within this context, the theoretical concepts of urban agriculture and urban gardening will be considered for our research purposes. Cuban organic urban gardening is gaining attention far from its shores. Apart from being an innovative change of model, the Cuban green revolution represents the beginning of putting into practice of a new agricultural space that calls into question the *rural* space being previously used for agricultural purposes. In other words, organic agriculture introduces the urban space into the agricultural reality and puts emphasis on its sustainability. Therefore, one of the questions underlining this chapter will be whether Cuba is becoming urban, like other developing countries, or whether it is still prevalently rural.

The analysis of Cuban food system coupled with the discourse on sustainability will be enriched with the concepts of food sovereignty and food security, as well as environmental protection, which are complementary to our research. To this end, it is necessary to acknowledge that the Cuban government adopted a supportive stance towards the tendency to sustainability.

As far as Cuba's geographical and biophysical background is concerned, it is the biggest island of the Caribbean Ocean. It covers an overall area of 110,860 km2, dominated by expansive plains and three well-defined mountain ranges (Funes, 2012).

Cuba may even be considered a micro-continent, owing to the highly diverse nature to its landscape diversity, soil types, biodiversity, geological ages and microclimates (Glean, 2005). The island is composed of 49 well-defined natural regions, each with different characteristics of vegetation, climate and landscape (Funes in Gliessman and Rosemeyer , 2009).

Cuba is also known for the heterogeneity of its soil. Their fertility is not very high, though. However, in spite of some limitations relative to the characteristics of its soils, its natural setting is very appropriate for agricultural activities, as Fernando Funes put it: "Cuba

possesses an exceptional natural environment for agriculture. Due to its continuous growing season and diversity of plants and animals used for agricultural purposes, crop cultivation and raising animals in open air are possible throughout the year" (Funes, 2009).

Economically, it is currently designated as an upper-middle income country[4], but I would rather put this fact into question since the economic indicators such as the GNI per capita or GDP are left blank in many recognized scientific databases.[5]

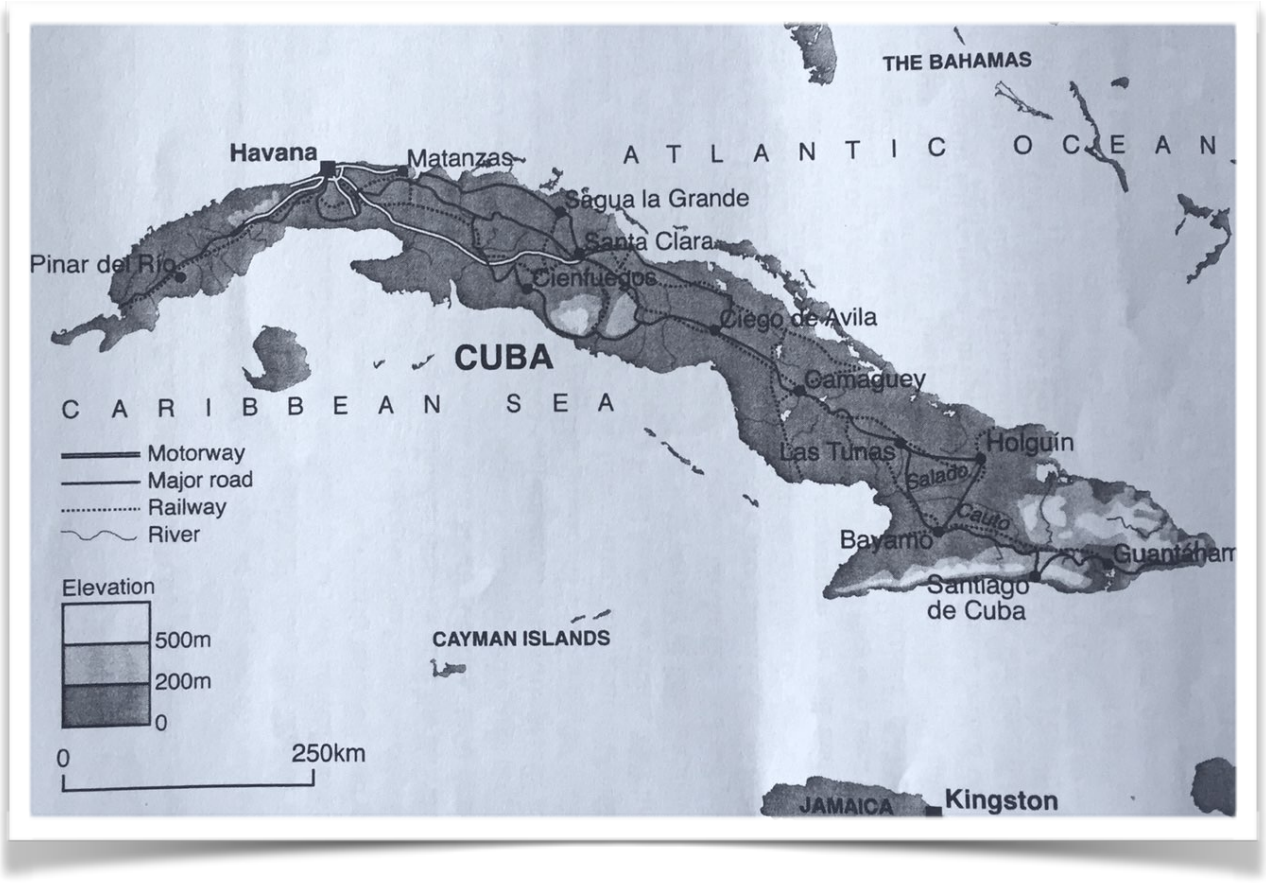

Figure 1: Map of Cuba. Source: Wright, Julia. Sustainable agriculture and food security in an era of oil scarcity: lessons from Cuba. Routledge, (2012).

Of the total of its 11,061,886 inhabitants (estimated in a national census in 2013), 23 % is still rural (World Bank, 2013). In 2012, 75% of its population was urbanized (UNICEF, 2013) which demonstrates a strong move towards the trend of urbanization, as in the majority of the developing world, but there is still significant space to be attributed to rural- based

[4] In the report done by the Rural Poverty Portal.
[5] This is the case of World Bank and UNICEF databases.

activities on the island. Agriculture represents an important income source and 19% of Cuban labor force is employed in the agricultural sector.

As emerges out of Figure 1, Cuba is proud of its strategic placement between the Two Americas which has contributed to the existence of significant commercial exchanges.

There is definitely a need to recognize the efforts that Cuba as a developing country is doing. In view of the still lasting economic embargo imposed by the United States, food is being used as a weapon of economic and political pressure, as well as a way of diplomatic promotion for the island. Cuba has been putting in place several long-term state policies to accomplish with the policy of the right to food for its population and investing many efforts into a significant Agrarian Reform that supports small and medium-sized farmers and mobilizes the whole society. Compelling evidence is mounting that alternative farming approaches can outperform industrialized farming in many circumstances (Wright 2012; Pretty, 1998; Parrott and Marsden, 2002; IFAD, 2003; Scialabba and Hattam, 2002). All things considered, there are some significant lessons that Cuba can teach to other countries. Scholars recognize that the experiences of Cuba with the rapid demise of the Socialist Block and thereby its source of food and fuel supplies ought to provide a valuable example for other nations vulnerable to similar predicaments(Wright, 2012).

I. Post-Revolutionary Cuban History and the Roots of the Food Issue

Cuba created the largest program in sustainable and urban agriculture ever undertaken. After the Revolution of 1959, Cuban State underwent through some major structural changes, in order to be adapted to the ideas of the Revolution.

Indeed, as Peter Rosset (2011) put it, the Cuban economy in the period from the Revolution until the collapse of the former Socialist block was characterized by the following features:

- high degree of technologic modernization
- social equity and welfare state
- significant external dependency

It is specifically this last characteristic, Cuban external dependency, which opens up the question of the economic dependence on the imported Soviet petroleum. All the agricultural production inputs, like chemical fertilizers and industrial machines, on which its highly-mechanized agriculture was dependent were coming from the Soviet Union. The choice of importing these products from the USSR represented a constraint due to the economic limitations imposed by the US embargo. At the same time, this external dependency represented a fundamental input that lead to the research for an ecologic alternative in the country.

This chapter analyses the historical roots of the food issue in Cuba, which became critical after the dissolution of the USSR and tightening of the US economic embargo. The fascinating transformation that the Cuban agriculture went through started in a specific epoch of its history, referred through the land and widely recognized as Special Period- *Período Especial*. This long period of economic and, most importantly, food crisis is officially called "Special Period in Peace Time" and this term designates a self-imposed state of emergency which urged the need for sacrifices in living standards, including an acceptance of insufficient food supplies, in order to buy the country the time to build up its levels of self-sufficiency a d particularly to meet basic food requirements (Wright, 2012). It all began as a result of the embargo imposed on the Cuban state by the US since 1960 and reinforced in 1992 and, additionally, by the collapse of the Soviet Union in 1991. These two historic events represent the external forces that drove the transformation to sustainable agriculture in Cuba

and therefore they require a deeper understanding to open our research. In order to understand what the underlying constraints and conditions for the organic farming movement in Cuba were, one has to begin with the history of Cuban post-revolutionary period.

A. The Revolution of 1959 and the related structural changes

Right after having installed to power, the Revolutionary Government began dismantling the neocolonial political system. The majority of the repressive bodies were dissolved and the citizens were guaranteed almost the full exercise of their rights that were denied to them by the previous dictatorial regime of Fulgencio Batista. All the former public administration was cleaned and misappropriated assets were confiscated. The criminals of Batista's regime were tried and punished, flushed to the corrupt leadership of the labor movement and political parties who had served tyranny were dissolved.

Commander Fidel Castro was appointed to Prime Minister in February 1959 in order to accelerate measures to benefit the Cuban people: a general lowering of rents was approved, beaches, that used to be private, were made available for the enjoyment of the people, and companies that use to monopolize public services were prohibited.

A momentous milestone in this process was represented by the *Agrarian Reform Law*, adopted on 17 May 1959, which eliminated large estates owned by the *latifundos* and nationalized all the properties of more than 420 hectares in size. This measure, which aimed at eliminating one of the mainstays of neocolonial domination, provoked an angry response from the affected interests. The US government had made public its distaste for the triumph of the Revolution and after promoting a malicious press campaign, adopted a policy of systematic harassment against Cuba, encouraging and supporting anti-regime movements.
This permanent US hostility was embodied in a series of succeeding steps to destabilize the Cuban economy and isolate the country from the rest of the international community.

To this reality, the Revolution responded with a dynamic foreign policy that extended its relationships and agreements, political and commercial, with other countries, mainly with the countries from the Soviet bloc. This foreign policy measure was a sign of Castro's determination to break the traditional trade and political dependence on the USA.

In July 1960, after the removal of the Cuban sugar quota by the US government, Fidel Castro announced the nationalization of all US properties in Cuba. This measure was followed, a few months later, by the decision to nationalize companies, which had traded with the United States and to the oligarchic sectors, in other words, Cuban bourgeoisie. They all had surrendered to systematic maneuvers of disinvestment and economic sabotage.

But the American aggressions were not limited to the field of economy. While encouraging the creation of several counter-revolutionary organizations and insurgent bands in different regions of the country, which supplied the rebels with weapons and other goods, the Eisenhower administration decided to break relations with Cuba in January 1961 when he had started preparing a mercenary brigade with purpose of invading the island. The invasion would begin on April 17 by the Playa Giron, after a surprise bombing of the Cuban air bases. At the burial of the victims of this attack, Fidel Castro proclaimed the socialist character of the Revolution, which has already been perceived from the measures taken in the final months of 1960.

This lead to a serious international crisis in October 1962, when the installation of Soviet missiles on the island was discovered. Internationally, the United States managed to separate Cuba from the Organization of American States (OAS). Similarly, the majority of Latin American countries, with the exception of Mexico, broke political and commercial relations with Cuba. However, the Cuban Revolution strengthened its ties with the socialist bloc and Third World countries, participated in the formation of the Non-Aligned Movement and developed an active policy of solidarity with the national liberation movements and supported them.

Cuba resisted with tenancy to all kinds of armed aggressions and had also to survive to the harsh economic pressures. The United States had abolished all trade with the island and Cuba was thus deprived of vital supplies for agriculture and industry. But the active support of the Soviet Union and other socialist countries, made it possible for the Cuban national economy to keep working.

It is important to point out that amid these numerous remarkable economic and political difficulties, Cuba's newly installed regime ensured a very good health and education system to the population.

Firstly, it managed to decrease and almost eliminate the unemployment rate and guarantee to the population the satisfaction of their basic needs. Despite the exodus of professionals and technicians to the United States, particularly noticeable in the area of health, the creation of high-level, rural medical services allowed to bring medical care to the remotest corners of the country.

Secondly, as far as the educational system is concerned, a vast literacy campaign was put in place starting in 1961, which abolished the old scourge of illiteracy. Castro's Cuba managed to reach for the first time full national scholar coverage.

Moreover, an extensive scholarship program was directed at the needs of the entire population. The quality of life was enriched by extensive cultural television diffusions and through regular editions of brilliant literary works (Pérez-Stable, 1998).

Similarly, post-revolutionary Cuba influenced the spreading of sports, which encouraged a growing and prominent participation of Cuban athletes in international sports competitions.

The new political leadership was accompanied by a considerable popular support, which materialized in a well-structured Communist Party of Cuba in 1965, representing the highest instance of leadership of the Revolution.

In 1963 Castro adopted a strategy for economic development, taking into consideration the specificities of the Cuban economy. Most importantly, trade prospects with the USSR and other socialist countries were crucial for the Cuban agriculture. The new strategy proposed to produce 10 million tons of sugar for 1970 and received a denomination "harvest of the 10 million". This was certainly a formidable challenge, taking into account the organizational conditions, techniques and materials of the country. In facing this challenge there were serious distortions in the direction of economic processes, as well as the activity of revolutionary organizations, concentrated in the vast mobilization of workers imposed by the low technical level of sugarcane agriculture and disproportionate demographic structures. The failure of the "harvest of 10 million," would lead to a thorough review of that policy.

On 24 February 1976, a new Constitution is approved in a referendum by secret ballot. Not surprisingly, 95.7 percent of the population over 18 years approved the Constitution. The

most important innovation is represented by the creation of various bodies in which people's power was embedded; these were created through a process that is based on the election of district delegates, among the various candidates proposed by citizens in popular meetings by area of residence.

As far as the diplomatic profile of Cuba is concerned, during these years, the international position of Cuba strengthened. The restoration of diplomatic relations with Peru, Panama, Chile and other Latin American countries, broke the siege laid by the United States in the previous decade. Following the signing of trade agreements with the Soviet Union whose favorable terms of trade away from unequal international market practices, Cuba joins the Council for Mutual Economic Assistance (CMEA). In 1976, Cuban troops are sent to Africa at the request of the government of Angola, in order to help liberate the country from the South African intervention. Soon after, another Cuban contingent will participate in the defense of Ethiopia-Somali aggression. Further, the celebration in Havana of the 6th Summit of Non-Aligned Countries in 1979 shows the prestige gained by the Revolution.

After a brief period of detente in the early years of the presidential mandate of James Carter, Cuban-US relations deteriorate with the increased aggressiveness of US policy at the end of Carter's administration. With the accession to the US presidency of Ronald Reagan, actions against the Revolution increased even more. The US government created the misnamed Radio Martí and TV Martí, with the character of a broadcasting channel with an intensified espionage against Cuba. Moreover, military exercises and tests airstrikes were conducted in order to punish Cuba in the Commission on Human Rights of the UN. He puts on the table the possibility of a direct aggression.

Cuba responds with the improvement of the country's defense system and elaborates the concept of the "*Guerra de Todo el Pueblo*".[6] Its essence being that every Cuban had a place and a means in the struggle against a possible imperialist aggression. The preparation of the people in the Territorial Militia Troops, Brigades of Production and Defense Zone slowed the imperialist intentions of a direct aggression.

It was demonstrated that with the Revolution, Cuba, besides obtaining its independence and a rescue of its national dignity, discrimination against women and against

[6] War of all the People. (Free translation)

young people was diminished (Acosta et al., 1973). To this must be added the social achievements in the social sphere. However, the economic progress remains a relative concept. At one side, Cubans claim having improved the economic situation of the country, whereas the international opinion judges the economic performace of Cuba in the years following the Revolution as almost satisfactory (Eckstein, 1997).

The period between 1980-1985 continues to be characterized by progress and significant achievements in the social sphere, with the main accent put on education and health care, despite the systematic increase of the American hostility and adverse climate conditions. However, since 1985, it has become evident that certain deficiencies and negative trends, primarily related to the application of the system of centralistic management and planning, were unsurmountable.

In April 1986, Fidel Castro raised the issue of a need to initiate a process of rectification of errors and of some negative tendencies that started to create problems and deforming vital Cuban principles, such as the unity between the economic and social development, the rescue of historical values, application of Marti's thought. He aimed at a more creative application Marxism-Leninism. Notwithstanding the evident shortcomings and inadequacies of this ideology and the need to improve the work of socialist construction, the Cuban people had attained truly impressive conquest.

B. US economic sanctions on Cuba, past and present

With the triumph of the Revolution on January 1959 starts a completely new stage of the relationship between Cuba and the US, which reached its peak on that led to the severance of diplomatic and consular relations, on January 3, 1961.
During this period, tensions between the two countries were accrued to the extent that popular measures were enacted by the revolutionary government, which broke with the established power structure since the beginning of the neocolonial Republic on May 20, 1902.

The first Agrarian Reform Law of May 17, 1959, aimed at expropriating large estates, banned foreign land ownership and gave ownership of it to those who worked and socialized cultivable areas. This led to a widening of the political and ideological differences between the two states. This law was followed by Law No. 851 of July 6, 1960 that established the

form of compensating the value of the properties of natural or legal persons who are nationals of the United States that were nationalized.

It is necessary to have a look at the Cuban constitutional evolution in order to understand the way in which it allowed to enact the changes by the government since the triumph of the Revolution:

1. Cuban Constitution and the impetus for the embargo

The constitutional development of Cuba begins with the constitution of 1901. This fundamental law was built on the example of the American model and was applied until 1928, when a reform allowed for the extension of the mandate of President General Gerardo Machado, who established soon a strict dictatorship. The fall of Machado on 12 August 1933, inaugurated a troubled and unstable period. As a result of a series of disorders in 1933, Fulgencio Batista begins his rise in power. He became Chief of the Army for the moment and moved the presidency to the Colonel Carlos Mendietta. Batista later interrupts the legal process by taking power on March 10, 1952. However, his dictatorship is overthrown by the *revolution of the "barbudos"*, led by Fidel Castro and Ernesto Guevara, said Che on the night of 31 December 1958.

A fundamental law of the Republic of Cuba was promulgated on 7 February 1959. This Constitution instals the power in the hands of the Council of Ministers, main state body. It had legislative and constitutive power and decided about appointment of the President of the Republic.From this moment on, the political power is concentrated in the hands of the leaders of the revolution, and particularly in Fidel Castro's hands. Castro, previously defense minister, became first Cuban Prime Minister by the decree of 16 February 1959. The Presidency was exercised by Manuel Urrutia, and after his resignation by Osvaldo Dorticos Torrado. The strongly nationalist revolution opted for communism in 1961.

Since the promulgation of the Basic Law of the Cuban Republic of February 1959, Cuba began a process of confiscation and nationalization of the properties of Cubans, Americans and other foreigners in the Island. The Law 851 of 6 July 1960 authorized the Cuban government to nationalize all the properties of US citizens, provided that the payment of such expropriations will be executed through 30-year bonds yielding an interest of 2%. This bonds would have been funded by the profits of sugar sales that Cuba would obtain the

in the United States market, at a condition that these would be superior to 3 million tons and not less than 5.75 cents per pound. However, the mechanism established by this law proved illusory because the United States reduced and then canceled the Cuban sugar quota in 1960.

The United States used the terms "seizure" and "confiscation" following the application of the Law 851 on the US properties and opened a series of legal cases against Cuba. Usually, the term seizure is used in the laws and regulations of the United States relative to the process of nationalization in Cuba. However, Cuba has insisted that the US property on the island were expropriated, not confiscated.

The Law 851 states:

"Whereas the attitude assumed by the Government and the legislative power of the United States of America of constant aggression for political purposes against the fundamental interest of the Cuban economy, emphatically evidenced by the amendment recently passed by the Congress of said country to the Sugar Act at the request of the executive power, by which the President of that nation is granted exceptional powers to reduce the participation of Cuban sugar in the sugar market of that country, as an arm of political action against Cuba, obliges the Revolutionary Government, to adopt without hesitation, also the measures that it may deem pertinent for the defense of the national sovereignty and the free economic development of our country." (Gaceta oficial de Cuba, 7 July 1960)

The wording of the Law 851 is fundamental for the understanding of what were the reasons that triggered the enacting of the embargo and confirms that the in the eyes of Cuban administration this was perceived as a sort of political arm and aggression. The enacting of the embargo in 1960 and its tightening in 1962 represented therefore a reaction to the steps undertaken by the Cuban Revolutionary administration.

In Cuba, the construction of a purely socialist society went on until the 1970s, with the main emphasis put on the economic sphere and the social organization. Most importantly, the main reforms in the Cuban economy were:

- Reform of agriculture
- Central planning
- Redirection of external commerce

All these three elements are central for the understanding of our research question. First of all, the evolution of the Cuban constitutional process helps us understand when and how the Cuban State opted for communism and how these ideas got integrated constitutionally.

Most importantly, this development demonstrates that the agricultural reform was one of the first and main steps underwent in order to put in place the revolutionary ideas. Secondly, it shows the importance that the agricultural sector occupied since the beginning in Cuban economy. Moreover, the idea of central planning gives an illustration about how the agricultural production from this moment on would be organized. Finally, the redirection of the commercial activities is related to the historic changes analyzed in this chapter, mainly the US embargo which constrained Cubans to look for an alternative trading partner.

A number of constitutional amendments, enacted with a new electoral law, intervene in the early 90s. Following a series of discussions organized on the reform of the Constitution in 1991, the changes are approved by the *Asamblea Nacional del Poder Popular* in 1992. The revised text is a continuation of the Revolution, both in the ideological aspect and in the organization of power. Two ideologies permeate, strongly and explicitly, the Cuban Constitution: Marxism-Leninism and Martisme. Indeed, with this Constitution, the cult to José Martí becomes essential next to the reference to Marx, Engels and Lenin, more than ever. The constitutional text of 1976 made of the unity of power and democratic centralism two essential principles of the Cuban socialist democracy. The supreme body, responsible to express the sovereign will of the Cuban people, is represented by the A*samblea Nacional del Poder Popular*- National Assembly of People's Power (ANPP). In practice, this supremacy is exercised largely by the State Council, presided by the Chief of the State.

Regarding the economy, the Constitution takes into account the context of sustainable development and emphasizes the duty of the State and its citizens to protect the environment and the country's natural resources. (Cuban Constitution, art 27).

Among the main characteristics of Cuba immediately before the economic embargo was enacted, we can mention:

- A complete economic dependence from the United States, which controlled the key export sugar industry (including 1,200,000 hectares that contained 25% of the best

agricultural land), electricity, part of the dairy industry, fueling and, in a significant measure, banks.

- The predominance of agricultural sector within the industry and sugar as the main export crop
- An economy, dominated by the properties of *latifundos* and huge foreign companies, with 114 large landowners controlling 20% of the land used for agricultural puroses, while a huge peasant masses lived in poverty, burdened by intermediaries, without credit, with ruinous prices.

2. US embargo

El bloqueo, the economic blockade was first imposed on 19 October 1960 after the revolutionary victory of Fidel Castro with the movement of 26th of July over the dictatorship of Fulgencio Batista, following a massive nationalization and expropriations of the properties owned by American citizens residing on the Cuban soil. Among these, huge oil corporations were nationalized, without reparation for their owners. In the period preceding the revolution, most of Cuban industry and financial system was dominated by US-lead companies (Roca, 1987).

As a consequence, President Dwight D. Eisenhower interrupted imports of Cuban sugar to the US by canceling most of Cuban sugar quota, which before 1960 represented for the Cuban economy 3 million of tons per year, ergo half of its sugar crop (Chicago Daily Tribune, 1960). Cuban economy in the pre-revolutionary period was characterized by its one-crop orientation to the sugar cane (Cuban study program, 1988). The issue of the sale of Cuban sugar to the United States represented the main fuel of island's economic growth since the signature of the Treaty of Paris in 1989, establishing a start of a commercial partnership between the two countries, facilitated by the geographical proximity. It is evident how seriously the loss of this economic variable impacted country's performance in financial terms.

Moreover, exports of the American oil to Cuba were suspended, abandoning the island to the resources it has been receiving from the Soviet block. The latter became Cuba's main diplomatic and commercial partner and its savior until the end of the Cold War.

Following the signature of a commercial accord between USSR and Cuba already in February 1960, US interrupted diplomatic relations by closing the American embassy in Havana and manifesting the official opposition to Castro's anti- American regime. After the unsuccessful invasion of America-trained Cuban exiles on the Bay of pigs in 1961 and a consecutive missile crisis following the American discovery of the Soviet missiles installed on the Cuban soil in October 1962, Cold War is at its peak. The relations between Cuba and the US kept deteriorating since then.

In 1963 President John F. Kennedy invoked Trading with the Enemy Act, already enacted in 1917, this law giving right to the US President to interrupt any commercial relations with American enemies during times of war. The scope of this historic law was extended to situations of national emergency giving a legal basis to the US government for imposing full economic sanctions on the island (Penalver-Garcia, 2010) and freezing all Cuban assets in the US (Cosic, 2010). All the steps taken by the American administration in respect to Cuban regime were aiming at its destabilization and overthrow. Even though not all its goals were achieved, US foreign policy towards Cuba enjoyed certain success in terms of economic damage caused to the island (Aronson et al.,1999).

In 1977 during Jimmy Carter's presidency, some restrictions are eased. A fishing agreement is debated with Cuba and travel abolition of Americans to Cuba is loosen. Diplomatic interest sections are open both in Havana and Washington and discussion is initiated on a variety of issues (Cosic, 2010). In the following year, remittances are allowed to be sent from USA to the familiars in Cuba, up to an amount of 500$ per quarter, a number which has been increased up to 2000$ per quarter only in 2009. Massive exodus of Cubans to American coasts continues during the Mariel boat lift, surging to historic figures reaching 600 000 Cuban immigrants in the US in 1980 (US Census Bureau, 2006).

President Ronald Reagan assumed the office in 1981 and decided to tighten the economic embargo and to suspend some existing migration accords between Cuba and the US. Policies put in place by the Castrist regime were held contrary to the US values and therefore enjoying whichever economic benefit from the United States was considered unacceptable. Castro, however, exploited this economic isolation and designation as an enemy, for the purpose of promoting and strengthening national unity. By underlining the destructive effects of American foreign policy in commercial terms, he mobilized Cuban people for domestic support.

National sovereignty and dignity of Cuban people , as the only nation being able to withstand American imperialist influence, were, and continue to be today, the main values of Cuban Revolution. How these values were being transmitted and reinforced has represented another reason for concern for the American administration. The denial of democratic principles and the delicate issue of human rights have since the outset of the revolution shaken American conscience. This moral disagreement kept in being manifested in the most diversified ways.

In 1982 traveling for tourist and business purposes to Cuba is banned again and in 1983 Radio Marti starts broadcasting from the US with the objective to divulge anti-Castro information. The companies that were trading with Cuba and evading trade embargo were punished and the US limited trade with foreign companies having commercial relations with Cuba.

Cuba's external debt kept raising, and in 1986 Cuba had to declare a default of over 10,8 billion $ to Paris Club of wealthy creditor nations being unable to repay it back. This debt amounts today at around 24 billion $ (CIA data, 2014).

As expected, the stateless groups in Miami, annoyed with the reality of Cuban resistance, increased their actions to defame and destabilize the Revolution and further intensify the economic blockade. Thus, in mid-1992, the US government approved the *Cuban Democracy Act,* referred to as well as *Ley Torricelli,* according to the name of the Congressman who initiated it. This act, among other things, gives the US president the power to impose economic sanctions on countries that maintain trade relations with Cuba and prohibits trading subsidiaries of American companies , based in third countries, with the island. This law was a step in the attempt to defeat the Cuban people through hunger.

In 1992, the blockage was extended to food and medicine, becoming almost all-comprehending and acquiring an official legal status through This act was passed during Bill Clinton' s presidency and aimed " at promoting a peaceful transition to democracy in Cuba through the application of sanctions directed at the Castro government and support for the Cuban people" (Cuban Democracy Act, 1992, 1). However, despite the Torricelli Act, Cuba expands its markets and gets some financing for specific economic activities and enterprises of various Soviet nations begin to invest and establish economic ties with the country.

However, the US anti-Cuban groups resorted again to attempt to generate internal subversion, terrorist acts, sabotage, provocation, infiltration of CIA agents and intensification of propaganda against Cuba. More than a thousand hours of radio head towards the island. These groups also prioritized the stimulation of illegal emigration, preferably by stealing boats and even airplanes. Given these facts, the Cuban government decided to prevent illegal departures, by forcing the US administration to sit at the negotiating table and sign on 9 September 1994 an immigration agreement with Cuba. After 36 years, the United States was facing the need to take steps to discourage illegal immigration into the country.

The embargo was further strengthened by the introduction of the Cuban Liberty and Democratic Solidarity (Libertad) Act of 1996: Helms–Burton Act, including the extraterritorial implications to the embargo by preventing foreign companies from trading with Cuba. This act gave US national and corporations the right to appeal against foreign companies doing business with proprieties nationalized during and after the Revolution (Penalver-Garcia, 2010). International isolation of Cuba had already steady roots, both political and economic.

For the Cuban side, this Act provides for a total, absolute and international economic blockade. It also seeks to prevent foreign investment and cutting all types of financing and supplies from outside the country. It establishes sanctions against companies and businessmen to maintain economic relations with Cuba. In addition, it legalizes US support to counterrevolutionary groups on the island. Cubans think that this law aimed at starving the Cuban people. However, despite the negative effects generated by this law, Cuba managed to maintain the health-, education system and social security for which it became world famous.

Cuba has been struggling for the removal of the economic sanctions that are causing major economic consequences to the country since their imposition. During the annual presentation of country's report regarding the US sanctions at the General Assembly of the UN, Abelardo Moreno, Cuban Deputy Foreign Minister, specified that the cost of *bloqueo* since its imposition, and taking into account the depreciation of the dollar against gold, costed Cuba around 117 million $[7] :

7 General Assembly of the United Nations Report : Necessity of ending the economic, commercial and financial embargo imposed by the United States of America against Cuba.
http://www.un.org/en/ga/62/plenary/cuba/bkg.shtml

"A precios corrientes, durante todos estos años, el bloqueo ha provocado perjuicios por más de 116 880 millones de dólares" (Granma, 2014) [8]

However, the lifting of the embargo is not a straightforward issue. The very particular decision-making process typical to the US has made a rule of the fragmentation of sovereignty and multiple separation of powers (Fabbrini, 2007). The institutional device of checks and balances makes sure that the Presidential decisions by the House of Representative and the Senate and vice versa. Given that the legislation that rules over the economic sanction on Cuba is strictly dependent on the Congress, the President of the US has today very little power in influencing the decision on the removal of embargo, unless it keeps being controlled by the opposition.

C. Collapse of the Soviet Union and outset of the Special Period

At the moment when Cuba was immersed in the development and refinement of the Revolutionary work, putting in place all the structural reforms, it is suddenly faced with the collapse of the socialist camp and the disintegration of the USSR.

Prior to the Soviet dissolution, evidence has demonstrated that Cuba has achieved a relatively high level of modernization, with an exemplary education system, good nutrition levels and a sanitary system ranked very high ,in Latin America and in the world, for the number of doctors per capita (Rosset, 2005).

The immediate effects of the fall of the Soviet Union were the loss of Eastern European markets and economic ties that were forged within the COMECON, shortage of food supplies, technologies and inputs and a reduced or eliminated level of external funding.

1. Cuban external dependency

I would define the Cuban external economic dependence first on the USA, then on the USSR, as the inability to satisfy independently its own needs in terms capital, technology, energy, manufacturing, food and other goods without having to resort to the international

[8] "At current prices, during all these years, the blockade has caused damages corresponding to more than 116 880 million dollars" (free translation)

economic system. However, this is a relative concept, given that in today's world characterized by a deep interdependency, no country, developed or not, can satisfy self-sufficiently its own needs. Nonetheless, the higher the degree of independence, the less vulnerable is a country to the influence of another country or international economic system. A country that depends a lot on another country to meet its basic economic needs, runs a risk of falling under the economic and political influence of the providing country.

However, this interpretation of Cuban external economic dependence is not to be confused with the postulates of the so-called Theory of the Dependency, which tries to explain the underdevelopment in Latin America based on the concept of dependency. Most of the ideologues of dependence theory divide the world according to the following dichotomy: developed, central, dominant or not dependent countries; and developing countries, peripheral, dominated or dependent. The international capitalist system produces both types of economies, one fed by the other, they keep the situation asymmetric. Moreover, economic growth or decline of the depending country is a result, first of all, of international forces over which national agents have little or no control. The dominant countries produce mainly capital and manufactured goods and export them to the dependent countries, which, in turn, provide the very much-needed raw materials.

This trend is prolonged by the increasing or declining commodity prices, as well as the increases in the price of capital goods, which have resulted in a deterioration of the terms of trade for dependent countries. Therefore, an economic surplus is transferred from the dependent to the dominant countries through trade as well as through capital repayments (Gardozo and Paletto, 1979).

During the times of Cold War, Cuba was exchanging goods with the Soviet block at favorable terms of trade. This fact was essentially a constraint due to the imposition of the US embargo , while, on the other hand, opening possibilities of a rapid development for the island compared to the rest of Latin America (Rosset ,2005).

Cuban external dependence relied mainly on the following mechanisms, namely:

- global dependence on trade
- predominance of sugar exports
- dependence on imports, and composition of these

- terms of trade
- concentration of commercial relations
- foreign energy dependence (Ritter, 1974)

Considering the first aspect, the dependence of a country on trade, it becomes straightforward that the more a country relies on the foreign trade to obtain goods and services that are not produced domestically, and while greater and more dominant is the export sector, the more vulnerable can be made that country's economy against the external forces. Cuba, a monocultural economy, has traditionally concentrated its efforts to produce a few items for export and has produced very few of the items to be consumed by its own population. Consequently, foreign trade has been essential to the economy of the island.

Secondly, Cuba has always been greatly dependent on sugar as a major source of exports and foreign exchange. This concentration of exports makes the economy more vulnerable to price fluctuations in the international markets, than if a country has a more diversified exportations. From the 1920s until 1950s, the proportion of sugar exports out of the total exports fluctuated between 70 % and 90%, with an overall average of 82% . From 1959 to 1976, the proportion of sugar oscillated between 75% and 92%, with an average 85%, slightly above the pre-revolutionary average. Moreover, nickel exports have increased and have replaced the tobacco as the second main export of Cuba, and there have also been slight increases in the proportions of the fish and citrus fruit exports (Baklanoff, 1971). Anyway, the combined total export, except sugar, reached 18% in 1959-1976, which shows the low diversity typical to the composition of Cuban exports (Blasier and Mesa-Lago, 1979).

As far as the dependence on the imports is concerned, the relationship is as follows: the more a country imports the articles of basic daily use for the people, rather than produce them internally, the more dependent will the country be. The composition of imports is also important: a high percentage of manufactures indicates the creation of a continuous dependence, while a high proportion of capital goods points out a process of import substitution, which can lead the country to be able to produce consumer goods internally, and thus reduce dependence. However, it has to be underlined that what Cuba was importing from the Soviet Union was often not listed in its foreign trade statistics.

Food continues to occupy the highest proportion of imports. The remaining 40% of imports were machinery and transport equipment, mostly related part two the sugar sector

(21% in 1963-1975, compared with 19% in 1959), fuel (9%) chemicals, especially related to agriculture (6% and 9 '%, respectively) and raw materials (a constant figure of 4%) (Baklanoff, 1971).

The most interesting aspect of the Cuban external dependency on the USSR is represented definitely by the terms of trade on which the two countries based their exchanges. The exchange ratio measures the amount of imports that a country can obtain for a unit of its exports. A deterioration in the terms of trade means that a country can buy fewer units of imports with one unit of exports - while improving the terms of trade means the opposite. For nearly two decades, Western experts in international trade have examined the question of whether the Soviet Union has taken advantage of the socialist countries with which it trades, exporting to those countries at higher prices and buying at lower prices than the prices prevailing in transactions that the Soviet trade was executing with the countries of market economy. Most of the acquired information indicates that this has really happened, although such a comparison does not include Cuba.

In 1960-1978, the exchange relationship with the Soviet Union Cuba was based on a more favorable terms of trade than with other socialist countries, because the Soviet Union granted substantial subsidies to most of the Cuban exports (sugar, nickel) and Cuban oil imports, which were not applied to the other COMECON countries. Cuba was also benefiting from its exports to the Soviet Union, more that market economies. On average, the Soviet Union paid a higher price for Cuban sugar and nickel, which together accounted for 90% of exports from Cuba, that the average world price.

In 1973-1978, Cuba bought oil from the Soviet Union at a price below the world price, but this gain may have been counterbalanced by higher price, than the world market price, that Cuba paid for the capital goods, intermediate and manufactured, that Cuba imported from the Soviet Union.

Since 1976, the price of basic exports of Cuba has been linked to the prices of oil, steel, machinery, food and other imports "basic" from the Soviet Union, with which the terms of trade between the two countries has improved. Cuba's main economic expert, Carlos Rafael Rodriguez, has publicly stated that the socialist field lacks a range of technology that is available in the West.

The concentration of commercial relations demonstrates that if a country closely adheres to the business relationship with a single country, this implies a high degree of dependency, while a variety of business relationships make a country less vulnerable to economic and political influence. On average, the concentration of trade relations between Cuba has improved during the Revolution, since in 1946-1958 68% of their total trade was with the United States, and from 1961 to 1977, 53% was with the Soviet Union. But in 1978, total trade between Cuba and the Soviet Union reached the highest record of 69%, whereas only 10% of trade was with other countries of COMECON, namely German Democratic Republic, Czechoslovakia, Bulgaria, which were then under the Soviet sphere of influence.

The lowest percentages of the Cuban-Soviet trade (39% in 1964 and 40% in 1974) have occurred when sugar prices on the world market were high, which gave to Cuba sufficient opportunities to expand their ability to choose the countries with which to trade.(Perez-Lopez, 1979). Instead, when sugar prices in the international market were low, the Cuban-Soviet trade reached its highest levels: 57% in 1967, 63% in 1977 and 70% in 1978 (Perez-Lopez, 1979). Moreover, the Soviet Union supplied Cuba virtually all oil it required and most of the food and raw materials, whereas other socialist countries also provided a substantial proportion of food.

Finally, the dependency of foreign energy directed the Cuban external dependence since the global energy crisis of 1973. The Cuban dependence on foreign supply of energy resources has become a costly reality, this was true even for industrialized countries and much more for developing countries. The largest economies in the world have become vulnerable to economic and political influence of the Organization of Petroleum Exporting Countries (OPEC).

Given that Cuba is not well endowed with energy, it had to buy all the petroleum it needed for its economy from the Soviet block. However, Cuba apparently does not possess coal, its hydroelectric potential is very low, and the little deposits of oil and gas are very limited. Solar energy is a possibility, but Cuba lacks the technology to benefit from it, based on a relatively inexpensive large scale. Moreover, Cubans do not seem interested in gasohol production from sugar. In 1967-1978, the Soviet Union provided an average of 98% of Cuban oil imports, which put the island in seventh place among importers of Soviet oil. This oil comes from the Black Sea ports, located 6,500 miles away, and in 1972, petroleum was required every two days to keep Cuba properly supplied. What is more, Cuban administration

painfully recognized that a disruption in the supply of oil would paralyze the country almost immediately.

This comparison of the main mechanisms influencing the degree of the external dependence of Cuba shows little change between the pre-revolutionary degree of external economic dependence and the post- revolutionary degree one , with a number that worsened in the early 1970s. The overall trade dependence seems to have improved after the Revolution, but still the favorable terms of trade with the USSR did to come without costs. Cuban economy created an insuperable dependency on the products it was receiving or producing on the basis of petroleum received from the USSR.

Indeed, Prof. Peter Rosset, food analyst, agroecologist and rural development specialist, put it in clear terms:

"*Nevertheless, some of the same contradictions that modernization produced in other third world countries were apparent in Cuba, with Cuba's development model proving ultimately to be of the dependent type. Agriculture was defined by extensive mono-crop production of export crops and a heavy dependence on imported agrochemicals, hybrid seeds, machinery, and petroleum" (*Rosset P., 2005).

2. Special Period in Peace Time

In November 1989 the Berlin Wall falls and as a consequence, one after the other, the European fraternal socialist countries move to capitalism. These events touched dramatically the entire Cuban society, since the whole of the country's economy was integrated into the Socialist community. Such integration was conditioned further by the fierce blockade that the United States maintained on Cuba since the early years of the Revolution, and which limited extraordinarily the possibility of relations with the capitalist world.

In 1989, Cuba concentrated 85 percent of its trade relations with the USSR and with the rest of the socialist camp. In this exchange fair prices were established, avoiding unequal exchange characteristic of relations with developed capitalist countries. At the same time, the supply of technology and granting credit on satisfactory terms and interest rates were ensured.

The period 1989 - 1991 marks the beginning of catastrophic times for Cuba. Within months, Cuba lost its main trading partners and the entire production system is disturbed. Thus, a second blockade develops, given that the United States have severed ties with the island. With the collapse of the Soviet bloc, Cuba loses its main supplier of oil, farm equipment, chemical fertilizers and pesticides. The economic consequences are terrific. With the disappearance of the USSR and the former countries of the East, who bought its products at constant prices, the island also loses juicy markets, particularly sugar, of which it exported 85% of its production.

When the collapse of socialism in Europe occurred together with the disintegration of the USSR, all in a very short period, Cuba reduced its purchasing capacity of 8.139 million pesos in 1989 to 2,000 million in 1993 (Villanueva et al., 1994).

The fall of socialism in Eastern Europe and the USSR unleashed a great euphoria in the government of the United States and among the Cuban counterrevolutionary groups based in Miami. They predicted that the collapse of the Cuban Revolution was a matter of days or weeks. They came to make political efforts to the organization and integration of a new government. Few people in the world thought that the Cuban revolutionary project could survive, because it was located in a global environment increasingly dominated by the advance of neoliberal ideas and practices of capitalist expansion. The external conditions, which the Cuban economy was facing, comprised the advantageous treatment through economic and financial links mainly with the USSR. But the months passed, the crisis became worse, but in Cuba there was no decomposition.

For Cuba, it is the beginning of a new era, in other words of a "*Special Period in Peacetime*" announced in 1992 by Fidel Castro and will last five years, i.e. a period of severe economic crisis, with the GDP falling by 35%, foreign trade by 75% and the purchasing power of 50%. Most importantly, the population suffers from malnutrition. However, evidence has shown that since July 1989, Fidel Castro was warning about the possibility of the disappearance of the socialist camp and even about the disintegration of the USSR, and in October 1990, he started developing policies to address the Special Period. These policies comprised the above mentioned concept of the military doctrine of "War of All the People", referring to measures to address the total blockade, air strikes as well as a direct military invasion.

In 1991, the Fourth Congress of the Communist Party of Cuba took place. The newly created situation was analyzed and an emphasis is put on the accurate need to save the country, the Revolution and Socialism, i.e, all the work that cost much blood, sacrifice and effort to the Cuban people in over one hundred years of struggle. In this congress, a series of important agreements concerning amendments to the Constitution were taken, the statutes of the Party and the foundations of the strategy to resist and begin a recovery. With the revision of the Constitution in 1992, some major changes were introduced in order to face the critical period and motivate people by increasing their power of decision-making. Fro this moment on, representatives of the provincial councils and the National Assembly could be elected directly by the people. It also establishes *parlementos obreros* (parliaments of workers), to present the proposed economic measures and to discuss it in workplaces and in neighborhoods. In the strategy proposed, a series of measures were outlined, aimed at raising economic efficiency and competitiveness of the island given its previous total dependence on the Soviet economy. Moreover, internal financial system needed solutions to recover and practices of domestic borrowing were implemented. During these discussions, the green light was obtained for a series of economic reforms accelerating tourism development and creation of favorable conditions for foreign investors. Amon these, there was also a measure legalizing the possession of dollars for the Cuban people, until that time completely prohibited and sanctioned. Most importantly, the reform of agriculture was agreed.

On 29 August 1992 an official note published in the Cuban press was reporting to the Cubans about the need to start applying a set of restrictive measures in the field of fuel and electricity, as well as the shutdown of major investments. The note was informing about a series of emergency steps that the population would have to accept in order to face the shortfalls of fuel and food:

"como las afectaciones en los suministros que procedían de la URSS y otros países del Este de Europa no se limitan exclusivamente al combustible, frente a cada situación concreta se adoptarán e informarán a la población las decisiones que resulten pertinentes".[9]

[9] "As the effects on supplies coming from the USSR and other countries of Eastern Europe are not limited to fuel, the public will be informed as for each specific situation that will adopted and about the decisions that are relevant" (free translation)

Cuba started to plan a reintegration into the international economy and encouraging foreign capital investment. However, all this was implemented by strengthening the Cuban State enterprise, a necessary condition without which there could be no socialism. The need to expand and improve the economic situation was implemented gradually. In short, based on the preservation of the essential principles of social justice, the mechanisms of commodity-money relations and capitalist management was used to in a controlled manner to face the decline, revive the domestic economy and start a recovery.

In December 1991, together with the breakdown of the Soviet Bloc, the collapse of the trade relations between the two countries included also the cessation of subsidized petroleum deliveries (Cosic, 2010). This fact resulted in the outbreak of a national food crisis due to island's enormous financial dependence from the USSR. Following the Soviet dissolution, Cuba's GDP dropped by around 24 % in 1991 and 15% in 1992 (Penalver-Garcia, 2010). Cuban economy entered in a well-known period of its history- *Periodo Especial*- whose effects were immediate.

The term "Special Period" arises in Cuba already in the seventies, when the doctrine of war of all the people began to develop. It was referred to the strategic vision of the Revolution, the recent experiences of national events and main characteristics of the country. As a fundamental element of the military doctrine, the special period in time of war defines the system of defense, economic and political actions to do the country in case of armed aggression and total blockade of imperialism, to defend the socialist country with its own resources and be able to resist and defeat the enemy. When the Cuban nation faced a severe depression leading to a very peculiar crisis, fundamentally economic and with important social implications, this led in Cuba to the promotion of certain policy adjustments that would result in the end in what was called as Special Period in Times of Peace. This strategy would allow to first confront, later to survive and subsequently to obtain results that would mean a possible end of the crisis itself. Special Period in Times of Peace is referring a political-economic concept expressing willingness to combat the economic crisis with own effort and energy in the country to cope with the difficult circumstances and to find effective alternative solutions without having the abandon the principles of socialism. This period of food and economic crisis can be considered the result of a series of accumulated and aggravated situations between the seventies and the nineties of the twentieth century in Cuba, when the external dependence was created.

One of the main effects of the Special Period is a sharp drop in GDP and the mismatch of key macroeconomic and sectoral proportions. Given the drop in the economic support that had hitherto sustained the economic growth of the island, the system suffered an almost complete disarticulation. What became evident was a crisis, which manifested as a productive, food, financial and energy crisis. Moreover, a drastic drop in the sugar production was registered as well as a fall in the price of sugar at the world market.

3. Cuba faced with a national food issue

The 1990s are remembered in Cuba because of the shortages of food, medicine, clothing and most importantly, oil and transportation that Cuban people had to live through. The shortfall of these products has been reported by several scholars, visiting Cuba for research purposes (Wright, 2012).

The food crisis has been rooted in major deficits of imported oil and chemical supplies necessary for the vigorously industrial agriculture put in place by the Cuban state since the start of the Revolution. The agricultural system was paralyzed due to the shortfall of the fossil fuels on which it was depending. People were desperate as they lacked nutrients, proteins, medicine and transportation. Some remember the year 1994 as the toughest one where literally no food was available. Cubans increased their physical activity from 30% to 80% and decreased the daily caloric intake from 3,000 to 2,200 calories. An average Cuban lost 8 kilos of the body weight, their eating habits and physical activities suddenly changed. After 1996, the population experienced a weight gain of 9 kilos (a health study by BBC). It has been also demonstrated that this forced exercise and diet made decrease the mortality rate, particularly diabetes and cardiovascular diseases. In addition to a decrease in weight and incidence of diabetes and cardiovascular disease, Cuba had to face problems of malnutrition. Previous studies indicate that in those five years the diet of adults was less than 2,000 calories a day, while for children and elderly it was nearly 1,500 calories per day (Altieri et al., 2012).

Between 1989 and 1999, infant mortality decreased further from 11 ‰ to 6.4 ‰. Life expectancy raised from 74 to 75 years. The number of physicians evolved from 1 per 443 inhabitants to 1 per 175 inhabitants. Therefore, it can be deemed that no other country had lived through such profound and abrupt changes in its economic and political relations as Cuba did. Few companies were able to survive in such an economic catastrophe. On a

statistical basis, Cuba had to expect mass revolts and civil war, as was the case in Algeria in the 80s and in Albania, Russia and other Republics of Central Asia, in the 90s. This as a general rule for regimes faced with a serious economic collapse. Other regimes managed to keep their heads above water by the use of military repression, as was the case in Chile and Argentina. In Miami, right after the dissolution of the USSR the anti-Castro organizations were already speaking of the "democratic transition" after the fall of Fidel (Arboleya, 1994). But Cubans were not of the same opinion, they spend a very difficult time but the majority continues to support the government.

On the political scale, in 1994 illegal oversea migration to the United States accelerated significantly, following the food availability problems (Cosic, 2010).

The effects of this national food crisis were numerous. Apart from instigating an new economic dependence on Hugo Chavez' Venezuela, from which it was importing petroleum and to which it started to export its doctors, most importantly, the crisis has resulted in the need to start importing 80% of its food. However, these numbers are being denied by the major initiator and scholar of the Cuban organic transition- Fernando Funes- whose research demonstrates that the evidence on Cuban dependency on foreign food imports are exaggerated, if not erroneous. (Funes, 2012)

In the early 90s, most observers announced an abrupt end to the Cuban revolution (Azicri, 2004). Considering that Cuba had first lost the privileged trade relations with the United States and thirty years later, the same happened with the socialist countries, a severe economic crisis accompanied by an immense social regression was expected. However, this was not the case in Cuba.

The food shortfall of the 1990s did not come unobserved by the Cuban administration. Cuba chose an ecological alternative as a solution for the shortage of chemical agricultural production components.

This chapter has demonstrated that the rganic agriculture in Cuba can be interpreted as a way to recover from the Special Period. A switch from an industry- and chemistry-dependent food system to a system based on sustainable principles of production occurred. However, we have seen that this ecologic transition was not a free choice of Cuban farmers, but a constraint imposed by both external historic constraint and internal production inputs shortage. Nevertheless, the results of this project will later on prove to be an extraordinary

success, gaining international recognition for the island for what has been considered as the most developed method of food production in Cuba.

II. Agricultural Policy-Making and its Evolution in Cuba before and after the Revolution

In this part of the research, we will first analyze how states choose their agricultural policies, in a general perspective, in order to best satisfy the needs of their populations. Choosing an agricultural policy is dependent on the geographical situation of the country, on the challenges and demands of its market, on the state and availability of the technologies and most importantly, on the availability and access to natural resources of a country. In the developing world, the most challenging issues are represented by hunger and rural poverty and therefore require a prompt answer by national and international policymakers and cannot be just tackled at the technical level.

Agricultural sector is critical to the economic development, mainly for the following reasons:

- it increases the food supply for the domestic consumption
- it frees up the workforce to be employed in secondary and tertiary sectors
- it expands the market for products from industry and services
- it increases the availability of domestic savings to finance investments and to obtain foreign exchange (Alvarez and Gonzales, 2014).

In Cuba, most of these aspects were not effective in the period immediately after the Revolution of 1959, since the productivity of the agricultural sector did not reach its full potential because of the dependency on external production inputs. This external dependency was created in the period between 1902-1959, when the inflow of the capital from the USA contributed to a creation of and economy of monoculture, producing a single output for export, sugarcane. This mono-crop policy was established within a context dominated by large American estates, which contributed to worsen the inequality between rich and poor Cubans and between Cubans and Americans. Moreover, in this way, it also contributed to creating a dependency for Cuba on this single export crop which later led to its food vulnerability (Alvarez and Gonzales, 2014).

In this perspective, we will analyze the importance of concepts like food security and food sovereignty for the food issue in Cuba, within a general framework underlining the importance of pursuing a sustainable agricultural policy. Thanks to this extensive theoretical

framework of agricultural policy-making we will be able to interpret the evolution of agricultural policies in Cuba in the aftermath of 1959.

A. Choice of agricultural policies in the developed and developing countries

The ultimate objective of agriculture is to contribute to the economic and social development of a nation. In agriculture, as in other sectors, economic policy responds to national imperatives and social and political visions. It is designed to achieve corporate purposes that are not exclusively economic. Therefore, the basis of the strategy, or set of policies, should be the definition of social or corporate purposes, comprehensive for agriculture and rural areas. Fundamentally, it must be related to the promotion of human development. The specific objectives of the agricultural sector derive from this more general purpose.

Agricultural policy-making has been always characterized by emerging innovations and to them connected political and environmental controversies. As a general rule, a choice of an agricultural policy corresponds to a way in which an issue is presented. In other words, based on how an agricultural problem is conjugated, the agricultural policy of a state will follow. As Robert Paarlberg put it correctly, food and farming sectors of all states foster significant political activity. Rural and urban food producers require different policy inputs, have divergent short-term interests and they need to use the extensive powers of the State to obtain a benefit from their production activities. Among other things, they are interested in matters related to collecting taxes, providing of subsidies, managing exchange rates that influence the final prices of the commodities they sell, and other market-regulatory activities (Paarlberg, 2013). Therefore, he uses the term Food Politics to describe all the risk and gains associated to the state action and allocated to the food and farming sector.

In most countries, the ways in which agriculture can support human development are more effective: a) ensuring that nutrition and other basic material needs are met in rural areas, and b) indirectly contributing to the satisfaction of those needs in urban areas. In some economies in transition, nutrition levels are high enough, not to cause general concern, but they can meet other material needs ,given the frequency of rural poverty in those economies. In many developing countries poor nutrition is still significant in rural groups, although it is important to recognize that, for the world as a whole, the proportion of poor people has declined considerably over the past three decades (FAO, 2006).

In both developed and developing worlds, several factors influence the design of the agricultural policies. Important elements determining the agricultural activity include political and socio-economic factors that are related to the characteristics of a farm as an enterprise. Among these, the following need to be mentioned: tenure, land ownership, far size, marketing, transport costs, labor supply, ecological constraints and other variables associated with the character of the farm and the farmer (Robinson, 2004). Agriculture often appears as an activity that contributes to the production on a landscape to the extent that it arranges the space and the structure of a landscape. Agricultural landscapes can be addressed,in their physical dimensions, as the result of the functioning of a given agricultural system in space.

The question that now arises is, which subgoals, if they were achieved, would contribute to creating an agriculture that can better meet its overall objectives?

In many countries, for a long time, it has been a custom to define the increased production as the objective of the agricultural development strategy. Often this objective has been raised more specifically, as increased production of staple foods, usually grains and sometimes major tubers. However, although producing greater amounts of staple foods may be important, a physical goal of this nature is not enough to achieve the goal of human development or, even, the goal of raising the material well-being. Production alone is not necessarily the best indicator of the economic situation of rural households. Income is a better indicator because it takes into account the prices received by farmers and their production costs. Even more relevant is the real income, which adjusts net income with the inflation rate to measure the purchasing power of rural families.

Therefore, the most effective contribution of agriculture to food security and other basic material needs is to generate higher real incomes for rural households (FAO report, 2012). This contribution, in turn, depends on three factors: production in real estates prices, and non-agricultural employment in rural areas. Actual prices are almost always beyond the control of farmers, but can be influenced by policies. Production depends on the cultivated area and productivity or unit yields. In many countries, as the availability of arable land is exhausted, production increases depend increasingly on the technologies designed to improve productivity.

Generally, it is recognized that poorer countries choose their policies based on material interests whereas the richer ones decide considering some social values. In the former ones, most of the population is employed in the agricultural sector and they can hardly afford to buy any food. In the rich countries, instead, the number of farmers is diminishing and consumers can follow a more adequate diet, taking into account various preferences related to the quality and provenience of food. Having said that, there are mainly 4 approaches in the agricultural policy-making, all dependent on the geography of a given agriculture.

First of all the approaches has emerged the approach of traditional agriculture. This framework has evolved in the post-1945 context and has provided for a very extensive and general implementation of agricultural policies. Based on the location and context, it emphasizes the physical characteristics of the land in order to best determine which machines use to work the land. However, such an approach includes an extensive use of chemical machinery and is highly industrial.

Secondly, behavioral approaches add the personal characteristics of the farmers to the equations of agricultural policy-making. The resultant patterns of agricultural land use is viewed as a result of simultaneously intervening behavioral, economic and physical forces.

Thirdly, political economy approach to the agriculture advocates an emphasis on the social relations of the production and their determination of the nature of the land use. This framework was developed in the mid-1980s and has conjugated political and economic structures within one model. In this context, a farm is seen as a part of social relations of two kinds: the local and the global, with the latter increasingly assuming greater importance (Robinson, 2004). According to this approach, the main goal of a state is to maximize social welfare and therefore it determines some targets that it has to achieve, taking into account all the different constraints- state resources, land resources, administrative capacity, climate and side effects.

Modern approaches advocate the use of ecologic principles and are of organic and sustainable kind. Following the general overview of the objectives and models of agricultural policies, it is time to analyze the increasingly popular trend represented by the modern organic agriculture. Surprisingly, such a kind of production is easily imposed in different Latin American countries thanks to extensive efforts of peasant movements, whereas in the

developed world, such an agriculture is struggling to take the lead over the editorial techniques.

In addition to establishing the objectives and means according to a specific approach, the strategic framework of a policy should also take into account the principles conjugated by the political means. In other words, the policy objectives can not be pursued at any cost. The principles represent conditions or limits on the types of actions (means) used to try to achieve the strategic objectives.

B. Global Need of an Organic Food Production

One of the modern agricultural approaches that a growing number of countries is adopting today all over the world is the ecologic approach to the agricultural production. Following the backdrop of climate and environmental disasters in repetition, the food crisis of 2007-2008 finally shook the conscience of the international community in its belief in a happy globalization. Issues like pressure on land and resources, persistent hunger, worsening inequalities and exacerbating rural conflicts, destruction of ecosystems and exclusion of farmers out of the profits of globalization, make many people change their minds. Nonetheless, such issues are politically sensible and therefore their actual application in the agricultural policy-making depends on the political will and of the governmental constraints of the people in charge of the design and implementation of those policies.

The Green Revolution, sign of agricultural intensification in the 21st century, has proven not to be capable of producing a healthy alimentation that would cover the needs of the whole global population (Altieri and Nicholls, 2008). It has comprised a move from labor-intensive to capital-intensive farming, involving a direct transfer of technology from rich countries to poor ones (Robinson, 2004). These scientists have demonstrated that an industrial agricultural production has caused a series of irreparable harms to the natural environment and the health of human beings, through the use of highly chemical products, pesticides and chemical irrigation. Moreover, the dependence on the oil supplies of such food production systems is affected by the fluctuating prices of oil in the international markets.

Moreover, the absence of a mechanism of ecologic regulation in the field of the use of pesticides have made the monocultures highly dependent on the latter. The global consumption of the pesticides has significantly risen in the last five years, attaining today 2,6

millions of tons per year (Delcourt, 2014). Such a quantity corresponds to 25 billions of dollars per year. This shows how the use of pesticides becomes a matter of business, and not a means to attain a productive efficacy in the agricultural field.

Current global food production is creating a sufficient quantity of food, able to nourish 9-10 billions of people until 2015. However, a billion of people is still suffering from hunger today. The reasons of this problem are not to be searched in the absence of food, but in the poverty and inequalities. The crucial factor in terms of the world issue of hunger is therefore not the food production, but its distribution. Thus, it is necessary to guarantee for all the human beings the right to access the land, resources and support networks that would in the last place provide them a healthy alimentation. This is one of the Objectives of Sustainable Development of the United Nations. However, its translation to the concrete national agricultural polices is still an issue.

An alternative approach and model for agricultural development is being imposed in the 21st century to the developed nations, encouraging a more ecological, resilient and sustainable forms of food production, which are respectful for the natural environment and socially equitable. It has to be acknowledged that such an alternative is, at current prices, still very costly and politically sensitive. The five basic principles for a sustainable agricultural strategy in the long term are:

- Economic sustainability: A proper sustainable agricultural strategy must first of all find a way to ensure real economic benefits to the rural sector. Fiscal discipline remains important, meaning that it has to, among other things, not just simply put in place tax cuts. Such a sustainable strategy corresponds to the main objectives of agriculture and thus, the importance of agricultural development for the growth of the entire economy.

- Social sustainability: The strategy should also improve the economic welfare of low-income groups and other disadvantaged groups, including women. Otherwise it would lose its social viability.

- Fiscal sustainability: a sustainable agriculture should not pursue policies, programs and projects whose funding sources are not fully identified. In an era of increasing fiscal constraints in all countries, the application of this principle encourages the search for new

sources of revenue and ways by which the beneficiaries of the policies, programs and projects can contribute to their financing.

- Institutional sustainability: The institutions created or supported by sustainable agricultural policies should be robust and able to sustain themselves in the future. For example, only financial institutions that provide credit to farmers, without the ability to take deposits, are not likely to survive long. Similarly, research institutions and their sustained expansion mainly by international loans and grants are not sustainable in the long term.

- Environmental sustainability: A sustainable policy should promote sustainable management of forests and fisheries and reduce to manageable levels contamination of water sources and soil degradation. In some countries, a major challenge for agricultural policy is to slow or stop the spread of the "agricultural frontier" or areas where cultivation is possible only if trees are felled.

C. Cuban Agricultural Policy-Making

Surprisingly enough, unlike the isolated sustainable agriculture movements that are developing in most of the developed countries, Cuba has become famous for the development of a massive organic movement with wide, popular participation (Funes, 2009).

The agro-ecological food approach is being applied in Cuba on 46%-72% of its total food production (Altieri and Nicholls, 2008). The little farmers produce around 70% of the national agricultural production - 77% of root vegetables, 94% of small livestock farming, 73% of rice and 80% of fruits. Moreover, the majority of honey, cocoa, corn and milk is also produced following organic principles (Funes et al., 2002; Machin et al., 2010; Rosset et al., 2009).

Moreover and most importantly, the organic farming in Cuba meets the 7 above mentioned criteria for agricultural sustainability and is therefore worthy of a deeper analysis, even though the Cuban context is linked to a series of institutional specificities that make a comparison with the Western systems more difficult. How has Cuba reached such impressive results, what steps were needed and which obstacles it had to overcome, will be the main topics of this part of our research.

First of all, it has to be acknowledged that the Cuban reality is completely different from the context of the developed countries. The agricultural sector has always occupied a critical place in the economic development of Cuba. Some consider it the most important sector of Cuban economy (Alvarez, 2004).

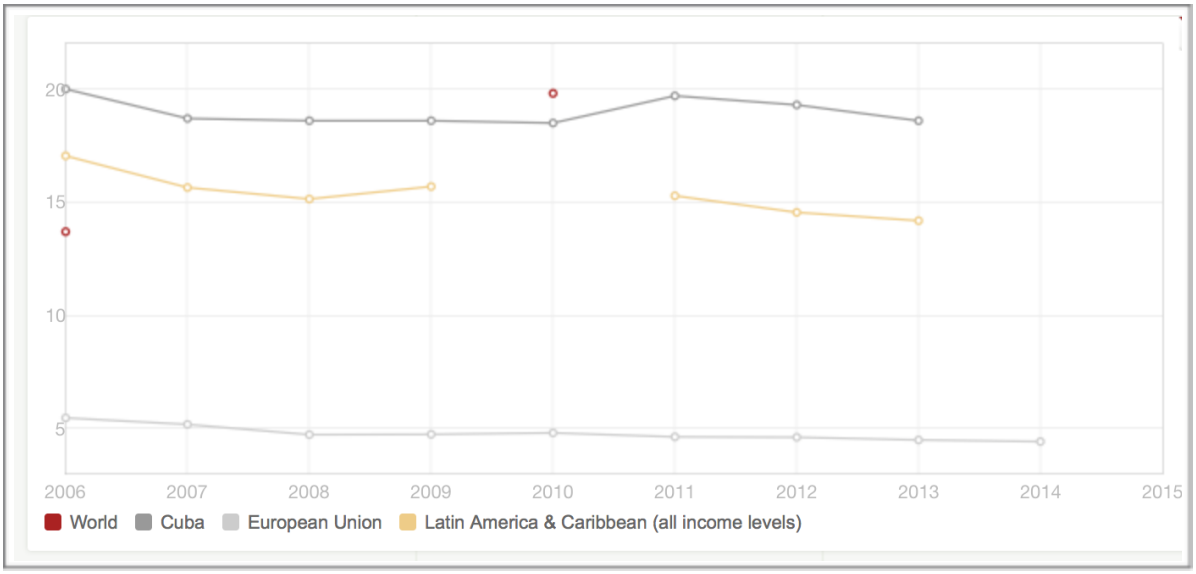

Figure 2: Employment in agriculture (% of total employment) in Cuba, in the world and in the European Union. Source: World Bank, 2016

According to the latest data issued by the World Bank (figure 2), currently 20% of Cuban active population is employed in the agricultural sector. Compared to the world average of 13%, which comprises both developed and developing nations, this is a significant proportion. Moreover, the labour presence in the agricultural sector is even higher in Cuba than in the rest of the Latin America. According to the data of the World Bank, the agriculture sector comprised the activities in agriculture, hunting, forestry and fishing.

Secondly, the value added of agriculture to the total national product of Cuba represents around 4,5 % of the total GDP, as demonstrated by the figure 3. This figure, issued by the World Bank calculates the value added as the net output of the agricultural sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources (World Bank database).

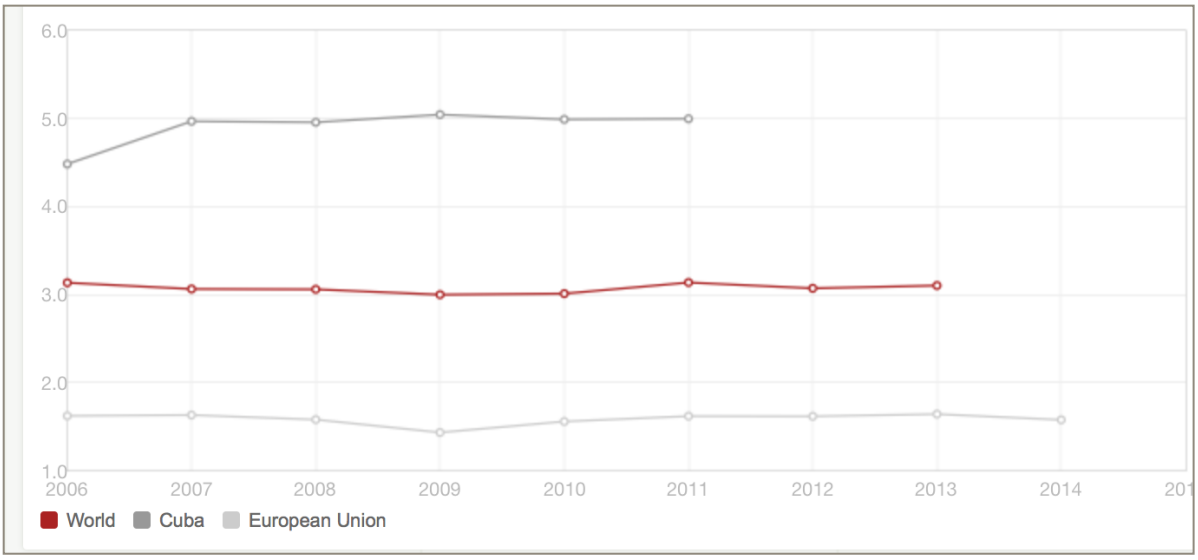

Figure 3: Value added of agriculture to the GDP of Cuba, compared to the world average and European Union . Source: World Bank, 2016.

Currently, Cuban agriculture is undergoing a process of profound and inevitable change. The drastic reforms in the agricultural sector were put in place since the beginning of the Revolution. The main reasons that have driven this change have been of economic kind, as a result of the scarcity of external capital inputs, in order to continue to develop according to the paradigm of the green revolution. In other words, they have not been primarily aimed at environmental conservation or use of sustainable technologies based on scientific approaches, but have been encouraged by the need to produce food from the available natural, material and human resources. These changes have not been pushed by the needs of the market either, as happens in the rest of the countries applying the organic agriculture.

1. History and the Role of the Ministry of Agriculture of Cuba in the transformations in the agricultural sector

Cuban agricultural policy is put in place by the Ministry of Agriculture, an institution itself worthy of focusing on, because of its rich and contested history. Since the outcome of the Revolution, health, education and housing were issues on which the Cuban government was putting the highest priority (Wright, 2012). Therefore, being able to feed its population represented since the beginning not just a merely socialist concern, but a priority that had to be accomplished.

It is estimated that the Ministry of Agriculture, with different names and powers, has existed since the colonial era. This institution has always had a direct impact on agricultural production and marketing in Cuba. The island was considered as a Spanish metropole, and it was seen as a mere supplier of agricultural products such as sugar, coffee, tobacco, wood, leather and others for the Spanish commercial needs. These products were fundamentally seen as raw materials, in other words, they did not need any further processing. The tobacco was usually exported in branches, the woods in skittles and the salted meat was also exported in the raw form. No production or crops that would compete with the metropolis were encouraged.

The monopoly policy, or in other words, the commercial exclusivism of Spain towards Cuba, allowed the island to trade only with the port of Cádiz, which was characterized by the establishment of various regulatory and governance bodies, such as the Governmental Tobacco Shop of 1716, created to monopolize the purchase and export of tobacco, setting its price at its discretion, and later became part of the Royal Company of Commerce in 1740, which monopolized all exports and imports, and was in charge of the trade of slaves, which were needed for its main activities.

This institution began to decline after Havana was occupied by the English in 1762, which resulted in the opening of free trade in all metropolitan ports with Cuba and other colonial enclaves in India. Free trade was completed in 1818 .

The Royal Consulate of Agriculture, Industry and Commerce was founded by Don Luis de las Casas in 1795 on the initiative of Francisco de Arango y Parreño, and it served as the representative of merchants and landowners, who also controlled the slave trade. The infrastructural deficiency, one of the principal obstacles to an effective nation-comprehensive agriculture, was also resolved in this period. The Royal Consulate was replaced in the early seventeenth century by the Royal Board of Public Works, which played a major role in the creation of the first railroads in the country, beginning the construction of the first stretch of road in 1835 and in 1838, the most important agricultural areas of the time could have been crossed. The Royal Development Board of recovered after its original name, calling Board of Agriculture, Industry and Commerce.

The Economic Society of Friends of the Country, also known in its early days as Patriotic Society, institution created during the colonial times in Cuba by the Spanish King Carlos IV following the example of similar societies existing in Spain, to support the growth of the Cuban economy, culture, education and society of the nation. Although it was not an administrative agency, was created to promote agriculture and trade, cattle breeding and popular industry, among others. José de la Luz y Caballero was one of his most notable directors. The Circle of Landowners, composed of large landowners, also had great influence in charting policies on agricultural production, trade, manufacturing, import and export.

In 1898, with the signature of the Treaty of Paris, Spanish Empire is over and Cuban territory is for the first time occupied by the US, before becoming independent as a result of the War of 1895. In this period, the occupying US government established in 1899, maintained the denomination of Secretary of Agriculture, which continued after the establishment of the neocolonial republic in 1902. This organization was instrumental in completing the US seizure of the Cuban agriculture, by grabbing the best lands.

With the Constitution of 1940, approved during the newly established Batista regime, the name of the Secretary of Agriculture changed to the current Ministry of Agriculture.

D. Evolution of the Cuban Agriculture

Cuban agricultural history starts with the period of Spanish colonization. The first inhabitants that were found in Cuba before the arrival of Columbus in 1492, were practicing traditional lifestyles, hunting for their survival, as well as cropping a large proportion of their diet, mainly bananas, potatoes, cassavas, beans and fruits like pineapple and *guayaba* that can be found in Cuba even today (Wright, 2012). In the pre-Columbian period, the indigenous inhabitants practiced very basic agriculture through which, thanks to fishing and hunting, they ensured their total food supply (Funes, 2010).

1. Sugar production

With the arrival of Diego Velazques in the beginning of the 16th century, the agricultural sector in Cuba gets reorientated, the land gets distributed according to the crops following the logic of the most suitable land for each crop. It is estimated that at the time of arrival of Europeans, between 60% and 90% of Cuba was covered by forests (Funes, 2010).

Introduction of sugarcane in Cuba was done by the conqueror of Cuba, Diego Velázquez, who introducing the sugar cane brought from Santo Domingo. Since that time ,the settlers begin to extract the juice called *guarapo* used for for making sugar. The excess of this home-brew sugar that made the colonists was used mainly for the negotiations with other settlers.

As soon as the lands in Cuba were occupied by the Spanish conquerors, starting with southern Santiago de Cuba and followed by the magnificent province of Sancti Spíritus in the center of Cuba, these occupiers became soon owners of those lands and started employing a series of integrated systems that resembled to today's idea of a farm. In these farms, a high number of crops was seeded. They put in place completely new agricultural practices, to which the indigenous people were not used to. As Fernando Funes demonstrated,

"*the transition from indigenous agriculture to the new forms of agriculture implemented by the Spanish conquerors may be considered the first step in the process of conversion in Cuba to European agricultural practices*" (Funes, 2010).

The Spanish settlers started to develop immense sugarcane plantations, and to this end they needed human capital. Therefore, in the 18th century, Spanish brought over 650 000 slaves from Africa to work on the sugar plantations in Cuba (Wright, 2009). Cuba was actually one of the first colonies to which African slaves arrived, motivated by the early extinction of the indigenous population by the Spanish colonizers and the growing need to exploit newly conquered lands. The period from the late XVI century to the early XVII century, is considered as a period of introduction of African slavery in Cuba. Given the lack of workforce to continue the colonization, the Spaniards began to bring small amounts of African slaves through the above mentioned Royal Company of Commerce of India, while performing sporadic purchases of English slave traders. Soon these amounts showed as insufficient for the development of the sugar and coffee plantations and more slaves were needed.

In the early XVII century, the export of sugar from Cuba began to flow to Spain through around fifty sugar refineries in the island. In the last decades of the XVIII century, Cuba continues under the Spanish domination with sugar processing, even though Haiti was first at that time (Amores, 1998). Cuban sugar takes its commercial expansion during the

XVIII century. The uprising of the Haitian people ruins the sugar industry of Haiti and Cuba becomes definitely the largest sugar island.

When Havana is occupied by the English in 1762, and trade in Cuba is opened to its colonies, the productions of sugar starts to increase. To this reality of the British presence in Havana must be added the fact that the following year, when the Spanish King retook possession of Cuba, the laws favoring the sugar industry, joined by the armed uprising in Haiti, made that by the end of the century about 6 thousand tons were produced with about 600 sugar mills.

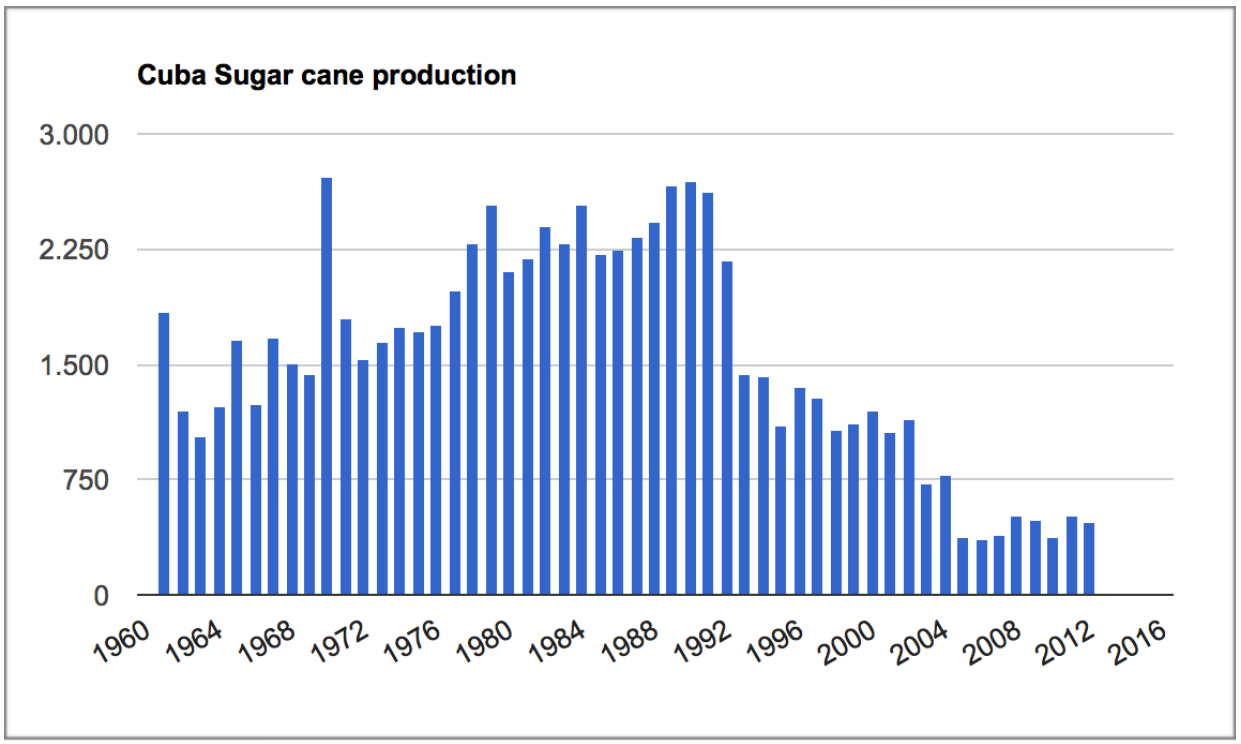

Figure 4: Cuban sugar cane production, in million international USD. Source: FAO, 2012.

The sugar industry intensified its development over the second quarter of the nineteenth century and was rising until the beginning of the Great War. Although prices were volatile and some were decreasing continuously, the decline was offset by an increased production. This increase was achieved in two ways. In the first place, by building new plants and, in the second place, by higher sugar yield obtained through better production techniques. In the twentieth century, when Cuba gained independence on 20 May 1902, the sugar plants are modernized with the introduction of new equipment and a new technology. The insular production had, at the end of the century, an economic result below the levels of previous

years as a result of the devastation that accompanied the War of Independence of 1895, which lowered by 75% the amount of the harvest. Half of the core assets needed serious repairs and the other parts were out of service.

After the uprising of Haitians and when Cuba took the world lead in the sugar production, the sugar mills are modernized, production was increasing and Cubans witnessed the formation of large estates of sugar, the so called *latifundios*. At the time of the abolition of slavery in Cuba, the first North- American investments start to spread in the island. The US were seeking unrefined sugar, that is to say, a raw material.

By the XIX century, the sugarcane plantations became the most mechanized in the world and were producing one third of the world total production of sugar. However, this production was dependent on the slave labour, which got abolished in Cuba in 1886 (Wright, 2012). As results from the data provided by FAO (figure 4), from the advent of the Revolution in 1959 until the dissolution of the Soviet Union, the production of sugar in Cuba was reaching impressive numbers. However, when doing research on Cuba, one has to take into account that after the Revolution, the quantity and the quality of economic statistical data worsened in a significative manner.

2. Start of the US presence in Cuba and the Creation of *Latifundios*

Following the War of Independence, called also War of 95, because started by José Martí in 1895 and finished in 1898, agricultural sector takes again a new dimension. Considering that the Spanish Empire comes to its end, Cuba is assigned under the protection of the United States, for the first time in the history, following the signature of the Treaty of Paris in 1898, which meant the start of the US implication in the Cuban affairs. Moreover, the slavery is abolished and the changes that would have brought this new independence will not be welcome by the rich Creoles of Cuba. They will not want to give up the slave labor that made them immensely rich. Cuban economy became closely linked with that of the United States. On the one hand, the tobacco industry was partially transplanted to the North American south. On the other, due to a sharp drop of sugar prices that took place from early 1884, the old Cuban "sugar nobility," unable to mechanize and cut costs, began to disintegrate and lose its dominant role in the island's economy and society (Hernandez, 2010).

From 1885 to 1898, a American food companies came to dominate ownership of the main plantations: 13 of the sugar *latifundios* were producing 70% of the total sugar production, and after 40 years the farms of small dimensions decreased to a half. At this time, 95 % of the cultivated land was in hands of private individuals and Cubans disposed of a very small part of *minifundios* (Wright, 2012). Already in this period, there was a significant difference in the methods used by the two kinds of land owners. Americans practiced a highly industrialized kind of agriculture, whereas the small Cuban peasant opted for a more traditional practice.

The growth of the large estate tendency was evident in the 1931, when a census reported 88,352 farms with 845,367 *caballerías*. Of these, 63,052 farms, 70% of the total, gathered only 12% of the land, while 2070 farms concentrated 59% of the territory. Only the Cuban Cane and the United Fruit Company together held more than 31,000 *caballerías*. (Alvarez, 1994). This represented a major reason for Fidel Castro, as stated in his book *La historia me absolverá* in 1953, to grant land ownership to all settlers, tenants and peasants who occupy parcels of five or fewer *caballerías*. That project took the form of Law in the Sierra Maestra in October 1958.

By the time prior to the Revolution, 73, 3 % of land was possessed by 9,4% of the land-holders (Nova, 2002 in Wright, 2012). Not only most of the best Cuban lands passed to the ownership of huge American corporations, but also, as demonstrated by evidence, huge parts of the land in the hands of private individuals were not being sufficiently cultivated, if at all. Fues proved in 2002, that 200 000 Cubans were landless and the level of unemployment was increasing (Funes, 2002 in Wright, 2012).

E. Revolution and its Implications on the Cuban Agriculture

There is an undeniable continuity between José Martí 's actions undertaken in the XIX century and the Revolution put in place by Fidel that triumphed in 1959. Cubans consider that this is a perfectly logical trajectory leading from one to the other and that the Cuban freedom, conquered in 1898 and soon confiscated by the powerful Northern neighbor, was legitimately returned to Cuba in 1959.

Before 1959, Cuban agricultural system was characterized by huge American-owned enterprises, so called "*latifundios*" controlling the majority of food production. With the triumph of the Revolution in 1959, the issue of the ownership was partially resolved (Funes F., 2009). Most of the previously American-led companies turned to the ownership of state with the *Ley 851*, promulgated on 6 July 1960, following the adoption of the fundamental law of Cuba in 1959, previously analyzed in the first chapter of this research.

On 5 February 5 1960, the Soviet Minister Mikoyan came to Havana and this visit represented the historic moment when Cuba signed the first initial agreement with the Soviet Union, under which the island would start receiving the Soviet oil at very favorable terms.

In his most famous book written in 1953 - History Will Absolve Me- which represented a part of the Moncada Program, Fidel Castro argued about the need in Cuba of an agrarian reform, implying a general transformation of agriculture and that would be applied to all its institutions. This was imagined by Castro through the transfer of the land to the peasants who worked the lands, without possessing them, and had to struggle against foreign domination and national Cuban bourgeoisie, which possessed enormous landholdings comprising the most profitable and fertile lands.

Many of these lands, however, according to Castro, remained unproductive, which contributed to the eradication of misery in the countryside, illiteracy, lack of medical and health care, poverty and destitution. This demonstrates that agriculture occupied a fundamental place in Castro's thoughts when initiating the Revolution of 1959 and was immediately after its triumph translated into important national reforms. Agrarian reform, after all, was one of the promises of the Rebel Army led by Fidel Castro. Months after Castro came to power in 1959, the new government undertook a redistribution of land among the peasants who worked, who then would be incorporated mainly in state-controlled cooperatives.

With the triumph of the Revolution, the sugar plantations that were in private hands were contested. In the first decades they continued to produce an average of 5 million tons of sugar per year. This was done by planting more sugar cane, lengthening the harvest up to nine months, and using more than one million *macheteros*, who were mostly "volunteers", which redounded to an almost negligible cost of production based on labor.

After four hundred years of Spanish and a half century of the American colonization, the country had an agrarian structure with deep deformations: a high presence of foreign capital, with US companies owning more than one million hectares. There were large cane and livestock estates, the mono-exporting economy was mono-productive and had low use of the surface and poor living conditions of the peasantry and agricultural workers. All this, coupled with a poor preparation of human capital and a few knowledge in the agricultural sector, further worse the situation.

1. First Agrarian Reform Law, 17 May 1959

All these factors led to the necessary and unavoidable Agrarian Reform, which was already reflected in the political program of the Revolution, even many years before its triumph. The *First Agrarian Reform Law* was approved right after the Revolution, on 17 May 1959 in La Plata, Sierra Maestra, from where the Revolution itself started its path. With this law the transformations of Cuban agriculture began to evolve. As a result of this first agrarian reform, the state became the owner of 40% of the land across the country. According to individuals who supported this law, its aim was to eliminate the situation of exploitation of the peasantry, which hitherto had been condemned to live in a situation of real harassment by the rural guards. The status quo prevailing before the signature of this law was a one that comprised up to 80% of the best Cuban lands in the hands of a group of US large companies. Thus, through this law huge territories became popular farms and agricultural production was organized in products such as rice, citrus, cattle, coffee, meats, tobacco and other products.

The First Agrarian Reform represents one of the first laws of the Cuban Revolutionary government. It settled large estates and one of its main objectives was the redistribution of the land of the country in order to favor the poorest peasants. In this way, it fought both latifundia and minifundia, as it limited the rural surface to 30 so called *caballerías*, corresponding to around 402,6 hectares. It also fixed a minimum surface of 2 *caballerías*, as deemed vital for the survival of a family of 5 members. The surplus land was expropriated and to a certain extent, distributed: two years later, in 1961, 100 000 farmers received a title of property given that around 3 000 000 hectares had been subject of distribution.

Moreover, this law hurt the interests of domestic and foreign landowners and aligned them against the Cuban Revolution. Many of these touched owners immigrated to the United States, mostly Miami, where they organized anti-Revolutionary movements.

It was the most momentous of the measures taken by the Revolution in its first stage, because it benefited more than 100,000 peasant families and dealt a blow to landlordism and imperialist domination over Cuba. It eliminated the right of foreign companies and individuals to have land to own land in Cuba, except those that were small farmers.

This reform set at 30 *caballerías* (402 hectares) of land the maximum a person could own. It also included the creation of the National Institute of Agrarian Reform (INRA) to implement these measures, which would be chaired since the beginning by the Prime Minister, Fidel Castro. The law consisted of 67 articles, 7 transitional provisions and a final provision. The last conferred to the Agrarian Reform Law to declare it constitutional status of the Basic Law of the Republic. It stated:

"A estos fines la Revolución se ha propuesto dictar las normas que darán resguardo y estímulo a la industria, y que impulsarán la iniciativa privada mediante los necesarios incentivos, la protección arancelaria, la política fiscal y la acertada manipulación del crédito publico, el privado y todas las otras formas de fenómeno industrial, a la vez que encaminan al agro por los rumbos del indispensable desarrollo." (First Agrarian Law , art. 2) [10]

Indeed, as announced in the wording of the law, private initiative was supported by the government, through the creation of the cooperative forms of agricultural production. This will be even more straightforward with the promulgation of the Second Law which will follow in 1963.

The expectations from this law were numerous, as Fidel announced on the radio, he was awaiting, thanks to this law, that the peasants increase considerably their income, which would constitute a contribution that would serve the domestic market for industrial development and thus, through agriculture and through industry and trade, the economic problem would be solved in Cuba. The measure, announced by the Revolution, had the immediate support of the majority of Cubans. The Agrarian Reform Law confiscated all the

[10] To this end, the Revolution has proposed to make rules that give protection and encouragement to the industry, and that will drive the private initiative through the necessary incentives, tariff protection, fiscal policy and successful manipulation of public credit, private and all the other forms of industrial phenomenon, while the agro will be routed by the direction of its essential development (free translation).

properties of over 400 hectares from the hands of huge American corporations and gave the land to many farmers, through the cooperative form.

For some scholars, the First Agrarian Reform Law has its antecedent in Article 90 of the Batista Constitution of 1940, but that is far from being true. The Magna Carta of 1940 banned the "*latifundio*" from being a brake on agricultural production and as a means of reversing the Cuban foreign landowner, but never managed to transform the latifundia particularly in large estates of State.

Even though the First Agrarian Law recognized that in order to create economic progress in Cuba, a growth and diversification of industry is needed in order to facilitate a more efficient use of their natural and human resources, through the elimination of dependence on agricultural monoculture, which still subsists in the fundaments and is symptom of the inadeguate economic development of Cuba, this was not achieved in 1959, and is not achieved completely today either.

The Revolution, however, placed an enormous importance on industrialization and on the progress of science and technology. This has on one side led to a massive industrialization of the way in which most of the food was produced, and therefore on the high degree of dependence on the external production inputs. On the other side, this industrial and technology-oriented governmental conviction helped Cuban researchers find a quick alternative once the industrial agricultural system was put in crisis and obtained the governmental support in the national transition to the organic agriculture.

2. Second Agrarian Reform Law, 13 October 1963

Second Agrarian Reform Law of 1963 was adopted as a measure to complete the First Agrarian Reform Act of 1959 that had failed to completely eliminate the landowners of some sectors of Cuban agriculture.

The economic and military measures put in place by the American administration began immediately after the first revolutionary reforms were taken in Cuba, which have been deeply affecting the interests of the landowners- *latifundistas*. These measures forced the revolutionary state to enact in October 1963 a Second Agrarian Reform Law, which limited

individual surface of the ownership to 5 caballerías, i.e 67 hectares per person (Alvarez, 1994).

Indeed, that law stated:

"*La existencia de esa burguesía rural es incompatible con los intereses y los fines de la Revolución Socialista.*" Second Agricultura Reform Law, Art. 2[11]

In this way, the rural middle classe was eliminated and Cubans became owners of 70% of the land. The figure of the state enterprise, as a distinctive feature of Cuban agriculture and a determinant of its ownership structure, was consolidated at that time. Indeed, state sector included now around 63% of the cultivated lands.

Both reforms were implemented by the National Institute of Agrarian Reform (INRA) of Cuba, created by the Cuban Revolution in 1959 to implement economic and social policies related to land reform, the main promise of the Revolution. Commander in Chief , Fidel Castro, was named President of the National Agrarian Reform Institute since its inception. In 1976, it was replaced by the Ministry of Agriculture (MINAG), institutional continuator of the INRA. The latter met with the opposition of the great livestock farmers, it accelerated expropriation of the major lands and controlled nearly 90% if these, after a year and a half. The exceeding lands were transformed into *granjas del pueblo* (state farms). At the end of 1962 State possessed 44% of these land.

The limited private initiative, one of the innovations of this new agrarian law, was represented mainly by former poor peasants: the old farm unions were abolished and replaced in 1961 by *ANAP- Asociación Nacional de Agricultores Pequeños*, which began to provide the material, credits and direct production.

This new agricultural policy put into question several times its goals and methods. firstly, its main objective was to seek a diversification of agriculture to achieve economic independence. In 1960, upon termination of the purchase of sugar by the United States, the

[11] The existence of the rural bourgeoisie is incompatible with the interests and goals of the Socialist Revolution (free translation).

Soviet Union became the principal buyer, but without any sort of guarantee for the future, which was turned indeed critical at its dissolution in 1991.

Cuba, which was sorely lacking in material and labour, decided not to promote the production of sugar anymore at the same extent as before, and its numbers began to decline. Diversification seemed the only response to the situation created by the North American blockade. The imbalance between domestic demand and production led to the introduction of a centralized rationing system. The food production, mostly of rice, beans and corn, increased, but this policy also led to a dispersion of efforts and lower level of yields.

However, the implementation of the two agrarian reforms in 1959 and 1963 respectively, meant essentially two things for the renewed Cuban economy: firstly, the establishment of state sector in agriculture and secondly, the continuation in the Cuban agriculture of the policy of monoculture, as a result of highly industrialized system, chosen with the advent of the Revolution, despite the fact that it the monoculture policy was one of the reasons giving impetus for the reforms. It will only be challenged with the advent of the organic methods, when the small- scale farmers will manage to diversify the production, by producing in small *organopónicos,* representing a kind of urban gardens in which plants are cultivated on a substrate composed of soil and organic materials, mixed in a container and which is based on the principles of organic agriculture. This organic farming method will be the subject of the next chapter.

Nonetheless, the lower level of yields registered in the 1960s following the application of the two agrarian reforms led to a reassessment of the priority to diversify the agricultural production. Thus, a new agricultural policy is set up in 1963, when Castro declared that agriculture will be the basis of the economy for at least a decade and sugar will occupy a special place as a basis for developing the economy. It was therefore more convenient to produce more sugar to be able to buy rice, than produce both rice and sugar.

This change of mindset was the consequence of new external factors, the most important being probably the Cuban-Soviet agreements of 21 January 1964, which guaranteed a planning of the sales of sugar until 1970. The agreement provided for progressive sugar purchases and its main advantage was that Cuba was in this way safe from world price fluctuations and could plan its economic development. In contrast, this step represented a return to the dependence on sugar.

To this end, in 1965 Ministry of Sugar is created. This institution represented for more than 45 years, the governmental body responsible for directing, implementing and monitoring state policy and Cuban government activities regarding sugarcane agriculture, sugar industry and its derivatives. [12]

Cuba was unable to sell produce on the world market, it became dependent on the Socialist Bloc for resources it could not, or did not, produce itself: petrol, gas, certain foodstuffs, pesticides and machinery (Wright, 2012).

Sugar became the lever of the economy and Fidel Castro contemplated the challenge to realize in 1970 the highest harvest of all time, namely 10 tones. This challenge of Ten Million mobilized the entire country, but the bet proved to be a failure. However, this mobilization demonstrated to be important for the sorts of the country. By having created serious distortions in the national economy and following a government criticism in 1970, important lessons have been learned. Namely, the sugar goals would henceforth be more realistic, and the country's agriculture got, again, reorganized.

In 1976, when INRA turned into the Ministry of Agriculture, State farms become a sort of public enterprises with their own budget. It is the beginning of the cooperative forms of agriculture in Cuba, which will later represent the institutional basis for the outset of the Organic Revolution. Small farmers were protected and assisted by the State, in other words, these new small properties that covered around 25% of cultivated lands were widely aided by the State in matters of services, teaching, health, and with the flow of products.

3. Cooperative Forms in Cuba as a Starting Point for Organic Revolution

Cuban agricultural history has characterized by a long tradition of agro-export crops grown under conditions of monoculture (Le Riverend, 1970; Moreno Fraginals, 1978; Marrero, 1974-1984, Funes, 2010). The reason behind this choice for the policy of monoculture, as already explained above, were are related to the old history of Cuban sugar plantations that since the beginning of the Colonization occupied the best Cuban lands. This monoculture policy was also applied in the field of tobacco production and only a small

[12] In September 2011, the Cuban government announced the dissolution of MINAZ and in November the creation of the state Azcuba group, which assumed many of the functions of the defunct ministry.

number of crops were seeded for the domestic consumption of the Cuban population, such as sweet potatoes, avocados, beans and several fruits.

In order to fight the issue of monoculture and to differentiate Cuban agriculture in order to increase its productivity, in the decade of the 1960, small farmers and peasants began to organize between themselves, share their knowledge and start coordinating the state distribution of inputs for agricultural production, management material resources and centralized reception of credit provided by the State.

In 1961 the National Association of Small Farmers (ANAP) is created. Today this association still represents the umbrella organization including and defending the majority of farmers in the country, and has played, since its creation, a leading role in the economic transformations of the agricultural sector in Cuba. Today this peasant movement makes part of a global peasant organization called *La Via Campesina*, that bases itself of the principle of knowledge-sharing from campesino to campesino. This aspect will be further analyzed in the last chapter.

One of the values of the Revolution is represented by respect for the will of peasants. And it was under this premise, that Cooperatives of Credits and Services (CCS) were created, following the implementation of the First Agrarian Law in 1959, as the primary organizations of collective nature. With the Second Agrarian Reform, the cooperative forms in Cuba are made official.

These cooperatives enable the common use of irrigation, some facilities, services and other means, and the overall processing of their claims, although the ownership of each property, equipment and the resulting production remain private. It is in these organisms that farmers maintain individual ownership of land, but they stay however bound to use certain services for which they have to pay. Today, there are 2203 of such cooperatives in Cuba, and they all comprise almost 150,000 members.

The Cooperatives of Credits and Services have been showing high efficiency, and therefore in recent years the Cuban state has been developing a movement to strengthen this type of organization, especially raising its management capacity. For some time the *Peasant Associations* existed in parallel with the *CCS*. In the end of the 1980s, the remaining ones were all transformed to Cooperatives of Credits and Services.

In addition, Cuba saw also the creation of the sugarcane cooperatives, which were established in the nationalized lands out of the sugar plantations that existed before 1959. Nonetheless, this movement lasted only until 1961, a moment in which once it was decided that the sugar harvest was done, these units should become State farms.

Evidence has shown that during the first and a part of the second decade of the Revolution, there was no awareness and one could not see clearly the real necessity of carrying out agricultural development in the country through the movement of *cooperativization*. The latter used to be conceiving only through the state plans. During the V Congress of the National Association of Small Farmers (ANAP), President Fidel Castro recognized:

"*We could not seen clearly understand the convenience of using two different ways.*"

A very important moment for the official establishment of the organic movement in the Cuban administration is represented by the signature of the agreements reached at the First Congress of the Communist Party of Cuba and the V Congress of the ANAP. It is since this moment that the the Party, the whole government and the ANAP begin to take a direction in providing full and decisive support for the development of cooperatives, this fact has marked a new stage of co-operative in Cuba, when the Agricultural Production Cooperatives (CPA) having as reference the aforementioned the Cooperatives of Credits and Services (CCS) arise and the Agricultural Societies that emerged in the 1960s almost spontaneously from the enactment of land reform laws

"Much of the 80 per cent of all farmland that was once held by the state was turned over to the workers and re-established as worker-owned enterprises. Although peasants did not own the land, they were allowed to rent the land indefinitely and free of charge as long as they continued to meet production quotas for their key crops" (UNEP, 2016)

Public policy making initiated this transformation within the context of the *Programa Nacional de Agricultura Urbana* (National Programme of Urban Agriculture) in 1994. As the program itself stated, it was necessary to:

"*encourage urban farmers to produce diversified, healthy and fresh products. Havanans transformed their vacant lots and backyards into small farms and grazing areas for animals.*

This resulted in 350,000 new well-paying jobs (out of a total workforce of 5 million), 4 million tons of fruits and vegetables produced annually in Havana (up tenfold in a decade) and a city of 2.2 million agriculturally self-sufficient inhabitants.2 In 1994, a department of urban agriculture to support additionally local farmers was created."

The following figures demonstrate that the cooperative forms is still characteristic for the agricultural production in Cuba. As of figure 5, UBPCs cover still the biggest part of cultivated lands and the biggest number of members is assigned to the CCS.

Entities	Number of cooperatives	Agricultural area (1,000 ha)	Members	Productive scale (ha)	Individuals per ha
UBPC	1,983	1,853.4	160,000	934.6	0.09
CPA	995	590	53,961	592.9	0.09
CCS	2,518	1,242.0	352,565	493.2	0.28
Individual farmers		390	50,000	7.8	0.13
New leaseholders (decrees 259, 282 and 300)		1,369.0	172,000	7.9	0.13

Figure 5: Current presence of the non-state agricultural entities : UBPC, CPA, CCS and small producers. Source: Álvarez, Anicia García, and Armando Nova González. "Food Production and Import Substitution in the Cuban Reform Process." *No More Free Lunch*. Springer International Publishing, 2014. p. 86

Moreover, according to figure 6, non-state tenure of lands in Cuba currently overcomes the previous historic numbers relative to the state tenure.

Agricultural area	Total	State	Non-state	UBPCs	CPAs	CCSs and private farmers[a]
2007	100	35.8	64.2	36.9	8.8	18.5
2011–2012	100	17.0	83.0	23.0	9.0	51.0

Figure 6: Forms of land tenure in Cuba. Source: Source: Álvarez, Anicia García, and Armando Nova González. "Food Production and Import Substitution in the Cuban Reform Process." No More Free Lunch. Springer International Publishing, 2014. p. 86

However, the beginning of the economic crisis of the 1990s, motivated by a number of external factors such as the disappearance of the socialist camp, the Council for Mutual Economic Assistance (COMECON), the tightening of the economic blockade imposed by the

United States and some additional internal factors, imposed the need to change the production relations, to seek and establish new forms of land use, to liberalize the development of productive forces and to start a process of revival of agricultural activity. All this lead to a series of economic reform characterized by numerous, deep structural and organizational changes in the agricultural sector where the central link is going to be represented by the land ownership.

In 1990, as a reaction to the hard times for the agriculture in Cuba, the Revolutionary Government started to give preference to small-scale production, aimed at increasing the biodiversity of production.

One of the main achievements of this policy occurred in 1994, when the Cuban peasant could start selling directly a part of their yields to the population. This was made possible thanks to the adoption of the Law of *Usufructo,* in 1992, which initiated in the Cuban legal system a sort of mixed state-private ownership. Following the redistribution of lands to the farmers based on the principle of usufruct, they became their owners and did not have to sell the integrity of the production to the State.

III. Organic Revolution in Cuba

Cuban organic revolution in its concrete form will be the main theme of the third part of this research. When trade relations with the Socialist bloc collapsed in 1991, food imports declined by more than a half, the pesticides did more than 77%, and the availability of oil for agriculture by 50%. Since than the Cuban agricultural sector has been characterized by mainly three factors: diversification of the alimentary products, decentralization and the pursuit of food self-sufficiency (Funes, 2007). All these three elements are part of a wider context, that was given the name of organic farming. When introducing the topic of organic agriculture, I would like to clarify some fundamental differences relative to the concepts that will be used throughout the research.

As defined by the National Research Council:

- Farm is a single operational unit that manages natural resources to then provide food to the users.
- A farming system is a mix of crops or animal components, or some combination thereof in a farm, and their arrangement over space and time within the farm, the resources and technologies used in their management and the nature and effectiveness of hierarchical relationships both within the farm and with the ecological, social, economic and political environments within which it operates. The farming system is related to community aspects, market integration, labor relationships and integration with other influencing factors.
- Food system refers to the complex set of actors , activities and institutions that link food production to food consumption.
- Conventional crop production makes use of synthetic pesticides and herbicides, and supplement nutrients generated on the farm with synthetic fertilizer to maintain soil fertility (Jackson-Smith, 2010).

Therefore, what will be here described as organic farming, has been developed as an approach to respond to perceived problems associated with conventional farming.

The first step made in the 1990s, was an effort to increment the diversification and heterogenization of the products compared to the policy of monoculture that was being practiced during the last 5 decades prior to the dissolution of the Soviet bloc.

Secondly, through the introduction of the right of usufruct and creation of the cooperatives, important changes at the level of land ownership contributed to the decentralization of agricultural production, diminishing the land proportion held by the State from 80% in 1990 to 20% in 2008 (Funes, 2007).

Moreover, decentralization was also implemented through the reduction of the scale of the production, putting an emphasis on small-scale farming.

And finally, local production was preferred, compared to production dedicated to export finalities, which enabled to reach a significant degree of self-sufficiency of the Cuban population, instead of producing for merely commercial purposes.

The Revolution of 1959 placed an enormous importance on industrialization and on the progress of science and technology in the country. This has on one side led to a massive industrialization of the way in which most of the food was produced, and therefore on the dependency on the external production inputs. On the other side, this industrial and technology-led governmental orientation helped Cuban scientists and farmers find a quick alternative to the industrial model once the agricultural system was put in crisis.

This alternative was represented by the spreading of a national transformation from a chemical intensive to organic model of agriculture. The latter was using local resources, was done on a small scale and was not dependent on chemical inputs. This innovative, but at the same time very traditional and old approach, obtained the support of the Cuban government in the transition on a national scale.

The Cuban administration eased the implementation of to the organic agriculture by introducing a series of crucial reforms in the 1990s. These involved mainly the introduction of the cooperative form for the land use and cultivation, already introduced in the 1970s, and now improved with the introduction of the right of usufruct and the distribution of unused and uncultivated lands.

In brief, the following measures were put in place, giving the appropriate conditions to Cuban farmers to opt for an organic conversion:

- agrarian decentralization
- land redistribution to farmers (through the introduction of the law of *usufructo*)

- agro-ecology or the attempt to be self-sufficient in the food supply (Funes, 2012).

However, it has to be acknowledged that the real solution to the food issue created during the Special Period was the introduction of an agriculture in *organopónicos,* in other words, *urban organic gardens*. Given that before the crisis, most of the agricultural production was achieved in the rural areas and the capital, Havana, was almost unproductive, the implementation of *organopónicos* represent a real breakthrough : by bringing the agriculture to the cities, by urbanizing the whole food system, by changing the eating habits of the Cubans and by moving the farmers to the suburbs of the cities.

Nonetheless, it is concretely the shortage of petroleum that represented the major challenge for the Cuban agriculture. The food production model that was in place in Cuba since the advent of the Revolution in 1959 until the 1990s was characterized by its extreme dependence on oil. The latter was not only used in the industrial machines to make them function, but it was especially used in the transportation. Therefore, the food crisis of the 1990s was first of all entrenched because of the impossibility to transport food from one region to the other. This problem, however, was brilliantly solved by giving national priority to local productions, and therefore making the access to food easier.

It can be resumed that the agricultural system in Cuba experienced a double challenge: the need to double food production while their inputs decreased by more than half, while maintaining export crops not to further deteriorate the desperate situation of the balance of international payments in the country. Cuba reinvented itself and returned to normal, by showing the best food production performance in Latin America and the Caribbean in the period from 1999 to 2005, corresponding to an annual growth rate of 4,2% when the average of the region was 0% (FAO, 2006).

Cuba developed a highly industrialized agriculture in the years both prior and following the Revolution, which created a significant degree of dependency on the technical expertise imported from the Socialist bloc, as well as, on the chemical inputs necessary for such a kind of food production. Practices of “chemicalization”, “tractorization” of agriculture and other extensive use of agricultural machinery, contributed to the degeneration of Cuban natural environment. Deforestation, soil degradation and erosion owed their existence to the

intensive chemical use, machinery and large-scale irrigation put in place in the period between 1959-1991 (Treto et al, 2002 in Wright, 2012).

Having said this, after the food crisis that broke out following the dissolution of the USSR, Cuba proved to be a master of transforming necessity into opportunity, through the experience of organic revolution with its numerous economic, social and environmental benefits. Cuba of today is recognized for the largest conversion of the land farming methods that took place in history, from conventional agriculture, intensive in chemicals, to a model based on organic materials. Unlike the isolated sustainable agriculture movements that are developing in most of the developed countries, Cuba has become famous for the development of a massive organic movement with wide, popular participation (Funes, 2009) and through a significant support of the Government.

Organic agricultural movements in the industrialized countries usually start with challenging of the existing system, in reaction against what is generally perceived as the excesses of the industrial agricultural technology, deemed as not respectful of the natural environment or consumers. Therefore, like any other minority protest generated outside the system, it has the force its way through to exist and to be heard. This image of extremism has long served to reject it.

However, the Cuban reality is different. The transition to the organic agriculture was not an independent choice, pushed by the market necessities and mere environmental concerns. It was constrained by two important factors: external factors represented by the political changes during the period of the Cold War, namely the American trade blockade on Cuba and the disintegration of the USSR; and secondly, the internal necessity related to the external factors. In other words, the imposition of embargo and the dissolution of the Soviet Union contributed to the shortage of the vital products necessary for the proper functioning of the agricultural system and therefore represented an internal condition and impetus for the change in the way food was produced in Cuba . Without an outside source to provide farm equipment, tools, fertilizer or chemicals, the country's farms became organic by default (*Vivero Alamar* website).

The aim of this part is to analyze the effects of the reduction of fuel imports on the Cuban agriculture as a part of a rapid re-orientation of the agricultural principles in Cuba. This transformation happened by developing a low-petroleum food system (Wright, 2012),

not depending on the fuel imports to which it did not have the access anymore. Cuba managed this transition, seen as the most difficult period and owes its success to the institutional support it has received almost since the beginning.

The research framework that I take into account when researching on the Cuban case is specific to the Cuban reality and based on the following points: it is deemed that on the top, there is the overall context underlined by Cuba's condition of vulnerability to external events, mainly international isolation.

This overall context has created a series of external forces that drove the transition to organic: as a matter of fact, these external forces impacted the institutional structure in place in that moment. In other words, the internal driving forces, represented apart from the institutions, by values, perceptions, beliefs, ideas, know-how. These two factors conducted jointly to the organic transformation by having a direct impact of the last actors of our research framework- farmers themselves. This is because the farmers are the ones who produced and absorbed the internal driving forces by sharing beliefs and ideas and agricultural know-how.

Both institutions and farmers can be considered as being part of internal change-driving forces, who translated the impact of external forces to concrete farming strategies and policies. It is clear that such a framework relies on the strong role of state, which was typical to the Cuban case, because of its centralizing nature. The State had under its control several institutions, from the Ministry of Agriculture to the State farms themselves.

In this way, State could influence the farmers mainly via two ways. Firstly, trough the implementation of multi-year production plans and secondly, through the disposal of the farmers working on the lands attributed by the State, investments and production inputs. Hence, the administration was obliging the farmers to produce a concrete amount of food in order to keep being recognized by the State.

To give an illustration of the Cuban agricultural revolution, I want to demonstrate how a country like Cuba, developing and poor, managed to achieve a global success and feed its population in times of crisis. Apart from demonstrating the ineffectiveness of the industrial farming system, I will analyze the concrete stages of this organic transition. Its main characteristic is that the organic movement was created within a framework of cooperatives.

As Álvarez pointed out, cooperatives became the fundamental basis of the agricultural Cuban model during 1993-2008 period (Álvarez, 2012). In the second part of this chapter, the analysis will focus on the implementation of *organopónicos*, that represented an innovation because sprung the rural migration to the urban areas.

Havana, the capital of Cuba, is inhabited by 2,105 million of people (Source: UN), in other words by 20% of the Cuban population. It is also the biggest city in the Caribbean region. After the outbreak of the food crisis, during the Special Period in the 1990s, the city experienced some devastating effects related to the fuel shortage. However, thanks to the introduction of *organopónicos*, in the form of urban gardens that reached upon the local communities, the food supply was provided and controlled. Lastly, my objective is also to show that the idea of organic is nothing new in Cuba. It was already studied and praised by José Martí in the XIX century and later his ideas were reproduced by Fidel Castro. However, in the current globalized world it seems like the implementation of organic food systems has started only as a reaction to the concerns with the environment, presented to the attention of public after the UN summit in Rio in 1992.

Fernando Funes Monzote is considered to be the initiator of the organic farming and agro-ecologic movement and his research inspired a significant part of this thesis because of his radical vision about the Cuban agriculture. He began as a farmer in the urban gardens of San Antonio de los Banos in Cuba and later decided to research about his practical activities. He is recognized as a distinguished agro-ecologist, and has been awarded many global prizes in the field of agriculture and food security research. Funes defends a resource-efficient farming as an alternative to both capitalist food systems led by the profits of huge corporations and to the state-run agricultural model which in Cuba led to disastrous consequences since 1959 and which left the country with the need to import the biggest part of its food (Nick Miroff, Washington Post).

Moreover, Fernando Funes pointed out about an essential controversy in Cuban current agricultural situation, which has later became known as “Cuban agricultural paradox”. Besides pointing out the immense environmental-friendly success of Cuban organic agriculture, Cuba still imports the biggest part of its food supply, needed to sustain its population. This paradox has been underlined by various scholars (Avery, 2009; Hurt 2009)

claiming that the organic success was a mere Communist lie. Interestingly, Funes has been able to contest the criticism, by providing a brilliant overview of the import situation in Cuba.

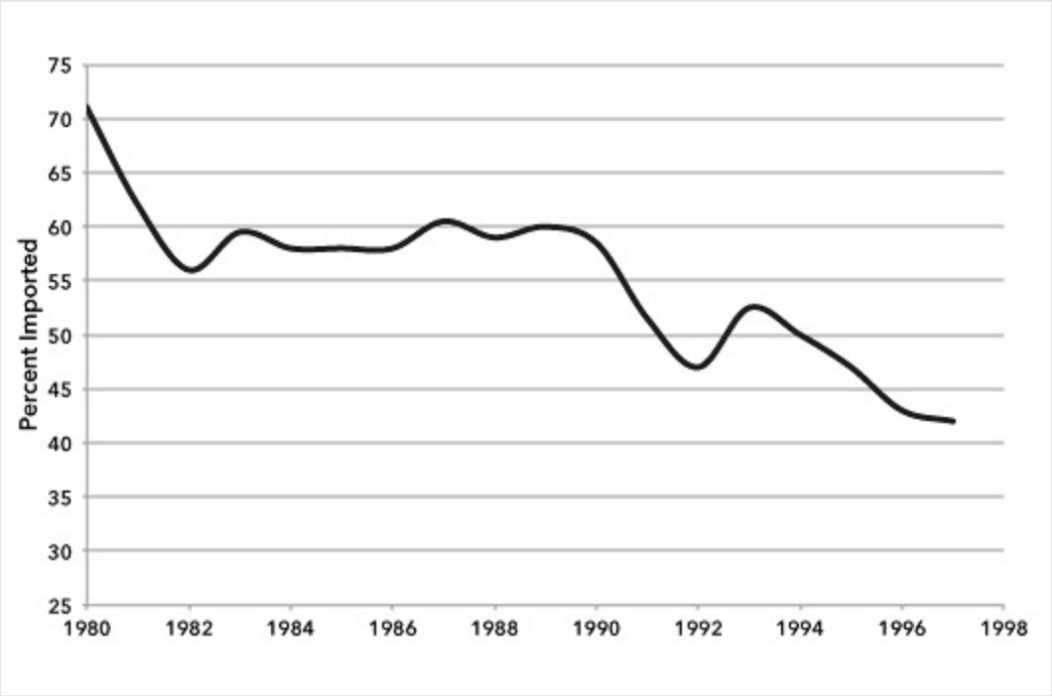

Figure 7: Cuban import dependency, 1980-1997. Source : José Alvarez, The Issue of Food Security in Cuba, 2011 in Funes, 2012.

According to him, and to the evidence provided by the annual reports of FAO, the quantity of imported food relates especially to the food distributed through the *libretas*, in other words, government regulated ration cards. Right after the critical Special Period of the decade of the 1990s, the food imports drastically diminished (Funes and Altieri, 2012), as demonstrates the figure 7.

Cuba's success has also be attributed to its highly developed academic context. Indeed, the country experienced an important change of direction in the field of science: following the outbreak of the food shortage, the Cuban government asked its scientists that represent 11% of the scientists of the total number of scientists in the Latin America, to come up with technological innovations[13] to face the food issue. To that end, the Government emphasized the training of human resources in order to create a large number of scientists and

[13] Even though the total population of Cuba represents only 2% of the whole population of the Latin America, they contribute with more than 11% of Latin American scientists.

researchers aiming to produce innovative ideas and knowledge-intensive solutions to face the food crisis.

A. Sustainable and Organic Agriculture in José Martí' s teachings

The first premises of the concept of organic agriculture and its advantages date back to the times of Jose Martí, one of Cuba' most recognized intellectuals, poets and a convinced revolutionary leader, who lived in the second half of the XIX century.

José Martí was the first in Cuba to think of the impact of agriculture on education and on the cultural development of a given population. As he wrote in his famous essay *"Great America"*, he said he was convinced that the future and the greatness of the people of both Americas stayed in the development of its agricultural wealth and that children should be taught to recognize and appreciate that agricultural wealth as being the only constant source, entirely true and pure, of the wealth.

In this context once again he reiterates:

"Being good is the only way to be happy. Being educated is the only way to be free. But the commonality of human nature shows us that there is a need to be prosperous in order to be good. And the only way that leads to a constant and easy prosperity is by learning, growing and taking advantage of the inexhaustible and indefatigable elements of nature ".

It is interesting to observe that the current principles of sustainable and organic farming correspond to some criteria announced by José Martí in his numerous works. When conceiving what farming techniques should be disseminated and taught, it is surprising that this National Hero of Cuba and Apostle of Independence, has also referred to agricultural techniques that today are understood within the context of organic and sustainable agriculture and agro-ecology.

Among these, we can mention that he was a convinced defender of diversification of agriculture and worried about the trend towards monoculture that countries of Spanish America, especially Cuba, were facing because of the cultivation of sugarcane which was increasingly prevailing on other crops.

In his *Trade agreement between Mexico and the United States*, he declared:

"People committed suicide the day they fixed their livelihood in a single fruit".

And in "*Letter to the Nation"* published in 1885, he said:

"The much land has to be cultivated, and several crops, never just one".

In *"Cheese"* he goes on to say the following:

"Agricultural diversification and abundance of minor crops should be a chapter of our agricultural Bible. Minor crops under various agricultural branches and related industries, maintained in equilibrium unfortunately peoples to exclusive major crops: coffee, sugar cane, and with magical bubbles, which are already gold and soap. Better, if rein breaks in the race, take the horse reins a lot."

B. Cuban politics, Castro and the Environmental Issue

Since the advent of the Revolution until 1976, it is considered that in Cuba was in place such an institutional design that saw the revolutionary government concentrating all the power and centralizing all the executive, legislative and constitutive functions of Cuba. It did not differentiate between state- and governmental actions. The laws dedicated by the government had a constitutional character and oriented all the aspects of the social life within the unique decision- taking organ. Therefore, any decision taken by Fidel Castro was immediately recognized and considered as having a legal effect. The same was true for the matters related to the environment. It can be said that the reforms about the small-scale agricultural local production represent a way to comply with the fight against the natural degradation in Cuba , apart from being a response to the shortage of production inputs. Meanwhile, in the legal system the environment has been granted constitutional rank in the fundamental law of the Republic of Cuba of 1976, amended in 1992. Article 27 makes a law of a fundamental principle :

"El Estado protege el medio ambiente y los recursos naturales del país. Reconoce su estrecha vinculación con el desarrollo económico y social sostenible para hacer más racional la vida

humana y asegurar la supervivencia, el bienestar y la seguridad de las generaciones actuales y futuras. Corresponde a los órganos competentes aplicar esta política."[14]

For Fidel Castro, environmental issues have always held a primary place in his thinking. One fact worth of mentioning is that he was concerned about the environmental topic already in the 1960s when the other, mainly developed, countries did not consider this issue as urgent yet:

"Pasan rápido 20 años y (...) estamos conscientes de los problemas que esperan al mundo en las décadas futuras, en todos los sentidos; la población creciente, que alcanzará más de 6 000 millones de habitantes; los problemas de la alimentación, del agua, los recursos naturales, la contaminación, los problemas del subdesarrollo que se proyectan hacia los años futuros para una gran parte de la humanidad (...) pienso realmente que para el hombre enfrentarse a estos problemas será un reto muy serio, y creemos firmemente que nuestra juventud debe estar preparada para enfrentarse a ese reto". [15] Fidel Castro

Similarly, in his very famous discourse pronounced at the General Assembly of the United Nations in 1992, he insisted on the fact that we are currently dealing with problems which we should have understood much sooner. Apart from mentioning the danger of extension of human race due to the exaggerated effects of consumerism of the nature and the human beings themselves, he added, that if the world is to be saved, a better distribution of resources is needed to fight hunger and poverty all around the world. Academics have recognized that Cuba managed in a way to foresee, what the other countries will have to experience later.

Indeed,

"Cuba pre-empted what the other industrial countries will experience". (Wright, 2012)

[14] "The State protects the environment and natural resources. It recognizes the close links with sustainable economic and social development to make human life more rational and ensures survival , welfare and safety of current and future generations. It is up to the competent bodies to implement this policy." (free translation)

[15] Pronounced during the closing act of the closure of FAAM. Granma, 8 December 1981, p. 2. "20 years pass quickly(...) we are aware of the problems that await the world in the coming decades, in every sense; the growing population, which will reach more than 6,000 million; the problems of food, water, natural resources, pollution, problems of underdevelopment , these problems are projected into the future years for a large part of humanity (...) I really think that face these problems for man will represent a very serious challenge, and we firmly believe that our youth must be prepared to face this challenge" (free translation).

In other words, the decline in fossil fuels is inevitable even in the developed world and there is the possibility that other countries will experience, even though not in such an immediate and drastic way, what Cuba had to live through when the fuel imports were cut off. The industrialized countries and their petroleum-intensive agricultures in particular, will have to look for solutions and among these, alternatives.

C. The Cooperatives in Cuba

The new changes in the Cuban agricultural development, based on the law 295 "On the right to usufruct" and law 300 "About the delivery of idle state lands in usufruct", provide significant opportunities of a greater autonomy to the farmers in relation to the management of lands, as well as resources, and constitute a source of employment for a high number of people. The application of these two decrees have faced several great challenges that needed to be overcome in order to achieve an equitable level of economic and social development in the Cuban society.

The creation of cooperatives in Cuba was put in place in a context of planned economy, in times were Cuba was hit by the harsh economic crisis of the 1990s. The main change in terms of relations of production was a series of governmental policies that enhanced both individual and cooperative form of production. The significant transformation the individual and cooperative forms of production was achieved through the establishment of Basic Units of Cooperative Production in September 1993, created alongside already existing Cooperatives for Agricultural Production and Cooperatives for the Credits and Services (Álvarez, 2014) .

1. Law 259, the Right of Usufruct

In order to solve the problem of inefficiency of the agricultural sector following the shortage of chemical inputs and fuel, the first step undertaken by Cuban government and the principal strategy to increase the productivity was the introduction of a new legal instrument-*usufructo*- via the Law nr. 259. In this way, the unused and uncultivated pieces of land were given to the farmers and inefficient State farms were dismounted. Ministry of Agriculture provided support for the creation of around 2600 urban and suburban farms, and through the principle of usufruct around 3 millions hectares of unused lands were distributed (Funes and Altieri, 2012). Hence, the farmers were not forced to return all the production to the State but could start profiting from their efforts, and therefore were much more motivated.

The delivery of land via usufruct made that the farmers want to work on it. This measure increased relatively quickly the yields, although they had to fight bureaucratic obstacles whose removal was also part of the new governmental program. Giving land has been higher in the central and eastern provinces of the country than in the South, which is still one of the less developed regions of Cuba, namely the region of Cuba's first capital, Santiago de Cuba.

On May 17, 1959 when the First Agrarian Reform Law was signed, the land was given to those who worked and the latifundia that remained in the hands of the national oligarchy were eliminated. Through this law a principle stating that the land is for those who work it, was also implemented , by liquidating exploitation prevailing in the country since the times prior to the Revolution.

In the beginnings of the decade of the 1960, following the implementation of the first two agrarian reforms, small farmers began to organize and to coordinate the distribution of state inputs for agricultural production, material resources and the reception of the centralized credit.

Today, there are mainly 5 forms of ownership and land organization in Cuban organic agricultural system, divided according to the state or non-state ownership. The following cooperatives are currently put in place :

- State farms or *fincas estatales*
- Non-state farms:
    - Cooperatives of Credits and Services (CCS), or *Cooperativas de Créditos y Servicios*
    - Cooperatives of Agricultural Production (CPA), or *Cooperativas de Producción Agropecuaria*
    - Basic Units of Cooperative Production (UBPC), or *Unidades Básicas de Producción Cooperativa*
    - Independent farmers (Wright, 2012).

In 2012 a modification of the Decree 259 was implemented and a new law decree was put in place, the Decree 300, titled "About the delivery of idle state lands in usufruct". This new decree repeals the former decree of usufruct 259, opens the opportunity to extend the area granted to 67.10 hectares (five *caballerías*) for physical persons who - bound by the legal personality of a State farm, Basic Units of Cooperative production (UBPC) or Agricultural Production Cooperatives (CPA) - already possess land, remain in full production and meet their legal and contractual obligations.

Interestingly, cooperatives are based on the values of self-help, self-responsibility, democracy, equality, equity and solidarity. Following the tradition of its founders, members of the cooperatives believe in the ethical values of humanism, honesty, transparency, accountability and social vocation and they base their practices on the principle of knowledge-sharing.

Through the action of the cooperatives, the members have the opportunity to not only feed the local populations, but also to demonstrate the respect of fundamental human values through which they continue to support the existence of the cooperative movement itself. The cooperative principles are not legal rules, nor commandments; they are guidelines for evaluating the behavior and to guide the decision-making.

The idea of a cooperative represents a qualitatively new form of development of the production forces and can be seen as a continuation of the socialist ideology typical for Cuba. After more than three decades after the Revolution, a strong technical-material base was created in agricultural activity of Cuba. However, in the final years of the 1980s, the productive forces seemed to have slowed down, manifesting themselves through relatively low productive results, decreased productivity work and a continued deterioration of economic efficiency. An example of this inefficiency is shown in the results of the state enterprises in 1986, among which 39% showed satisfactory results and in 1990 only 29% maintained this condition, while the Agricultural Production Cooperatives had an increasing tendency toward efficiency, demonstrating depletion of the model applied in the agricultural sector model.

However, to be able to produce without agrochemicals, the first challenge to solve was the soil fertility. Of the 6.7 million hectares of the existing farmland in the country:

- 12 % to 60% of the land was affected by high or medium loss of fertility, the rest of the land with minimum levels, but still affected
- 14% was affected by salinity and sodium
- More than 46% of the land was touched by erosion and 27% by acidity.
- 30% of the land was damaged by flooding
- 54% by poor drainage
- and 64% by insufficient use of organic materials (Garcia and Perera, 1997)

To fill this gap, Cubans started to employ a variety of bio-fertilizers and soil improvements, including animal waste, cover crops, peat, quarried minerals, earthworm humus and nitrogen-fixing bacteria.

The Cooperative of Agricultural Production (CPA) are formed from the contributors to the landowners and from other remaining means of production, who decide on the *principle of voluntariness* to integrate the cooperative. In this way, the contributors sell the resources produced within the cooperative, they are paid for what they sell and become collective owners of the cooperative itself. More specifically, a CPA represents a collective form of social property and is created from the decision of farmers to unite their land and other means of production.

A CPA is defined as follows:

"La cooperativa de Producción Agropecuaria es una entidad económica que representa una forma avanzada y eficiente de producción socialista con patrimonio y personalidad jurídica propios, constituidas con las tierras y otros bienes aportados por los agricultores pequeños, a la cual se integran otras personas para lograr una producción agropecuaria sostenible."[16]
Chapter III, Art. 4, Law on Cooperatives of Agricultural Production and Credit and Services of 2002.

[16] The CPA is an economic entity that represents an advanced and efficient form of socialist production with its own assets and legal personality, formed with land and other assets shared by small farmers, to which other elements are integrated to achieve a sustainable agricultural production. (Free translation)

Interestingly, in accordance to what emerges out of this definition, we might notice that the idea of sustainable development was present in the Cuban agricultural policy-making already in the 1975,when the first CPAs were put in place, and this idea was conjugated with the idea of economic efficiency.

The Cooperatives of Credits and Services (CCS) also formed from the landowners themselves and other means of production, who also decide on the principle of voluntariness to integrate into the cooperative, but they do not sell their means of production, i.e. they remain individual owners and unite between themselves to obtain certain benefits regarding the assimilation of technologies, bank loans, best forms of marketing, and other benefits. If at any time they decide not to belong to the cooperative anymore and they withdraw , they will still continue to be individual owners of all means of production.

According to the definition included in the law number 95 of Cooperatives of Agricultural Production and Credit and Services of 2002, the same as the one where the rules surrounding the existence of a CPA are presented, we notice that the principle of voluntariness represents a characterizing feature of all cooperatives:

" una CCS es la asociación voluntaria de agricultores pequeños que tienen la propiedad o el usufructo de sus respectivas tierras y demás medios de producción, así como sobre la producción que obtienen. Es una forma de cooperación agraria mediante la cual se tramita y viabiliza la asistencia técnica, financiera y material que el Estado brinda para aumentar la producción de los agricultores pequeños y facilitar su comercialización. Tiene personalidad jurídica propia y responde de sus actos con su patrimonio."[17] Chapter II, Article 5, Law on Cooperatives of Agricultural Production and Credit and Services of 2002.

The CCS, whose members are peasants, maintain individual ownership of land, but are bound to pay for certain services and make transactions as loans and others. Today, there are around 2203 of these cooperatives in Cuba, with more than 150,000 members and they are considered to be the foundation for the organic, farmer-led revolution in Cuba. (Funes, 2010)

Among the main objectives of the CCS, similarly to the CPAs, can be found :

[17] The CCS is a voluntary association of small farmers who have ownership or usufruct of their land and other means of production as well as of the production they create. It is a form of agrarian cooperation through which a viable technical, financial and material assistance is transacted by the State in order to provide an increased production of small farmers and facilitate their market. It has a legal personality and responds to their actions with its heritage. (Free translation).

- to plan, hire, buy, sell and use in an organized and rational way the natural resources and resulting agricultural services to attain good levels of agricultural production.
- to manage, transact and collaborate in the control, use and recovery of bank credits provided by the State and necessary for its members and the cooperative itself for agricultural production
- to plan and manage the commercial directives of the members of the cooperative.
- to commercialize other productions and services authorized in its corporate purpose.
- to acquire, lease and operate in a collective way, agricultural and transport equipment and build the necessary measures to improve efficiency in agricultural production and marketing of its corporate purpose authorized facilities. (Chapter II, Article 5, Law on Cooperatives of Agricultural Production and Credit and Services of 2002)

However, after an initial process of development of the agricultural cooperatives in the 1970s, the cooperative movement was showing little development. Its real stabilization comes only at the beginning of the decade of the 1990, within the framework of economic reforms that the country was putting in place, in order to overcome the economic crisis which it was going at that time. It is in this period that the Cuban administration decides to initiate a process of transformation of the relations of production in the agricultural sector in order to facilitate the development of these productive forces. To that end, *UBPCs* represent the major innovation.

2. Emerging of the Basic Units of Cooperative Production

In the framework of economic crisis faced by Cuba in the 1990s, the Basic Units of Cooperative Production (UBPC) emerge as a new conception of the relations of production in the agricultural sector, whose basic principles were established by the agreements of 10 September 1993 promulgated by the State Council Law Decree number 142, which lays the foundation for the establishment and operation of the UBPCs.

The year 1993 is considered to have been one of the most difficult in the development of the Cuban economy and the agricultural sector was further exacerbated by the outcomes of the economic crisis. One of the strategies adopted to address this situation was the creation of

the UBPCs, which represented a major transformation of Cuban agriculture and is considered by many specialists in the field as *a Third Agrarian Reform Law*.

The law 142 attributed to the UBPCs a definition of "an economic and social organization, composed out of workers with a degree of management autonomy and administration of their resources, such as the piece of land they received and other property in usufruct for an indefinite period, giving them in this way the status of legal personality". Thus, by understanding which areas are the most fertile and prosperous, small farmers start to develop them by occupying a piece of land that originally belonged to the State, but since the introduction of the law of usufruct, these spaces could be exploited by an individual. These land spaces got also the name of *organopónicos* , their main characteristic being that they are surrounded by buildings and therefore represent a perfect example of urban gardening. Indeed, most of the agriculture in current Cuba is uniquely urban. (FAO, report 2006)

UBPC- Unidad Básica de Producción Cooperativa, basic unit of urban agricultural production, comes to existence when the Cuban State authorized the transformation of many state firms into small cooperatives functioning on a profit-share basis. This structural reform allowed the farmers that took the initiative to grow their own food in an available piece of land to enjoy the earnings from their work and at the same time the State did not need to give ownership of these lands to their users, but kept it itself . This right is a part of the law on *usufruct* for which Cuba became famous after the series of economic reforms that followed the Special Period.

The UBPC is designated as a part of production system that integrates constituting one of the primary links that make up the productive base of the national economy, whose main objectives are the sustained increase in quantity and quality of production, the rational use of resources and improving the living conditions of its members and of the general public.

In the agreements reached in 1993, it was established to gradually create such organizations, where the adequate conditions obtained from the former state enterprise allowed for it. The latter used to be characterized by possession of large areas and a high level of industrial resources employed per area. In this new cooperative form, the land is provided by the State to the collective, which elaborates the land under the conditions of use previously put in place in the former state enterprises and under the state ownership. Nonetheless, these collectives henceforth become collective owners, under conditions of indefinite usufruct

without payment of rent until the present. The rest of the means of production are also sold to this group that are produced within the UBPCs.

UBPCs are constituted under a set of basic principles:

- Linking the man to the area as a way of stimulating an interest in the work and a concrete sense of individual and collective responsibility
- Self-sufficiency of the collective partners and their family members due to a cooperated effort to progressively improve housing conditions and other aspects of attention to the man
- Associating workers income to the production achieved
- Widely develop the autonomy of management

As demonstrated by the finalities of the UBPCs, the production units must manage their resources and become self-sufficient in the production process. It is thanks to this autonomous process that the production is more profitable, because it is not influenced by the pressures of the needs of the planned economy. Moreover, the stimulus of the workers is increased.

However there is still a significant room for improvement. The following factors, that generally affect economic efficiency and in particular the further development of the sector, have been identified by Fernando Funes, as demonstrating a need of eradication:

- Low and poor application of science and technology in terms of production and
- Improvement of marketing aspects , that currently do not meet the demands of the sectors
- Insufficient diversification of production
- Low levels of agricultural output
- Scarce liberation of the forces of production
- Lack of adequate promotional strategies
- Low level of competitiveness of the products in the foreign markets
- Rigidity and lack of autonomy in the pricing policy
- Internal financial imbalance
- Insufficient specialized services to customers

The creation of UBPCs represented a solution to the food crisis and hardships faced during the Special Period. The UBPCs work on based on a strong human factor. Indeed, the

neighbors from the community work for the entire community. In the beginning there was a low level of experience and therefore the yield were low as well. Within ten years the UBPCs cooperatives converted into an important source of income for a community, employment and a source of healthy organic food for the population.

The way a UBPC functions is unique. During the plantation and cultivation phase, there is a strict interdiction of using chemicals. Further, the harvest times are very intense, with the planting part happening in the evenings, and the picking phase in the mornings. The result of these long efforts is translated into products that are sold at much lower prices that the products issued using chemical fertilizers. Unlike in the developed countries, organic products issued from this kind of agricultural production in Cuba are much cheaper then the ones farmed conventionally, using chemicals.

It is therefore fundamental to consider the social aspect of the *organopónicos*- they provide fresh and cheap products, bring employment and improve the overall appearance of the decayed urban areas. Such cooperatives represent an example for the future generations, not only in Cuba. As Peter Rosset put it :

"All people interested in developing food systems that are socially just, environmentally sustainable and economically viable, should pay close attention to Cuba."

Today, Cuba has more than 7000 functioning urban gardens. 8% of the land in Havana is used to supply its citizens with over 90 % of their fruit and vegetables. In the contrary, 95% of fruits and 50% of vegetables eaten in the industrial world are imported, despite having sufficient lands to produce them.

Cuba has learnt a lesson from the past and thus became sustainable. By applying ancient agricultural techniques, it found an alternative for its poor economy and for its environment. In the field of agriculture, for sustainability is intended a kind of agriculture that gives the possibility to feed and clothe the entire population at a reasonable cost, by offering an acceptable level of the living standards for all those who depend on this sector and decrease the use of natural resources in such a way that does not harm the natural environment (Funes, 2001).

Through the introduction of UBPCs and cooperative urban form of farming in general, Cuba is reaching its objective of a *total sustainability*. Indeed, Cuba's alternative agricultural production system is in symphony with the environment and is recognized for its ecological, biological, organic, natural and biodynamic aspects. In addition, the idea of the undeniable sustainability is closely linked to the techniques they utilize, which are not costly as could be expected.

Moreover, sustainable agriculture refers also to all agricultural practices with an emphasis on the environment, practices that ensure sustainability of land use for all the future generations. To this end, raising individual and collective consciousness of the human being, in relation to its economic prosperity and trying to stabilize and increase productivity is a necessary condition. Moreover, all this contributes to maintaining the ecological balance, in order to improve the global awareness not only of the farmers, but of all the consumers.

In 2011, with a process of institutional change started to take place following the mandate taken by Raul Castro. These changes deeply affect the economic model previously existing in order to diminish Cuban international isolation . Structural and managerial transformations are needed to improve Cuban international profile. From the perspective of recent happenings, a memorandum of understanding (MOU) was signed between United States Department of Agriculture and Cuban Ministry for Agriculture, as a part of several measures announced by barack Obama in the view of fostering bilateral collaboration (MOU, 2016). This memorandum aims concretely at challenging the agricultural marketing in Cuba and enhancing major research collaboration with the USA.

Moreover, different companies trading organic food expressed their official willingness to import product from Cuba. These two steps officialize an ongoing and unstoppable opening of Cuba towards the USA in the agricultural field and vice versa. Today all these elements together result in a unique combination of processes that Cuba is pushing forward in terms ecological food production that can be of inspiration for the current and future global trends in agriculture.

C. Urban farming in Cuba

With the rapid growth of the cities in the world within a bigger context of urbanization, both in the developed and developing world, growing fresh and varied vegetables in the metropolis, becomes a challenge that is being attained by the means of urban agriculture. It is an environmentally friendly strategy that ensures that the population has access to high quality nutritious food.

According to the experience of other countries with the organic production systems, it has been demonstrated that there are three stages of development in most cases:

- In the first stage, the sector is developed through the efforts of the producers, in other words, farmers.
- In the second stage, civil society is mobilized, by acquiring an increasing awareness of the importance of organic products through their direct relation to aspects like health, environment, taste and freshness of food.
- The third stage is marked by State intervention in this type of agriculture, because it does not only represent the interests of consumers, but it also affects the multifunctional role of agriculture -landscape, ecotourism, improving the income of rural families and other elements. (Castellón, 2003).

Cuban case has followed this path too. Notably, the urban agricultural movement starts with peasants, is received by the local populations and significantly supported by the State.

The Cuban experience with the urban form of agricultural production originated long before the Special Period, when Cuban agriculture possessed thousands of tractors for land cultivation, but with the collapse of the USSR, Cuba lost its largest partner and its main source of supply of oil and chemical products.

Intensive production of vegetables in Havana began in the nineteenth century, when Chinese immigrants settled in the outskirts of the city. But the foundations of what is now a thriving movement of urban and peri-urban agriculture can be placed in an exact date: the 27 December 1987, when the the Communist Party of Cuba took action to convert production plant with technology known as *organopónico*.

After the collapse of the Socialist camp, one of the measures that the State adopted was to intensify the work and it is in this way that the movement of the urban agriculture arises, as a strong agricultural movement in the cities and settlements that has among its goals a greater production of diverse, fresh and healthy foods available areas, initially unproductive.

Following the introduction of the Second Agrarian Reform Law of 1963, a significant number peasants moved to the cities. By 1994, a spontaneous decentralized movement of urban residents joined a planned government strategy to create over 8,000 city farms in Havana (Murphy, 1999). These are the beginnings of urban agriculture in Cuba.

The urban form of gardening represented since the outcome of the national food crisis in the 1990s an immediate solution for the provision of fresh food and vegetables. Initially, high yields could not be achieved due to lack of inputs and agricultural experience. However, with a strong governmental support, urban agriculture quickly went from being a spontaneous response to food insecurity to be a national priority. During this process, Havana has added a new word to the vocabulary of agriculture -*organopónicos*- meaning "urban organic farms" and has become a pioneer in the global transition towards sustainable agriculture that produces "more with less". The growth of urban agriculture is largely due to the Cuban state's commitment to making unused urban and suburban land and resources available to aspiring urban farmers (Murphy, 1999).

In the beginning of the Special Period, organoponic orchards proved suitable for growing plants on poor soils of small urban spaces. A typical garden of organopónico starts by opening grooves and later envelops the land in wood, stone, brick or concrete. Through these practices,the soil quality gradually improves by applying organic material. Moreover, by increasing the organic content of the land, levels of soil nutrients and moisture also increase.

The "*organoponia"* is a Cuban invention and an ancient technology at the same time. The term was coined to distinguish this system from other types of intensive and high performing horticultural production, such as *hydroponics*, which consists in growing plants above straits of water and inert substrates, which are enriched with mineral nutrients.

However, from the point of view of the technology it uses, organoponia is a derivate of hydroponics. It is also know under the name of *geoponics*. It designates a technology, mainly used in urban agriculture, seeks to develop another kind of environmental management- using recycled materials such as plastic base plates, bottles, bags. It uses

organic food waste, which once it is processed, becomes a natural substrate that plants requiring for their development. It involves the application of a model of high-tech greenhouse miniature that can cultivate completely natural products without the use of chemical components. The term organopónico applies both to technology and to the orchard. It can be created on undeveloped/uncultivated areas, on vacant lots and on roadsides, and can be also arranged in terraces on hillsides. The soil can be prepared to suit each crop, using the most suitable, organic mixtures. If necessary, the orchards can be dismantled and relocated. This method involves placing solid substrates that are able to satisfy nutritional requirements necessary for the development of a plant. Apart from Cuba, it is practiced with great success in different regions of the world, because of its ability to reap great variety of vegetables and other crops throughout the year because it is not affected by the state of the weather. It is grown in controlled and protected environments, providing pest and disease free healthy plant foods.

Although urban farmers in Havana have used hydroponics in the past (Avila, 2008), this technology depends on a reliable supply of chemical inputs. Cubans gave their name organopónicos for the ecologic alternative solution based on organic substrate, obtained from crop residues, household waste and animal manure. The holistic approach to agriculture in Havana, and Cuba as a whole, is based on the need to obtain high yields with minimal use of external inputs, especially agricultural chemicals derived from fossil fuels. It is said that Cuba was the first country that has experienced a crisis of "peak oil" which will end up affecting food production worldwide.

The main contribution of urban organic farms was not only to find a solution to the food issue during the Special Period, but especially to change the eating habits of the Cubans. The former common Cuban diet consisted essentially of meat and rice, whereas after the introduction of urban farming, the Cuban diet is changing, and includes now fresh fruits and vegetables (Benjamin, 1984). Organic urban farms are completely modifying the way the Cuban people think about food and agriculture itself, with farming becoming a well-respected career and providing a greater awareness of healthy eating habits.

Apart from changing the eating habits of Cubans, the results of the implementation of urban agricultural practices currently include the creation of individual urban gardens, state-hold research spaces for the purposes of agro-economic investigation and popular greenhouses employing around 25 000 urban farmers , which contribute to the food supply of the whole country (Funes, 2012).

In order to illustrate the activities of Cuban urban farmers, I will use one of the most famous and impressive examples of *organopónicos* in Havana, the *Organopónico Vivero Alamar*, an urban situated in the suburbs of the capital, in the neighborhood called Alamar. It was created out of 4 people in 1997 at a total surface of 800m2, as a popular movement to produce food in the city, both to feed own families or for business purposes. One of its founders, Miguel Salcines, used to work as agronomist for the Ministry of Agriculture. It initiated as a group producing basically vegetables and later on the food production and diversity was increased. Besides growing vegetables, they started to grow medicinal plants, ornamental plants and livestock feed as well as value-added agricultural products. Slowly their production methods were improved and now it provides the food supply for the whole community of around 100 000 inhabitants. 90% of the food they grow and of the livestock is sold to feed the community. The principal strength of this cooperative stays in the human resources that it has at its disposal. 22 college professors and 15 agricultural institutions with an average of 40 technicians are officially part of Vivero Alamar, which beyond being a conjugation of sacrifice, passion and enthusiasm, is a highly technical and intelligent cultural institution that provides guaranteed results. Organoponico Vivero Alamar has become one of the most well-known urban farms, starting as a vegetable garden and currently employing over 160 people (Alamar Vivero website).

Cuban urban agriculture has achieved a remarkable success. There are 380 000 urban farms, covering a total surface of around 50 000 hectares of land, previously unused, and producing the supply of 70% of fresh fruits and vegetables for the main Cuban cities (Funes and Altieri, 2012). Urban agriculture is an effective solution to increase the diversity of agricultural products to the population, and includes not only plants, but also livestock breeding, aquaculture and production of bio-fertilizers from vermicompost. The production is based on organic practices, which do not pollute the environment, the rational use of resources of each region and territory and direct marketing to the consumer.

Moreover, the organic products are more and more beginning to be cultivated for export purposes. The production and marketing of organic products in the country is in its preliminary stages, concretely in the phase of creating the conditions and rising production potential, to be able to export the production surplus. However, current exports of organic products are already promising, as illustrated in Figure 8, that I calculated based on the data obtained from the Ministry of Agriculture in Cuba.

Products	Surface (ha)	Production (ton)	Export (ton)
Coffee	5274	110	69
Cocoa	1526	155	155
Honey	137121	725	50
Sugar	2456	5000	950

Figure 8: Production and export of organic food in 2015. Based on data obtained via the Ministry of Agriculture, Havana, Cuba.

In conclusion to this chapter it can be said, that the cooperatives in Cuba have without doubts contributed to raise the living standards of Cuban families. Firstly, by enabling to make profit out of previously unused pieces of land and secondly, by easing the access to food on a local scale, and therefore feeding a significant amount of people, locally.

However, there is still a room for improvement for the perspectives of Cuban organic agriculture. Today the results are that the Cuban farmers are producing most of their food supply without agrochemicals. Diversification of the production has been improved in recent years within the sectors like fruits and vegetables. In Cuba many tropical fruits can be found, like pineapple, guava, sugar apple, mamey, papaya, etc. Most of the agricultural production in Cuba, around 60%, is done by private farmers and cooperatives. Today's agricultural production in Cuba is concerned, as never before, with food self-sufficiency and environmental protection (Funes, 2012). But in order to fully implement these ideas, a lot of political will is still needed.

The current debate on global warming is specifically related to its significant consequences on climate change, with serious outcomes for agricultural productivity. In Cuba, this can result into an increased incidence of meteorological phenomena of great intensity, as demonstrated by the hurricanes Gustavo and Ike, both in 2008. Cubans believe that organic agriculture will lead in Cuba to a total sustainability and that the organic success of today and will ensure an environmental guarantee for tomorrow.

IV. Sustainability and Organic Agriculture

This chapter deals with the discourse about sustainability, which is currently not only a part of the international agenda of development, but also one of the dimensions and challenges for the agricultural world. Firstly, some general notions of sustainability will be presented, in order to analyze why has this concept been so much discussed everywhere lately. Secondly, the relation between sustainability and agriculture has a great deal of importance for the purposes of the research. In this context, we will see that agriculture is not only a fundamental part of the discourse on sustainable development, but has been since the beginning present in the theories of development. Thirdly, a brief focus on the concepts of food security and food sovereignty will follow, as characteristic for all talks on sustainable food systems. Taking into account all these elements, a series of policy proposals will be examined to understand how a State can enhance sustainable development by creating appropriate public policy. Finally, all this general theoretical framework will help us to understand whether and to what extent is Cuba a sustainable society.

A. General Notions of Sustainable Development

Sustainable development was defined for the first time by the Brundtland Commission - World Commission on Environment and Development - in 1987 as a sort of "development which meets the needs of current generations without compromising the ability of future generations to meet their own needs". This concept effectively summarized existing ideas about sustainability. As Hediger correctly put it, this definition of sustainable development is based on an ethical imperative of equity within and between generations (Hediger, 2000). Apart from being an ethical imperative, sustainable development is strictly related to the necessities and challenges faced by the Earth. It implies that our generation listens to them, and acts respecting its needs, in order to leave a contribution for the future generations and enable them to conduct a good life, or even better. This means, among other things, another way of thinking in terms of the use of natural resources, technologies and energies. It is not only a challenge in terms of creating a new perspective for a different normative thinking, in other words, what is better for our society; the real challenge is to create a framework conjugating social, ecological and economic objectives with a concrete set of means and solutions.

Another definition of a sustainable development was provided by the American economist Herman Daly, expert of ecological economics. This scholar proposed that a sustainable society is one in which:

- resources should not be used at a higher rate than their rhythm of regeneration,
- pollutants should not be emitted at a higher rate at which the natural system is able to absorb or neutralize,
- nonrenewable resources should be used at a rate lower than the human capital created to replace the lost natural capital.

This definition should be also related to the specific case of fossil fuels, meaning that the part of the energy released to create systems of energy saving or systems to use renewable energy , should be used to provide the same amount of energy as the the fossil fuel consumed for the creation of those (Daly, 1994).

In general, there are three ways to define sustainable development. The first is the simplest, surely the one that has been more successful, while in the second and third, the reasoning is much more complicated. However, it has to be kept in mind that what is provided above is a strategic definition of a conceptual and globalizing character, and a notable difficulty occurs when translated to daily practice, to the single public policies of the States. There is definitely a need of an important effort to overcome the practical and administrative difficulties posed by the ecological principle of thinking globally and acting locally.

The concept of sustainability gave birth to various approaches in the scholar literature, despite the fact that they all turn around the idea of intergenerational equity as essential condition to discuss sustainability. First of all, it is a normative concept, as Hediger reminded, since it involves trade-offs among social, ecological and economic objectives, and is required to sustain the integrity of the overall system (Hediger, 2000). It is strictly relied to the concepts of social welfare, intergenerational equity and ecological economics. Sustainable development can also become a pragmatic objective to enable the present generation to build their general welfare based on their human needs and engage responsibly in ensuring the development of human potential and therefore make it endure and pass on to future generations.

The concept of sustainable development could be used to argue in different directions and touch upon the approaches to the welfare itself, however it would be naive to believe that awareness of the term welfare is reduced to intergenerational equity, an aspect on which Dr. Andrés Yurjevic believes that "there should be a process of psycho-socio-biological evolution that would allow that the human economy does not exceed the tolerance limits of the geophysical biosphere" (Yurjevic, 1995).

Consistently with what mentioned above, the States willing to achieve sustainability should be guided by the principle that expresses the will of a State as a permanent guarantee for the common good. It emerges as an indispensable element to create regulations and incentives, but if treated on a macro level, i.e on a universal scale, and considering that in the coming decades the world's population will reach numbers of 8-11 billion people, then the risk is more serious and a question arises as how to achieve international standardization. This represents as an impossible parallel to the globally increasing poverty. It is not necessary, in this context, to focus our vision only on social inequality in extreme conditions, basing the arguments on human dissatisfaction or personal frustration almost widespread and resulting in an overwhelming existential pessimism related to the gradual deterioration of the natural environment. However, this is precisely the basis on which the idea of sustainable development is encouraged, yet nevertheless interesting conceptual aspects of sustainability have developed, that are authentic ideas related to the content and the perception of welfare.

These ideas on *welfare* in the context of sustainability have been developed mainly in a double direction:

- *Human Development* - which emerged and developed on the basis of seeking welfare and personal fulfillment in an aggressive environment where the imbalances are widespread. This approach is based on the idea that the center of all development should be human being and, therefore, the object of development is to expand opportunities for individuals. This results in areas such as access to income, not as an end but as a means to acquire welfare; prolonged life, knowledge, political freedom, personal security, community participation, the guarantee of human rights.

- *Ecological Economics* - a stream of economic thought with important theoretical influence today. The main feature is its interdisciplinary nature, derived from the need to study the relationship between natural ecosystems and economic system, which requires the

participation of not only economists, but also of natural scientists and other disciplines. This stream can be perceived as a reaction to the decadent effect of the economy in developing countries has allowed to create anthropocentric, biocentric and co-evolutionists relations between man and nature.

These approaches challenge the Brundtland Report that proclaims that the population growth quintupled without damaging the biosphere, ignoring the fact that already when the exponential growth of the populations doubles, the assimilative capacity of the natural environment is exceeded (Bruntland, 1987)

Therefore, the only definition that gives meaning to sustainability and is also its common denominator, is the preservation and recovery of the natural assets and resources, basic elements to ensure the continuity of the so-called "ecological services" to an expanding global population. Only from this perspective it can be seen as a reasonable key to sustainability: the need to guarantee future generations the same natural assets inherited by the present generation.

The irreversible artificiality of the natural system is the most important consequence of human intervention exerted throughout history. Interventions in these systems are often necessary to preserve them, since human efforts to adapt the natural system to series of global socio-economic requirements have highly fact-dependent inputs that the economic system is able to provide in the form of fertilizers, water, pesticides or some type of biological control, genetic varieties and, in general, any form of energy subsidy.

The inability of mankind to live in harmony with the planet and the great interaction between man and the natural system are both elements that underline how certain environmental problems are of a big importance today. To this day, no species except man, has managed to change so substantially in such a short time, the characteristics of the planet.

Thus, following global problems arise related to the above-mentioned elements:

- Overpopulation and inequalities
- The greenhouse effect
- Ozone layer destruction
- Humanization of the landscape

- Preservation of biodiversity
- Erosion, desertification and forest destruction

And at the local level:

- The agricultural production system is in crisis
- Water quality and availability
- Household waste
- Lack of energy supply
- Deficiencies of the transport system

Food systems and agricultural production are faced by these global challenges in the major extent, because these are the fields that will have to provide the right to food for the newly increased populations and that will experience the lack of energy supplies, water availability and will produce waste that will not be absorbed.

B. Theories of Development : Sustainability and Cuba

Apart from the very famous Brundtland Report, it is necessary to analyze how the theories of development have framed the issue of sustainability, and more specifically sustainable agriculture.

Agriculture has always been present in the discourse on sustainable development and in the theories of development (Van Bilzen G., 2015). The food issue as a concern at a global level was already introduced in 1972 in a famous report by the Club of Rome, *The limits to growth*. This controversial, but important report reminded of some significant limitations in terms of the unstoppable growth that the Earth was going towards. Among other things, it stated that it would be impossible for the population, food production, industrialization, the exploitation of natural resources and pollution of the environment to continue to experience exponential growth without sooner or later collapsing (Colombo, 2000).

According to the theories of development, namely, theories of modernization, underdevelopment of a developing country can be seen as a sort of delay that has to be caught up, and is not desirable. Therefore, the theories of modernization purpose to put in place such policies that would enable the societies to change through the use of means that help a country

to evolve, catch the delay up, since this process is something unstoppable. Indeed, according to these theories, a State has to pursue policies that support introduction of modern technologies, improving of the education system and health system.

Critical approaches, in contrast, aim to change the structure of the developing societies. Among these, the radical approach introduces the Neo-Marxist idea of the strong role for the State in seeking the prosperity of a society. Moreover, this approach gives preference to the so called correct kind of development, which puts in place policies of distribution of income and resources, controlling the consumption, instead of only focusing on the economic growth.

It is challenging to analyse Cuba from the point of view of the theories of development. With 19 % of the population working in the sector of agriculture and 70% living in the urbanized areas, one might think that Cuba is following a traditional path of a developing country, because the fact that the Cuban population is moving from rural to urban is a general tendency in most developing countries in the last decades. As a general rule, however, it has to be assumed that the development in Cuba was made possible thanks to the strong role that the State has occupied since the beginning of the Revolution. Indeed, the doubt might arise on whether it is the Theory of Dependence or the Theory of Modernization, that best fits the Cuban case, the former being a part of the latter, with its own specificities. The Theory of Dependence was born in Latin America and was inspired to Neo-Marxist ideas. However, it placed the economic dependency of a developing country on the Global North, which was not the case of Cuba, given that its only trading partner was the USSR and could not even receive the aid of the World Bank or IMF- institutions that require a country to be a democracy in order to receive their aid and investments. Similarly, The Theories of Modernization, whose accent on development is conjugated as something inevitable, presented the example of Western developed countries as the model of development, not taking into account the specificities of a tropical country, like Cuba, in terms of its natural resources, culture and mentality.

However, from the point of view of the theories of development, the most fitting theory for the purposes of this research , and in relation to the Cuban case, is the theory of Gunnar Myrdal, who studied the issue of the State-developer. The role of the State in Cuba is immensely strong, and as this Swedish economist suggested, its main objective is to redistribute its richnesses, especially in the agricultural field- in other words- the lands. He has demonstrated the strong role of the State in the process of development of a country on the example of Asian countries, where the State put in place strict policies to enable their

rapid economic growth. When translated to the Cuban reality, it is exactly what has been put in place in Cuba after the Revolution, when the two agrarian reforms provided the land to the farmers. In this way, the State ensured a major development of the agricultural sector, and represented also a step towards economic growth , since the farmers could start profiting from their yields instead of leaving the lands unused or returning all the yield to the State.

As Funes explained:

"Food crops produced in excess of these quotas could be freely sold at farmers markets, thereby providing a price incentive for farmers to effectively use new organic technologies such as biofertilisers, earthworms, compost and the integration of grazing animals. Farmers also revived traditional techniques such as intercropping and manuring in order to increase production yields."

(Funes et al., 2008)

This shows clearly that the role of the State was crucial for Cuban development. By putting in place the agrarian reforms, the State managed to provide economic benefit to its farmers and enable a further economic growth of the island. Moreover, sustainable agriculture was achieved. Myrdal himself also focused on the idea of the reform of agriculture as well as on the idea of a free education, which gives the chance to everyone to rebalance its opportunities of a success within a society. Indeed, in Cuba, the educational system is one of the most advanced one in the developing world, and *ça va sans dire*, its free.

C. Sustainability in Agriculture

According to the current trends in global development, the world fertility rate is decreasing, but the global population will continue to grow (World Bank, 2014). According to the FAO forecasts, there will by an increase of 30% in the global population over the next 35 years (FAO, 2014). This increase will mainly happen in the developing world. The population will be especially living in urban areas. How can this be sustainable for the planet is the main question that concerns policy makers.

In the above context of the changing face of our planet, organic agriculture occupies a fundamental place, because it is not only interested in the final product that reaches the consumer, but aims at reaching a more elevated, global objective, strictly related to the challenges faced by the planet.

According to the FAO, the global food system needs to reduce its dependence on fossil fuels, if aiming at meeting the growing needs of the population. The food sector, including manufacturing inputs, production, processing, transportation, marketing and consumption, involves about 30% of global energy consumption and generates more than 20% of total global emissions of greenhouse gases (FAO, 2011). The changes in agricultural practices, the use of local and renewable sources for energy throughout the production chain and the use of waste for energy production, contribute to achieving the goals of sustainable development.

Sustainability is, in this view, only one of the properties or criteria to measure agricultural performance, the others being productivity, stability and equity (Kluson, 2009). The first is defined as the value of output per unit of input resource. Stability refers to the constancy of productivity over time against fluctuations and normal cycles of the environment. Finally, equity is the fair distribution of agricultural productivity among the social beneficiaries.

Efforts to reach an operational concept of sustainable development have been advanced in the field of agriculture. In such a perspective, sustainability refers to the need to minimize the degradation of agricultural lands and, in turn, to maximize production. It means considering all the agricultural activities, such as soil and water management, crop selection and biodiversity conservation in their interrelatedness and considering at the same time, the goal of adequate supply of food and raw materials for the whole population. In this context, sustainability refers to the ability of a system to maintain its productivity despite higher both economic and natural, external or internal, or even relatively minor but continuous and cumulative disturbances. In this definition, sustainability is a function of the natural characteristics of the system and of the intervening human actions, as well as other social, economic and technical impacts that are made to counteract negative tendencies of a natural system.

FAO, Food and Agriculture Organization of the United Nations, has always been at the forefront of the work on sustainable agriculture, by creating policies, inventing concepts , signing treaties, implementing policies, strategies and programs for sustainable development in food and agriculture (FAO, 2016).

It defines sustainable development as follows :

"management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development (in the agriculture, forestry and fisheries sectors) conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable".

(FAO Council, 1989)

What results is that the main objective of sustainable agriculture is to maintain agricultural production to levels that meet the needs and aspirations of a population expansion without degrading the natural environment

Within these dimensions, interpretations that focus on natural processes, productivity of ecosystems and the link between sustainability and preservation of biodiversity are favored. This approach is not new, its antecedents can be found in the debate on the exploitation of natural resources, including fisheries and forestry that can be considered, *ceteris paribus*, naturally self-renewing. However, despite is not new nature, it is fundamental to underline this aspect because only by preserving the natural functioning of the natural processes, one can claim to contribute for the sustainability of an ecosystem. This has to be kept in mind, when choosing the agricultural polices. The conventional ones, using industrial products and chemical fertilizers to reach high crops for the purposes of sale, do not take into account the aspect of self-renewal of an ecosystem and clearly damage it. Whereas the organic methods use nature-friendly products and the crops are not produced for the export purposes but for the satisfaction of the nutritional needs of a given population.

In the management of biological resources, the concept of maximum sustainable yield or harvest, has been used to define such a management that ensures a maximal and continuous production, compatible with the maintenance of a minimum reserve required to its permanent renewability.

However, in both cases the concept is difficult to translate into policy terms and into concrete operational tools, such as policy planning and control management. Regarding forest resources, the maximum sustainable yield would refer to the harvest in which cutting and

replacement rates are equal in a given area and for a given period of time. However, it is a fact that such equalization rate, both in the biological resources management and for the forest resources, is not necessarily a guarantee of sustainability. There is a temporal dimension that must be considered in the match between logging and replacement, as the replacement takes time to reach a harvestable size and during that time is exposed to loss or degradation. As with any biological resource, the variability of natural elements plays an important role, including in this climate change, temperature, humidity, the occurrence of pests and diseases or the simple fact that it is likely that logging affects the structure soils and easily remove and nutrient loss.

However, today there is no consensual definition of sustainable agriculture, because the concept varies from organization to organization, from scholar to scholar. Among the many definitions, I find the one proposed by the National Sustainable Agriculture Information Service as straightforward, as it cites the following: "Sustainable agriculture is one that produces abundant food without depleting the earth's resources or polluting its environment. It is agriculture that follows the principles of nature to form systems for raising crops and livestock that are, like nature, self-sustaining. Sustainable agriculture is also the agriculture of social values, one whose success is indistinguishable from vibrant rural communities, rich lives for families on the farm, and wholesome food for everyone." It is a kind of agriculture that finds a good balance between the need of production and the observation of the ecological system. The components of sustainable agriculture are of economic, ecological and social nature. Therefore, in most definitions the following elements can be found:

- Improvement and preservation of soil fertility and productivity management strategies through the use of low-cost inputs).
- The satisfaction of human needs.
- The economic viability.
- Social equity and improving the quality of life for farmers and society.
- Minimization of impacts, protection and improvement of the environment.
- The durability of the system in the long term rather than short-term profitability.
- That is, sustainable agriculture must encompass economic, social and environmental dimensions.

(FAO and National Sustainable Agriculture Coalition)

The concept is not confined to the ecological factors of agriculture, but includes also economic, technological practices of resource use and social dimensions. Sustainability is defined both in relation to the natural system, as well as the socioeconomic one, which allows the explicit incorporation of technological change in the conceptual framework. As Baldwin Cheryl suggested, the need of a sustainable food system should be a concern of every human being, not just in the developing world, because the current state of our food industry and of our eating habits will have an important impact on what we leave to the generations that will come after:

Food supply chain affects every human being on the planet. Therefore, it has to be sustainable. The food supply chain, called also as food industry and food system, include aspects from production of the food, processing, distribution, consumer purchase, consumer use and end of life. A sustainable food system means that the food is produced and consumed in a way that supports the well-being of the other generations.

(Baldwin, Cheryl J., ed. Sustainability in the food industry. John Wiley & Sons, 2011).

Nonetheless, some aspects are controversial. One position states that the modernization of agriculture increases environmental possibilities, improves nature and, to some extent, makes it less unstable (Altieri, 1999). Others, however, argue that the degradation of agricultural land and the increasing erosion of biodiversity is reducing the resilience of the natural system and, therefore, its sustainability, thereby increasing socio-economic vulnerability by relying human activity of a declining basis of species (Costanza et al., 1991).

Organic farming represents an important model for sustainable agriculture, since it relies on a production system that has the ability to maintain a high level of productivity and be useful for the society in the long term, meeting the requirements of an adequate supply of food at reasonable prices and be profitable enough to compete with the conventional agriculture, which is based on the use of non-renewable, chemical inputs. Organic farming can also serve as the ecological preserve for the productive potential of natural resources. This model of farming used to be a fashion trend in the past. Today it is developing from a theoretical concept to a fully established practice. Farmers reduce their dependence on externally produced agrochemical inputs and the whole system of agricultural production is redesigned (Funes in Gliessman et al., 2009).

As Fernando Funes brilliantly put it, "an increased awareness of the benefits of organic farming completed with a deeper understanding of the detrimental environmental impact of conventional farming practices resulted in an increased demand for organic food worldwide" (Gliessman et al., 2009).

D. Food Security and Food Sovereignty

These two notions are insurmountable in any discussion on sustainability, food systems in general, and for the food issue in Cuba. Despite their relatedness, there are some fundamental differences between the two. Farmer organizations, NGOs and civil society organizations are putting in place strategies to eradicate the problem of extreme hunger and malnutrition. Their focus of interest is put on a concrete policy framework that we can name with the term of Food Sovereignty. Moreover, two other terms are being used in this context, and thus Food Security and Right to Food.

In this context, it is necessary to point out the existence of an organization that involves around 69 countries from all around the world with the aim to gather farmer peasant families to share their problems and perspectives. *La Via Campesina,* apart from promoting the goal of sustainable agriculture, have become known for having coined the term of *food sovereignty*, which is now being used worldwide.

Food sovereignty has been defined by La Via Campesina as follows:

"the right of peoples to healthy and culturally appropriate food produced through sustainable methods and their right to define their own food and agriculture systems."
La Via Campesina, 1996

The discourse on Food Sovereignty made them gain the official support of FAO as it represents today an area of common interest for both organizations (FAO, 2013). Moreover, FAO, has always been at the forefront of the work on sustainability in the agricultural sphere (FAO, 2016). La Via Campesina was created in a context of a global extension of the objectives of the international development agenda, putting at its forefront, in the 1990s, social and economic rights alongside to already existing political and civil rights.

According to the promoters of the concept of food sovereignty, farmers are losing power of decision over their resources which leads the sustainable food system into crisis.

Increasing deficit of oil inputs for the production will continue to affect food prices and what will be therefore required are alternative food systems based on local farming, which respect both direct and indirect energy consumption (Scialabba, 2002).

The latest FAO figures show that the positive trends in the reduction of the number of the hungry and malnourished people that were reported for the first half of the 1990s have reversed: between 1995 and 2005 the number of chronically hungry in developing countries increased at a rate of almost 5 million per year – from 800 million to 852 million. (FAO report, 2012).

Food security, compared to the right to food and food sovereignty, represents a wider goal. The World Health Organization defined it as follows :

"when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life" (WHO, 1996).

According to the WHO, this concept is based on three pillars: access to food, food availability and its use. It represents a complex sustainable development issues and is interdisciplinary: its focus goes from health, to development economics up to environment. Most importantly, this concepts has underlined the idea that currently there is enough food averrable to nourish the whole global population, the main problem being its distribution.

Whereas right to food is a fundamental human right, it does not represent, and the concept of food security either, a defined set of policies to be applied. This is the main difficulty for the realization of this basic human right, hence no legal obligation of the States to take it into account. States can decide independently about the inclusion of these fundamental principles into their public policy making.

However, food sovereignty is a precise policy proposal (Windfuhr et al., 2005). Among its objectives can be found:

- *priority of local agricultural production to feed people locally;*
- *access of smallholder farmers, pastoralists, fisherfolk and landless people to land, water, seeds and livestock breeds and credit. Hence the need for land reform; for the fight against GMOs and patents on seeds, livestock breeds and genes; for free*

access to seeds and livestock breeds by smallholder farmers and pastoralists and for safeguarding water as a public good to be distributed equi- tably and sustainably used; and for secure access to fishing grounds by artisanal fisherfolk;

- *the right to food;*
- *the right of smallholder farmers to produce food and a recognition of Farmers Rights;*
- *the right of consumers to decide what they consume, and how and by whom it is produced;*
- *the right of countries to protect themselves from under-priced agricultural and food imports;*
- *the need for agricultural prices to be linked to production costs and to stop all forms of dumping. Countries or unions of states are entitled to impose taxes on excessively cheap imports, if they commit themselves to using sustainable pro- duction methods and if they control production in their internal markets to avoid structural surpluses (supply management);*
- *the populations' participation in agricultural policy decision-making;*
- *the recognition of the rights of women farmers who play a major role in agricultural production in general and in food production in particular;*
- *agroecology as a way not only to produce food but also to achieve sustainable livelihoods, living landscapes and environmental integrity.*

(Claeys et al., 2014).

From the point of view of the Cuban situation, many of the above mentioned objectives are currently being put in place. Thanks to the work of ANAP- *Asociación Nacional de Agricultores Pequeños* (National Association of Small Farmers)- who make part of the global movement of La Via Campesina. Urban farming contributes to improving population's right to food and feed locally. Their work aims at guaranteeing the sustainability of Cuban peasant agriculture, among other social benefits, through the stability of the working means and through their the use, in other words,: legal possession of the land and other assets, access to credit and markets, insurance protection agricultural and social security (Alvarez, 2001).

In this framework, the ANAP has developed an agro-ecological program, which is based on the fact that before the economic crisis that has affected Cuba in the recent years, farmers have contributed significantly to food the people, have maintained and increased their

productive contribution and are undoubtedly an example of subsistence in a model of sustainability of natural resources that is well worth knowing and multiplying. Agro-ecology is their current way of production, as put in place by Fernando Funes. The Cuban government has defined the social mandate of the diary sector as follows: " to produce milk for children, elderly and sick people", thus, increasing milk production became a political priority (Funes et al., 2008). A food concern is therefore in the political agenda of the Cuban administration. However, it is evident that in order to gain food sovereignty, Cubans will have to innovate in terms of energy-efficiency of their production and invest into alliances of small-scale organizations, able to make change.

E. World Food Crisis and the Need of Sustainability

The field of agriculture has been facing a serious global crisis. In late 2007 and 2008, there has been a dramatic spike in food prices. Different countries of the world experienced food riots and protests, as well as governments taking drastic measures like banning the export of food from their economies to other countries. This phenomenon caused a major crisis around the world, people experienced hunger and governments of many countries had to prove their ability to stay in power despite massive protest. However, this crisis is not a just been a food prices crisis, but a nutrition, poverty-related and ecologic one.

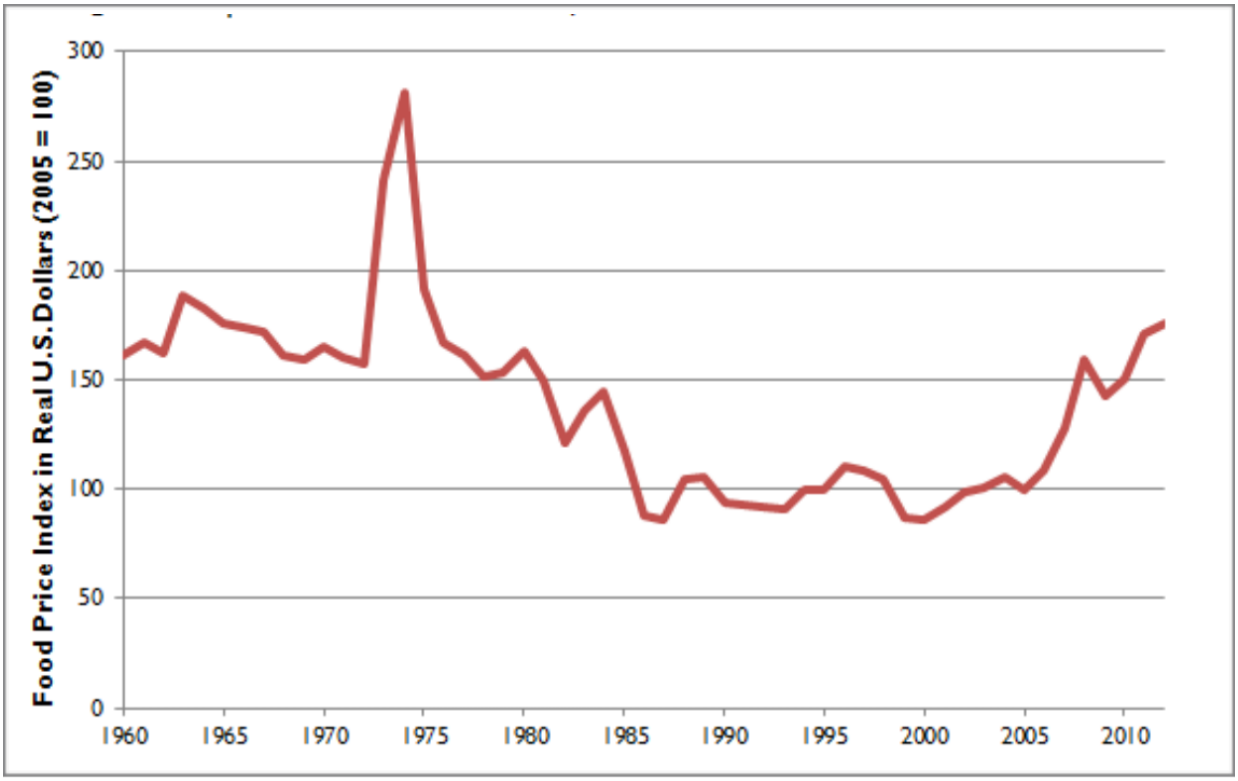

Figure 9: Global increase in food prices since the 1960. Source: World Bank, 2016.

"The current food crisis reflects the environmental vulnerability, social inequity, and economic volatility of the corporate food regime. Absent profound changes we will continue to experience… ever graver crises." (Eric Holt-Giménez, 2010)

The idea of the food crisis has been presented as something new, which has generated a huge concern for peasants who have been perceiving the state of crisis in the agricultural field for at least the last 40 years. Indeed, data from the World bank demonstrate that the food prices have experienced a dramatic increase already in the 1960s (figure 9).

Thomas Malthus was an English economist who wrote an influential treaty in 1798, *An Essay on the Principle of the Population*. His argument in the essay was that food prices would continue to go up, every time that not enough food is produced. Food production could never stay ahead of population growth because it would be constrained by farm land assets that can expand only slowly, while human population tends to grow exponentially (Paarlberg, 2013). However, he proved to be wrong.

The roots of the world food crisis can be found in the times of birth of the economic globalization, commonly relying on free-trade agreements, such as NAFTA, WTO or other regional and bilateral free trade agreements. World political economy has been marked by a deep controversy over these agreements where issues of agricultural trade and farm subsidies have played a central role (Rosset, 2004). Farmers in the whole world have been faced with their local markets being inundated with low-quality, subsidized and cheap food coming from large food surplus agro-exports, from countries like US and the EU. This form of dumping- where the food surplus production is dumped into the economies of other countries- was put in place because of US government food subsidies and supplied other countries markets with food at a cost that is below the cost of food production in the local food markets. This has resulted in a situation where a farmer in Mexico, in Ghana or in Cuba had to face a local market being filled up with products from the US or EU at a lower price than the price of his production which contributed to drive many local producers out of business because unable to compete with such an inexpensive products, by driving farmers off the land and accelerating the migration from rural areas to the cities.

However, World Bank data has shown that since 1960 there has been a significant increase in the food production per capita, rising steadily since then. This demonstrates that

ever since the world food crisis broke out, there has never been more food available per person than ever before in the history. Therefore, some other explanation has to be found. The Malthusian argument that food would grow arithmetically and human population geographically and that there would be a massive gap between food production and population that would cause mass famine has not been born out by history. We can suppose that before the crisis of high food prices, the rural world was already in crisis, with farmers leaving the land a lot before , when low prices where being applied.

There is a series of policy- and human-driven forces that have been unleashed in the global economy since the beginning the neoliberal globalization which undercut the ability of farmers everywhere to make a living out of their production. Apart the already mentioned free trade agreements, allowing cheap food to be produced and dumped by the economies of large exporting countries through export subsidies, other forces driving farmers out of business are the monopolies and oligopolies of transnational corporations over the markets where they sell there products and the markets where they buy their inputs. There are increasing fewer pesticides and fertilizers companies selling these input products to the farmers, an this lower competition makes the prices go up and increases therefore the whole production cost. Nevertheless, there are increasingly fewer companies that buy the harvest of the farmers. There are just a handful of giant trading corporations that control 70-80 % of the global markets of all of the major food commodities, like corn, wheat, soy beans. As there are increasingly fewer companies, they have a significant negotiating power which farmers obviously do not have.

"The rules that govern food and agriculture at all levels – local, national and international – are designed a priori to facilitate not local, but international trade."
(Mulvany Patrick, 2005)

The process of economic globalization of neoliberal kind has proven since its beginning not only to link the markets around the world, but also to invent the rules that govern food production and consumption. Diversity of world's food system is reduced, for the benefit of huge multinational food companies, while small-scale farmers are being marginalized. This context gave a sufficient reason to a movement like La Via Campesina to be created and to gain with some time global recognition in matters related to the discourse on food (Martinez-Torres, 2010).

However, if one had to think positively, one of the effects of the world food crisis was, that it has contributed to an increased investment into agriculture, and this fact represents a crucial step for the realization of the right to food.

F. Policy Implications for a Sustainable Agriculture

The aim of any State is to provide its population with such a food system, that enables it to feed with an adequate, or even abundant, supply of nutritious foods. It is a human right. The concept of food security calls to mind this basic human right and conjugates it with a policy framework to enable its realization. However, it is recognized that the knowledge to reduce and in general fight the hunger issue, are not missing. What is lacking and needed is political will. This is a part of policy agenda for FAO and many other international organizations, seeking the accomplishment of human rights, mainly in the sector of development. However, the resources and knowledge we have now need to be mobilized to the benefit of the hungry and be translated to policies of every single State and thus ensure the full realization of concepts like right to food and food security.

However, it is recognized that the knowledge to reduce and in general fight the hunger issue, are not missing. What is lacking and needed is political will. This is a part of policy agenda for FAO. The resources and knowledge that are available now need to be mobilized to the benefit of the hungry and make part of the policy agendas of each single State. Indeed, Olivier de Schuttuer, Special Rapporteur of the Un on the food issues specified in his report "Agro-Ecology and the Right to Food" that "Agriculture should be fundamentally redirected towards modes of production that are more environmentally sustainable and socially just" (De Schutter, 2010).

Nonetheless, reaching the objective of sustainability is often a question of effective public policy of a State. There are several ways to measure the achievements of a State on its way to sustainable development, as expressed in the Report of the US National Research Council :

"Sustainability is best evaluated not as a particular end state, but rather as a process that moves farming systems along a trajectory toward greater sustainability on each of the following four goals:

- *Satisfy human food, feed, and fiber needs, and contribute to biofuel needs*

- *Enhance environmental quality and the resource base*
- *Sustain the economic viability of agriculture*
- *Enhance the quality of life for farmers, farm workers, and society as a whole*

(D Jackson-Smith, 2010).

Therefore, sustainability can be understood as the capacity to provide for core societal needs in a way that can be easily further continued into the indefinite future without significative negative effects (NRC Report, 2010). It is seen as a conjugation of environmental, social and economic aspect of a country and of a life of human being.

The transition to an energy efficient agriculture will represent a challenging task that requires long-term approach. It is being analyzed, at the international level, to develop systems that integrate agricultural production and bioenergy, as renewable energy produced in these systems increases the productivity of land, reducing the need for damaging natural landscapes and helps mitigate climate change.

Therefore it is clear that a policy framework stressing the discourse of food sovereignty, emphasizing the importance of local food systems, improving and reinforcing their diversity is needed everywhere, in order to enable world's food systems multiple benefits to be shared globally, and not only where the issue of famine is dictating the rules of agricultural policy making.

Building an effective global food policy agenda requires a sense of empathy towards the needs of the majority. Such an agenda "embraces not only the control of production and markets, but also the Right to Food, people's access to and control over land, water and genetic resources, and the use of environmentally sustainable approaches to production.". Agricultural education is key because the majority of human beings is educated for the life in great cities and massive consumption-oriented lifestyles. An agricultural, rural education helps reconnect people with nature , with the natural environment with ecology and with the food.

As Via Campesina declared:

"Peasant and farmers' seeds are under threat of extinction. If we do not change the course history is taking, our children will not be able to produce their own food. If the know-how of farmers and peasants in selecting and conserving seeds disappears as older people pass away, our children will be left at the mercy of multinationals. If small-scale practitioners do not, starting today, go and retrieve from still accessible refrigerated banks the seeds of their parents which are required for new selections, then these seeds will no longer be available tomorrow." (La Via Campesina, 2013).

Hence, what could be done in the immediate future?

Experts on sustainable policy- making suggest that every State has to include trainings of professionals in agricultural sciences and economists so that they can successfully advise governments, financial institutions and producers. Such a training should provide the tools and sufficient knowledge and project the spatial planning of sustainable agricultural production and identify policies and long-term investment projects (Folke, 2002).
Moreover, adequate analysis methodologies are needed for the identification of the most appropriate way of production in the agricultural macro-areas that have agro-ecological viability, with technology options that allow them to increase their competitiveness of the sector, not necessarily those that maximize yields, but the that can produce more at lower costs.

G. Is Cuba a Sustainable Society ?

For the developing countries, the challenge of achieving sustainability requires a series of great political, economic and social transformations. For Cuba, these transformations are, in principle, a fact that has started to materialize since many years. By putting in place organic farming methods, Cuba has accomplished substantial steps towards sustainable development.

Cuba is a country where sustainable development has become a daily reality. It has proven that there are issues that do not depend on financial resources or economic blockade. Cuba is exceptionally endowed with natural and human resources, which can have an enormous potential. Indeed, the essence of sustainable development is in its local development. And it can be assumed that if an endogenous development at the local level is

achieved, it will transcend on a national scale. However, In Cuba the state and government functions are exercised centrally, the whole policy of the country is drawn, directed and controlled centrally by the Communist Party Cuba. This represents the main obstacle for pursuing sustainable policies since it slows the local initiatives because of the lack of the freedom of management. The current situation provides an integral concept of sustainable development, understood as a process where policies of economic and social, scientific, technological and fiscal development, raising the quality of life of the population, trade, energy, agriculture, industry, preparation the country's defense and others, are intertwined with the requirements of environmental protection and sustainable use of natural resources, within a framework of social justice and equity.

Organic farming has been taking place mainly in the urban gardens, called *organopónicos*. The organic revolution was not only a change in terms of policies, but also and most importantly, a change of approach- from rural to urban. The Cuban case does not only represent a change of the model of production, but a beginning of the use of another space that puts a question mark above the rural space being previously used for agricultural purposes, and introducing the urban space into the agricultural reality. It did not represent an isolated movement, but a massive one with a wide popular participation.

Organopónicos contributed to enhance the rural migration to the urban areas. They provide fresh and cheap products, bring employment and improve the overall appearance of the decayed urban areas. They also enable farmers to make profit out of previously unused pieces of land and ease the access to food on a local scale, and therefore feed a significant amount of local population. 8% of the land in Havana supplies its citizens with over 90 % of their fruit and vegetables. Cuban organic urban gardening is gaining attention far from its shores. Apart from being an innovative change of model, the Cuban Green Revolution represents the beginning of putting into practice of a new agricultural space that calls into question the rural space being previously used for agricultural purposes. In other words, organic agriculture introduces the urban space into the agricultural reality and puts emphasis on its sustainability.

Cuba has shown in this way that in order to be sustainable, one has to learnt from the past and does not need any sophisticated and expensive technologies. It has simply relied on the local knowledge, on the experiences of the farmers that have been keeping the old traditions and have shared them between themselves. As Marcello Di Paola interestingly

pointed out during a TEDx talk at LUISS University in Rome, urban gardens have an enormous relation to sustainability: they increase food security, improve food sovereignty, decrease global deforestation, biodiversity loss and reduce the inefficiencies and waste (Di Paola, 2015). Indeed, the current agricultural production in Cuba is based on organic practices, which do not pollute the environment and make the best rational use of resources of each region and territory.

Energy has represented the key factor for Cuban agricultural development. In the evolution from traditional to modern agriculture, energy use has increased considerably, which has also involved significant environmental impacts. Such an increase in the use of energy not only reduced the agricultural efficiency, but also energy efficiency. Therefore, it became vital to the attaint an efficient use of energy resources in order to increase production, productivity, competitiveness and sustainability of agriculture.

Nonetheless, modern agriculture is energy intensive. Energy is needed at all stages of food production, both directly and indirectly. The increase in oil prices has increased the costs of agricultural production and stimulated the production of biofuels (Lake, 2012).

Cuba, historically an important agricultural and livestock producer, although depressed by the economic crisis of the last century, has taken steps to reverse this situation, with measures that, unquestionably, have lead to increased use of energy for the revival of this important economic sector. However, a series of measures accompanying these steps were put in place, aiming at an accelerated introduction of renewable energy sources which fostered the creation of closed cycles for the conservation and preservation of the environment. And here Cuba already gained a point for its progress towards sustainability.

Before the advent of the Revolution, Cuban economic development was achieved on the basis of extensive farming with inadequate use and management of soil and intense destruction of forested areas. Further, the effects of chemical warfare implied by the US blockade on the island contributed to the degradation of the environmental issue in Cuba. The triumph of Cuban Revolution also involved important environmental improvement, in other words, the eradication of poverty and its consequences in terms of health and education, improvement of environmental conditions and quality of life within a framework of equity, increasing the national forest area, the progressive declaration of protected areas and national parks, the systematic work of land management and environmental assessment of prioritized

investments, the use of scientific capabilities in the diagnosis and development of technologies for solving many environmental problems, the process of progressive introduction of the environmental dimension in the national education system rigged to the growth of national environmental management among others. Therefore, it is necessary to acknowledge that the Cuban government adopted a supportive stance towards the tendency to sustainability.

Organic farming is often put forward as an economically viable way of sustainable food production. Organic farmers manage nutrients without application of chemical fertilizer, using a combination of crop rotation of species with different nutrient needs, application of animal manure and compost, soil-building cover crops in the sequence and calculating a careful nutrient budget to assess crop removal as well as potential for building soil fertility over time (Baldwin, 2011).

In the last years, since 2011, a process of institutional change started to take place in Cuba. These changes deeply affect the economic model previously existing. Structural and managerial transformations are happening and this Cuba is getting international recognition. The representatives of the UN suggested that reaching sustainable development is only possible within a context of planned economy. UNDP recognized Cuba as a continental reference in sustainable development and as an example of sustainable development for the whole region (Claudio Tommasi, UNDP). It has been acknowledged that the Cuban success in terms of sustainability is due precisely to its planned economy, where both the social and economic objectives are planned. Therefore, even environmental objectives can be planned, something that would be impossible in the capitalist countries, because whatever economic model based on the market will never take into account environmental aspects.

UN recognized the immense efforts put in place by Cuba within the context of sustainable development in Cuba over the following 6 facts :

1. Over the past 50 years, comprehensive social protection programs in the country have focused mainly on ensuring food security and nutrition as a key priority.
2. Cuba is one of the most successful in reaching the Millennium Development Goals countries.

3. The comprehensive approach to Cuba in maternal and child health has reduced morbidity, mortality and malnutrition; low rates moderate and severe weight in children under 5 and stunting are below 5 percent.
4. Cuba has reached the Millennium Development Goal number 3 - "Promote gender equality and empower women".
5. Since 1994, Cuba has been gradually reducing the proportion of agricultural land under the control and management of the state. Between 2009 and 2016, about 280,000 people received about 1.4 million hectares of agricultural land in usufruct.
6. Recurring climatic hazards - ranging from tropical storms, hurricanes, heavy rains, droughts and occasional earthquakes - pose still a threat to national food security and nutrition.

Cuba is an international referent because within its public policies- economic, social and cultural - it can specify up to what extent its model impacts the environment and whether it can. In Cuba, the collective consciousness about the environment is attained through one of the objectives of the Revolution- education. The question that arise to most scholars and policy-makers interested in the Cuban case is, nonetheless, to what extent will the impressive Cuban achievements in terms of sustainability and food successes be touched upon by the opening of diplomatic and later, commercial relation with the United States.

Conclusions

The aim of this research was to demonstrate that the island of Cuba, despite being a developing country, historically isolated on the international political scene, managed to become a world leader in sustainable organic food production. Through the analysis of the evolution of agricultural policy-making in Cuba and of the reasons that induced Cuba to choose an organic agricultural policy, I answered the research questions as of to which extent organic agriculture in Cuba can be considered as a choice of sustainable development and what are the main reasons behind this choice. In order to reach this research objective, I executed an analysis based on the theoretical framework of the theories of development and theories of agricultural policy-making. This rich theoretical structure helped me to understand why does a country choose to implement policies of organic agriculture and to give an answer to the question of whether Cuba is on its way to sustainable development.

The central idea I intended to put forward in this work is that in a country like Cuba, in spite of the numerous economic and political difficulties and after 20 years of efforts, *ecological urban agriculture* represented the response to the national food crisis, that broke out following the dissolution of the USSR. This movement uses ancient wisdom in a context of global crisis positioning Cuba as leaders in the production of sustainable and organic food and based itself on values of food self-sufficiency, intergenerational and multidisciplinary education and wide popular participation. The organic farming put in place in Cuba represents a way for the realization of the concepts of food security and food sovereignty in a wider context of sustainable development. In order to illustrate my main points and to give an exhaustive answer to the research questions, this work was divided into four parts:

The first part provided a detailed overview of the Post-Revolutionary Cuban history and focused on the main two external historic events that impacted Cuba since 1959, namely its problematic relationship with the USA and the resulting imposition of the economic embargo and, secondly, the favorable relationship with the Soviet Union. These two remarkable historical circumstances have given the impetus to the Cuban administration, and more specifically to the Cuban farmers, to begin a nation-wide transformation to organic agriculture, excluding the use of any chemical product, given its evident shortfall. The chapter begins by examining the sense and the main ideas of the Cuban Revolution, that saw its official beginning in 1959, after many years of preparation. The victory of socialism on the island lead the United States to impose an international economic blockade against Cuba.

Further, the Cuban economy opted for a commercial exchange based on favorable terms of trade with the USSR, including mainly Cuban sugar cane in exchange for the Soviet petroleum. In 1989, with the fall of the USSR, Cuba was left with no supplies, which had created an imbalance in the economy and this fact had as a consequence a national food availability and safety problem, leaving the country in a chaos. Despite some significant achievements of the Revolution, mainly in the field of education and health care, Cuba had to solve a problem to which it was not sufficiently prepared. Having opted for a highly-technical model of agriculture, and having chosen the policy of single crop, its agriculture was not autonomous and could not ensure the nutritional needs of the population. With the announcement of the beginning of the Special Period, the country was plunged into a national food crisis and would have to start looking for an alternative for its agriculture and economy. The main conclusions relative to the first part of this work hinge on the idea, that the imposition of the embargo was not unilateral, but represented a reaction to a series of measures of nationalization of US properties on the Cuban soil enacted by the Cuban state. Secondly, the centralistic management of all the resources- natural and economic- practiced since the beginning of the Revolution in Cuba, has further worsened the seriousness of the food crisis that the Cubans had to face during the Special Period.

The second part focused on the general background of the food issue in Cuba. It first provided an analysis of how the states opt for a specific agricultural policy. In this framework, it has been demonstrated that the choice of an agricultural policy is driven, in most cases, by the imperatives of economic kind. Further, the analysis of the structure and composition of the Cuban economy had served to explain that the main crop dedicated for the purposes of trade has always been the sugar cane. Therefore, an implementation on a national scale of the policy of single crop had led to the adoption of poor eating habits of the Cubans. Indeed, right after the discovery of America, Cuba underwent a process of colonization that caused the almost total elimination of the aboriginal population, which led to the creation of very different eating habits to those of its native population. The preference for fried products, the abundant use of sugar, low consumption of fruits and vegetables and using little variety of seasoning plants (garlic, pepper, onion and tomato, preferably), make a style of inadequate food, which would further be enriched thanks to the organic revolution with the wide range of resources, mainly fruits and vegetables offered by the Cuban soil. Later in the chapter, an examination of the main approaches of the agricultural policy-making follows, demonstrating that the political aspects of every given agricultural approach have always to be taken into consideration as an interpretation relative to the reason of a choice. The chapter follows by

analyzing the positive outcomes of the latest and most modern approach of agricultural policy framework, in other words, organic agriculture. After having pointed out the main challenges and characteristics relative to the organic approach, the history of agricultural policy-making in Cuba is examined. By providing an overview of the history of the Ministry of Agriculture of Cuba, the readers can understand the specificity of the decision-making process in the Communist Cuba. Further, the chapter gives an exhaustive overview of the changes put in place by the Revolution, and thus the two agrarian reforms, which represented the fundamental conditions for the implementation of the organic farming in Cuba.

The third part of this work was related to the Organic Revolution itself. It provided a detailed examination of the principles on which the cooperative form of farming has been functioning, among which the ecological principles and the respect for the knowledge of local community are especially worth mentioning. The emergence of the alternative farming techniques in the country was motivated by the inefficiency of the national agricultural system to meet the food needs of the population, by the depletion of agrarian model in the late eighties and by the negative impact that this system has had on the external environment. Since 1959, with the enactment of the First and Second Agrarian Reform Law, large amounts of land were given to farmers. Although charted as a strategy to improve the diversification of agriculture, with the aim of reducing dependence on sugar and substitute the food imports- which still result high- and diversify exports, the concepts of the Green Revolution were adopted , basing itself on the frequent use of foreign resources and leading to the creation of the policy of monoculture. Therefore, organic farming was slowly implemented and was remarkable because of an intensive use of renewable natural resources, like solar energy, nitrogen, and carbon from the air, as well as rain water. On the contrary, Cuban organic farming is worldwide recognized for the least possible use of exhaustible resources, such as fossil energies and techniques that can contribute to gas emissions of the greenhouse effect. Besides, it has been proven that the agro-ecological technologies, that were put in place in the urban organic gardens known as *organopónicos*, were capable of ensuring improved interaction between man and natural resources and therefore overcome the environmental limitations presented by conventional agriculture. The proposed alternative of organic farming in Cuba replaced mineral fertilizers by organic fertilizers. However, it encountered several obstacles for a wider dissemination, because of the difficulty to produce the necessary quantities, which were requested by the local population. The quantities produced in the beginning were small relative to the area they supplied and the high cost of transportation, outside the local community.

The objective of the fourth part was to analyze the issue of sustainability, by presenting first some general notions of sustainability and later introducing its connection and perspectives with the sector of agriculture. This chapter has demonstrated that Cuba has all the requirements necessary to be considered a sustainable society. Organic agriculture has recently been on the rise in the industrialized world. This increase of awareness of the environmental issues has happened in response to the demands of economies of scale and standardization created by the powerful seed and agro-industrial companies, crop and livestock systems implemented within the framework of the conventional agriculture. The idea of developing production systems based on organic farming does not mean a return to agriculture of the past century. Moreover, it has been demonstrated that in order to develop organic farming practices, a deep knowledge of ecology, biology and agronomy is needed. Similarly, this kind of agriculture cares about establishing the most favorable conditions for the development of many different beneficial insect crops (insect pollinators, beetles predators for aphids, etc.) to promote the development of cultivated plants without the use of synthetic chemicals. Contrary to the common thinking, organic agriculture does not represent a sort of regression to the old techniques, but a very modern approach that makes use of extensive knowledge of the functioning of natural cycles.

This work might be of importance for the academy due to an existing a gap in the scientific literature on the Cuban case from the perspective of sustainable development. Instead, for policy-makers interested in sustainability, Cuba represents a fascinating example worthy researching about and of which to take inspiration. If I had to provide some recommendations for further research, looking to the future, I would suggest analyzing what impact the newly developing diplomatic relationship between Cuba and the US might have on the organic agriculture in Cuba. Moreover, it is worthy understanding how the organic kind of agriculture contributes to reaching the objectives of Sustainable Development as defined by the Agenda 2030 of the United Nations, and more specifically, how the implementation of an organic way of faming contributes to a better economic performance in the country. The major difficulties I encountered during the research included mainly data collection given that most of the database are not reliable due to the complicated access to the official data from the Cuban government.

In this master thesis I demonstrated that the Cuban revolution in organic food production derived from a series of both external constraints and internal necessities. Both

elements were caused by two main historic events, culminating during the period of the Cold War and both functional to each other. Namely, the imposition of US embargo on the island forced the Cuban elite to opt for an alternative trade partner, USSR. Therefore, with the dissolution of the latter, the economic and agricultural structure that had been put in place was in danger. To this is therefore strictly related the internal necessity pushing Cuba for an ecologic alternative for its agriculture, being characterized by a high level of dependence on external production inputs.

My intention was to show, with the help of the framework of the theories of development, that a solution to a problem often relies in the way in which a problem is presented. The main conclusions that can be drawn from this research and the concrete outcomes of this research hinge upon the two following facts:

Firstly, one of the pillars of the success of the organic revolution in Cuba has to be attributed to the existence of the cooperative movement of Cuban farmers, who through the practice of local knowledge-sharing found a way out of the crisis for Cuba. Organic agriculture has proven to be the development alternative for Cuba. Possibly this will also become a reality, in some years, for the rest of the Latin America because of the growing interest in the natural environment in which people are living. The ongoing talks about sustainable development and sustainable agriculture represent a step towards this direction, for which the cooperative movement is a bridge and a facilitator at the same time.

Secondly, the real solution to the national food problem was represented by the creation of *organopónicos*, urban ecologic gardens created at the suburbs of Cuban biggest cities, which apart from providing food to the surrounding local communities, managed to change the poor eating habits of the Cubans and contributed to the elimination of hunger.

Thirdly, Cuba is effectively on its way to become a fully sustainable society. Achieving sustainability is not an easy matter, given that it involves many different dimensions and presents a series of challenges. Cuba possesses all the requirements in order to leave a contribution in terms of natural preservation for the future generations and the implementation of an organic kind of agriculture helps it in achieving the goal of sustainability. Achieving sustainability requires hard work and Cubans, the revolutionary people, have demonstrated an important degree of interest in the social matters. Apart having created a promising education and health care system, developed good technologies, educated many scientists and world sportsmen, and provided a great deal of cultural enrichment to the entire world, their contribution in terms of agriculture provides a model and example for us to follow. If

sustainability became reality in Cuba, it can be so in Europe and United State as well, by being able to face the environmental constrainst of the 21st century.

In the final analysis, organic agriculture can and has to be achieved starting with local organic farming in order to later become a strong agricultural cooperative movement. In such a way it can be an example of achieving sustainability in any given country. That is why Cuba is already taking a direction in this regard.

Nonetheless, I would like to share a series of personal impressions and concerns. Despite the already demonstrated strong and supportive stance of the Cuban State towards sustainability, one of the factors that hinder the effective realization of the sustainable development in Cuba, in my opinion, is the lack of individual decision-making power. During my stay in Cuba and during the phase of analysis of this very specific case of Cuban organic agriculture, my impression was that the population is generally marginalized from the participation to the decision-making. This trend has acquired nuances of popular dissatisfaction that is the same as the concept of the loss of welfare, basic element of sustainable development, especially in a country where prevails the idea that "the first law of Cubans is necessarily the full dignity of man". Cuban people are a source of infinite happiness and enthusiasm and despite their immense economic difficulties, they survive a deal of optimism, that they can even donate. By implementing the idea of urban gardens, Cubans have made proof of a spirit of individual initiative and have succeeded. However, such policy framework will be needed, that will allow the cooperative movement and the organic farming to survive, even in case of the eventual opening of the agricultural market of the United States to Cuba. Further, I would like to point out that the sustainability of food systems is not merely a technical matter. It constitutes a challenge demanding the highest political will of states. Single countries should create such nation-wide policies in which they would commit themselves to organic sustainable agricultural production approach. As far as the US position towards Cuba is concerned, the economic interest in Cuba is growing as well as the possibility of future Cuban imports of agricultural products form the US. The main obstacle continues to be represented by the embargo, whose removal depends on the Congress, dominated by the Republicans and contrary to any change in the US-Cuba relations, unless the respect of human rights and democracy is in place in Cuba. My main concern remains the perspective of Cuba importing one day the inputs for agricultural production from the United States which might affect the existence of the idea of a cooperative and the whole urban gardening practice. In the contrary, I do not deny that if the US start importing Cuban organic food there will be an overall improvement of the health of the American population.

Summary

Introduction

Since the advent of the Cuban Revolution set by Fidel Castro in 1959, Cuba developed a highly industrial model of conventional agriculture, relying the production on external chemical and petroleum inputs imported from the Soviet block. When in 1991 the Soviet Union fell apart, national food crisis broke out on the island, as a result of the shortage of food production inputs. This crisis became known in Cuba and worldwide as "Special Period" and lasted the whole decade of the 1990s. Special Period, apart from being caused by the shortage of oil imported from the former Soviet block, was aggravated by the harsh economic embargo imposed on Cuba by the United States since 1961. The solution that Cuba found to the national food issue is in this work presented as Organic Revolution. Cuba became the world leader in organic food production and managed to substitute chemical fertilizers by mineral and agro-ecologic products.

The aim of this master thesis is to demonstrate that the choice of an ecologic alternative in Cuba resulted from both an external constraint and internal necessity. This work tries to answer the following research questions: To what extent can the choice of an organic agricultural policy in Cuba be considered as a choice for sustainable development? Is Cuba a sustainable society? This thesis analyzes what are the reasons behind the choice of the organic agricultural policy in Cuba and the reasons that lead the states to choose a particular agricultural policy. In order to provide an answer to these research questions, the work is divided into four parts.

In the first part, the history of Cuba since the advent of the Revolution is analyzed, in order to discover where the roots of the food issue of the 1990s originate. The second part focuses on the agricultural policy-making of the states, by seeking the reasons that motivate particular policy choices. In this perspective, the Cuban agriculture is examined, from its structure and composition to the history of agricultural policy-making in Cuba. In the third part, the organic agriculture and its principles are analyzed. Finally, the fourth and last section provide an overview of the notions of sustainable development and an answer on the extent to which Cuba can be today considered a sustainable society and an example for the developed world.

As such, this thesis hinges upon the theories of development and a general theoretical framework of agricultural policy-making. More specifically, the main focus is put on the theories of modernization, radical theories of development and finally, theories of liberalization. The justification of this conceptual choice lies in the fact that the Cuban reality is one of a developing country, even though with its own peculiarities. Thanks to a detailed historic and technical analysis of the issue of organic urban farming, it demonstrates the benefits of this practice in terms of saving the previously starving Cuban population from hunger.

Organic agriculture in Cuba

Cuba managed to create "a world-class case of ecological agriculture" (Funes, 2012). In a wider global context where hunger, malnutrition and rural poverty represent the most essential challenges of international policy-making, the Cuban achievement is, indeed, worth of researching upon. In 1991, after the collapse of the former Soviet bloc, Cuban economy suffered an immense loss, mostly evident in the lack of oil. Until then Cuba was importing each year around 12 millions of tons of oil from the USSR (Funes, 2002). The lack of this important energetic input was mostly noticeable in the field of agricultural production which has been deeply dependent on the chemical products issued from oil, such as pesticides, fertilizers, and chemical irrigators. This dependency, which instituted also a significant level of vulnerability for Cuba, was created after the revolution of 1959 when an industrialized and chemistry-intensive model for agriculture was put in place by the Cuban Ministry of Agriculture. Following the downfall of the Soviet Union, Cuba had to choose between leaving its population to suffer from hunger or switching to an alternative that would be both economically and ecologically feasible. A more common-sense and logical approach to food and farming was put in place (Wright, 2012).

Cuban organic revolution happened due to a combination of significant external constraints and an internal necessity. The latter was represented by the imposition of the US embargo on the Cuban economy, cutting Cuba off the supply of American goods, and more importantly, American currency. The external constraint, that influenced the Cuban transition from an industrial-based agriculture to an organic and sustainable one, was represented in the second place by the collapse of USSR. In this optic, Cuban case deserves to gain a global recognition for its agricultural success. Since 1991, when the main historic event of the end of Cold War dictated a change of course for its economy, Cuban island has been demonstrating an impressive effort done in cooperation with its people to fight the food issue in the country.

In the majority of the industrialized countries, the prevailing view of the Cuban economy is that every industry and every form of service - restaurants, taxis, and accommodation, are controlled by the State. For years, this reality has been largely accurate. Nonetheless, the stagnant economic growth through which the country has been going since the collapse of the USSR and the imposition of US embargo, instituted important reforms in the country, giving a significant decision-power to individual "entrepreneurs".

It is now considered that Cuba has integrated free-market elements into a socialist model, by putting in place an organic revolution (Wright, 2012). For some scholars Cuba is going through a process of institutional change, others deny it (Romero, 2014). Nevertheless, Cuba of today has gone through the largest conversion of land farming methods that took place in history: from conventional agriculture, dependent on chemical inputs to a model based on organic products. The example of Cuba has provided great inspiration and vision for countries all around the world eager to develop a more localized, sustainable food system (Wright, 2005). This conversion from conventional to the alternative way of agricultural production had its numerous social implications. As far as the economic transformations are concerned, Cuba learned to be less dependent on fossil fuels. From the point of view of the social context, its population did not have to starve due to an innovative and environmentally friendly food system.

Choosing an agricultural policy is dependent on the geographical situation of the country, on the challenges and demands of its market, on the state and availability of the technologies and most importantly, on the availability and access to natural resources of a country. In the developing world, the most challenging issues are represented by hunger and rural poverty and therefore require a prompt answer by national and international policymakers and cannot be just tackled at the technical level. In this perspective, the importance of concepts like food security and food sovereignty is crucial for the food issue all over the world. Cuban agricultural policy is put in place by the Ministry of Agriculture, an institution itself worthy of focusing on, because of its rich history. Since the outcome of the Revolution, health, education and housing were issues on which the Cuban government was putting the highest priority (Wright, 2005). Therefore, being able to feed its population represented since the beginning not just a merely socialist concern, but a priority that had to be accomplished.

Before 1959, Cuban agricultural system was characterized by huge American-owned enterprises, so-called "*latifundos*" controlling the majority of food production. With the triumph of the Revolution in 1959, the issue of the ownership was partially resolved (Funes, 2009). Most of the previously American-led companies turned to the ownership of the state. After four hundred years of Spanish and a half century of the American colonization, the country had an agrarian structure with deep deformations: a high presence of foreign capital, with the US companies owning more than one million hectares. There were large cane and livestock estates, the mono-exporting economy was mono-productive and had low use of the surface and poor living conditions of the peasantry and agricultural workers. All this, coupled with a poor preparation of human capital and few knowledge in the agricultural sector, further worsened the situation. With the First Agrarian Reform Act, approved right after the Revolution, the transformations of Cuban agriculture began to evolve. As a result of this first law, the state became the owner of 40% of the land across the country.

The economic and military measures put in place by the American administration began immediately after the first revolutionary reforms were taken in Cuba, which have been deeply affecting the interests of the landowners- *latifundistas*. These measures forced the revolutionary state to enact in 1963 a second *Ley de Reforma Agraria* [18], which limited individual ownership to 67 hectares per person (Alvarez, 1994). In this way, Cubans became owners of 70% of the land and the figure of the state enterprise, as a distinctive feature of Cuban agriculture and a determinant of its ownership structure, was consolidated at that time.

When trade relations with the socialist bloc collapsed in 1991, food imports declined by more than a half, the pesticides did more than 77%, and the availability of oil for agriculture by 50%. The agricultural system experienced a double challenge: the need to double food production while their inputs decreased by more than half, while maintaining export crops not to further deteriorate the desperate situation of the balance of international payments in the country.

However, Cuba has demonstrated to be a master of transforming necessity into opportunity, as was the case of the Organic Revolution with its numerous economic social and environmental benefits. Cuba of today is recognized for the largest conversion of the land farming methods that took place in history, from conventional agriculture, intensive in

[18] Agrarian Reform Law (free translation)

chemicals, to a model based on organic materials. Cuba is an international referent because within its public policies- economic, social and cultural - it can specify up to what extent its model impacts the environment and whether it can. In Cuba, the collective consciousness about the environment is attained through one of the objectives of the Revolution- education.

By putting in place organic farming methods, Cuba has accomplished substantial steps towards sustainable development. Organic farming used to be a fashion trend in the past. Today it is developing from a theoretical concept to a fully established practice. Farmers reduce their dependence on externally produced agrochemical inputs and the whole system of agricultural production is redesigned (Funes in Gliessman, Stephen R., and Rosemeyer M., 2009). By understanding which areas were the most suitable and prosperous ones, small farmers started to develop them by occupying a piece of land that originally belonged to the State, but since the imposition in 1992 of the law of usufruct, these spaces could be exploited by an individual. These land spaces were called *organopónicos* and one of their characteristics is the that they are surrounded by buildings and therefore, represent a perfect example of *urban gardening*. Indeed, most of the agriculture in Cuba is uniquely urban.

In Cuba, the organic revolution was not only a change in terms of policies, but also and most importantly, a change of approach- *from rural to urban*. The Cuban case does not only represent a change of the model of production, but a beginning of the use of another space that puts a question mark above the *rural* space being previously used for agricultural purposes, and introducing the urban space into the agricultural reality. It did not represent an isolated movement, but a massive one with a wide popular participation. Organic agriculture in Cuba introduces the urban space into the agricultural reality and puts emphasis on its sustainability.

There is definitely a need to recognise the efforts that Cuba as a developing country is doing. In view of the still lasting economic embargo imposed by the United States, food is being used as a weapon of economic and political pressure, as well as a way of diplomatic promotion for the island. Cuba has been putting in place several long-term state policies to accomplish with the policy of the right to food for its population and investing many efforts into a significant Agrarian Reform that supports small and medium-sized farmers and mobilizes the whole society. Compelling evidence is mounting that alternative farming approaches can outperform industrialized farming in many circumstances (Wright 2012; Pretty, 1998; Parrott and Marsden, 2002; IFAD, 2003; Scialabba and Hattam, 2002).

All things considered, there are some significant lessons that Cuba can teach to other countries. Scholars recognise that the experiences of Cuba with the rapid demise of the Socialist Block and thereby its source of food and fuel supplies ought to provide a valuable example for other nations vulnerable to similar predicaments (Wright, 2012).

Conclusion

The aim of this research was to demonstrate that the island of Cuba, despite being a developing country, historically isolated on the international political scene, managed to become a world leader in sustainable organic food production. Cuba is a country where sustainable development has become a daily reality. It has proven that there are issues that do not depend on financial resources or economic blockade. Cuba is exceptionally endowed with natural and human resources, which can have an enormous potential. Indeed, the essence of sustainable development is in its local development. And it can be assumed that if an endogenous development at the local level is achieved, it will transcend on a national scale. However, In Cuba the state and government functions are exercised centrally, the whole policy of the country is drawn, directed and controlled centrally by the Communist Party Cuba. This represents the main obstacle for pursuing sustainable policies since it slows the local initiatives because of the lack of the freedom of management. The current situation provides an integral concept of sustainable development, understood as a process where policies of economic and social, scientific, technological and fiscal development, raising the quality of life of the population, trade, energy, agriculture, industry, preparation the country's defense and others, are intertwined with the requirements of environmental protection and sustainable use of natural resources, within a framework of social justice and equity.

Energy has represented the key factor for Cuban agricultural development. In the evolution from traditional to modern agriculture, energy use has increased considerably, which has also involved significant environmental impacts. Such an increase in the use of energy not only reduced the agricultural efficiency, but also energy efficiency. Therefore, it became vital to the attaint an efficient use of energy resources in order to increase production, productivity, competitiveness and sustainability of agriculture. Nonetheless, modern agriculture is energy intensive. Energy is needed at all stages of food production, both directly and indirectly. The increase in oil prices has increased the costs of agricultural production and stimulated the production of biofuels (Lake, 2012).

The central idea I intended to put forward in this work is that in a country like Cuba, in spite of the numerous economic and political difficulties and after 20 years of efforts, *ecological urban agriculture* represented the response to the national food crisis, that broke out following the dissolution of the USSR. This movement uses ancient wisdom in a context of global crisis positioning Cuba as leaders in the production of sustainable and organic food and based itself on values of food self-sufficiency, intergenerational and multidisciplinary education and wide popular participation. The organic farming put in place in Cuba represents a way for the realization of the concepts of food security and food sovereignty in a wider context of sustainable development. This work might be of importance for the academy due to an existing a gap in the scientific literature on the Cuban case from the perspective of sustainable development. Instead, for policy-makers interested in sustainability, Cuba represents a fascinating example worthy researching about and of which to take inspiration.The question that arise to most scholars and policy-makers interested in the Cuban case is, nonetheless, to what extent will the impressive Cuban achievements in terms of sustainability and food successes be touched upon by the opening of diplomatic and later, commercial relation with the United States.

Finally, some concluding remarks and concrete outcomes of this research are as follows:

Firstly, one of the pillars of the success of the organic revolution in Cuba has to be attributed to the existence of the cooperative movement of Cuban farmers, who through the practice of local knowledge-sharing found a way out of the crisis for Cuba. Organic agriculture has proven to be the development alternative for Cuba. Possibly this will also become a reality, in some years, for the rest of the Latin America because of the growing interest in the natural environment in which people are living. The ongoing talks about sustainable development and sustainable agriculture represent a step towards this direction, for which the cooperative movement is a bridge and a facilitator at the same time.

Secondly, the real solution to the national food problem was represented by the creation of *organopónicos*, urban ecologic gardens created at the suburbs of Cuban biggest cities, which apart from providing food to the surrounding local communities, managed to change the poor eating habits of the Cubans and contributed to the elimination of hunger.

Thirdly, Cuba is effectively on its way to become a fully sustainable society. Achieving

sustainability is not an easy matter, given that it involves many different dimensions and presents a series of challenges. Cuba possesses all the requirements in order to leave a contribution in terms of natural preservation for the future generations and the implementation of an organic kind of agriculture helps it in achieving the goal of sustainability. Achieving sustainability requires hard work and Cubans, the revolutionary people, have demonstrated an important degree of interest in the social matters. Apart having created a promising education and health care system, developed good technologies, educated many scientists and world sportsmen, and provided a great deal of cultural enrichment to the entire world, their contribution in terms of agriculture provides a model and example for us to follow. If sustainability became reality in Cuba, it can be so in Europe and United State as well, by being able to face the environmental constrainst of the 21st century.

In the final analysis, organic agriculture can and has to be achieved starting with local organic farming in order to later become a strong agricultural cooperative movement. In such a way it can be an example of achieving sustainability in any given country. That is why Cuba is already taking a direction in this regard.

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