

Farmers' Jury



Nicaragua, January 2017

Farmers' Jury

1st Session.

Agenda Issue 1: Report on the present state of Agroecology in Nicaragua.

‘Report on the challenges for the implementation of a transition process from conventional to agroecological farming in Nicaragua.’

SUMMARY

In the ‘Declaration on the Rights of Peasants and Other People Working in Rural Areas’ (HRCAC 2013), approved in 2013, it is stated that ‘Farmers and rural people have the right to participate in the formulation of policies, decision-making and the implementation and follow-up of any project, programme or policy that affects their lands and territories’ (Article 2.4). In light of this, Nicaraguan rural families have promoted the ‘Farmers’ Jury’ as a space for reflection, analysis and decision-making about the actions needed to contribute to a sustainable production model for the country.

In parallel, the Committee on World Food Security (CFS) approved the Global Strategic Framework for Food Security and Nutrition (GSF), which recognises that ‘agroecological practices have proved to be important in improving agricultural sustainability as well as the incomes of food producers and their resilience in the face of climate change’. It also underlines ‘The importance of local knowledge in promoting food security, particularly as the latter is influenced by the capacity to manage natural assets and biodiversity and to adapt to the localized impact of climate change’ (CFS 2010: 2.02m)

Founded on a broad base of studies carried out by academic, governmental and non-governmental entities, this report examines potential challenges and the possible strategies that would contribute to generating a transition process from the predominant Conventional Agricultural System (CAS) to an Agroecological Food System (AEFS).

This report examines the questions presented by the Farmers’ Jury involving: (i) Market policies; (ii) Natural Resource Management (Water and Forests); (iii) Comparative profitability; (iv) Land ownership and public policy; (v) Youth, and (vi) Social awareness about agroecology. It also includes some reflections from witnesses who participated in the deliberative workshop held by the Farmers’ Jury, the *Minutes from the Deliberative Process* are included in the report’s appendices.

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Summary

1. Issue: Market Analysis and Market Policies

(Q1) What types of market exist for conventional and agroecological production? (fairs, markets?).

(Q2) What types of value chains, what types of prices are they and what added value exists?

(Q3) How can distances be shortened between producers and consumers?

(Q4) What is the role of the intermediaries?

(Q5) What impact has free trade had on economic and environmental levels? (including GM products)

(Q6) What role does the government play in controlling prices and trade? What policies are in place?

2. Issue: Natural Resource Management of Water and Forests

(Q7) What is the impact of large-scale investment; mining, large-scale monoculture (sugar cane, peanuts etc.) in water management, family farming and agroecology?

(Q8) Why is environmental legislation not applied?

(Q9) Why is the application of legislation different for large and small-scale agricultural producers?

3. Issue: Comparative economic profitability, impact on the environment and on agroecological and conventional agriculture

(Q10) What differences are there in the economic outputs and profitability over the short and long terms?

(Q11) What environmental impacts occur over the short and long terms?

4. Issue: Land ownership and land policies

- (Q12) What is the current situation of land ownership?
- (Q13) What differences exist in terms of gender and age?
- (Q14) What is the situation of markets, land and land policies?
- (Q15) What role does migration play? And profitability?

5. Young people, continuity in farming and agroecological knowledge

- (Q16) Why do young people have little interest, motivation or incentives to continue in farming?
- (Q17) What mechanisms; access to land, incentives, etc., exist to promote the continuance of young people in farming?

6. Awareness of the population about organic products, health and nutrition

- (Q18) Why is the population passive when faced with the misuse of resources?
- (Q19) Why do people not consume nourishing organic products?
- (Q20) Why do children and young people not learn the value of agroecology and healthy diets in school and university?



Symbols: Question (Q); Assessment (A) and Introduction (INTRO)

I. Introduction

1. This report is a global report that examines the present state and potential of the Food Agriculture System in Nicaragua. It seeks to identify the challenges, gaps, opportunities and strategies that contribute to the transition process from the predominant Conventional Agriculture Food System (CAS) to an Agroecological Food Farming System (AES).
2. This report was written with technical support from the *Campesino a Campesino* [small farmers' peer] programme of Nicaragua's National Union of Agricultural and Livestock Farmers (UNAG) and the Institute of Development Studies (IDS), and is also a reference document for the Farmers' Jury in examining existing challenges for the transition process from Conventional Agriculture Food System to an Agroecological Food Farming System.
3. The report was written using the guidelines given by the Farmers' Jury, with reference to: (i) Market Policies; (ii) Natural resource management (Water and Forests); (iii) Comparative profitability, (iv) Land ownership and Public Policy; (v) Young people and (vi) Social Awareness of Agroecology.
4. By way of context, it is important to point out that there has been a historical tendency over centuries in Nicaragua that has marginalised the majority of rural families, along with the idea that the agricultural sector cannot contribute to the national 'motor of development' (Pérez, 2011). Nicaragua's macroeconomic policy has been centred on fiscal balance (Grigsby Vado and Pérez, 2007), and its incentives and normative frameworks have focused on benefiting 'large-scale capital' by increasing exports and prioritising the negotiation and ratification of commercial agreements such as the Free Trade Agreement between Dominican Republic, Central America and the United States of America (TLC-DR/2005) and the EU-CA Association Agreement, both of which have helped consolidate the agro-export model. The immediate effect of these measures has been the generation of poles of economic power that fight over the control of national capital, in particular equity capital in the form of land, enabling them to generate dividends and install production units for export crops. Similarly, policies have centred on promoting exports, benefiting those economic sectors with export potential, mostly producers with access to fertile land, financing and technology. This means economic groups capable of making heavy investments in technologies that function throughout their value chains (ECLAC 2014). In this scenario, the families of small-scale rural producers have found themselves to be excluded and marginalised from the benefits derived from national policies.
5. In Nicaragua one of the main historical causes for the restrictions in the development of Agroecology is the model for economic growth implemented in compliance with the guidelines set out by the Council of Washington (CW). In 1990 the Council of Washington

became a guide for Nicaragua's economic policy, oriented 'supposedly' to overcome underdevelopment through the implementation of 'structural adjustments' which promoted (i) the reduction of the state to a minimum and the growth of the private sector; (ii) deregulation to turn countries into fiscal paradises; (iii) the export of all national products (generating deficits in national consumer markets) and (iv) the creation of 'Development Poles'/'Prosperous Elites'. From 2007 onwards the paradigm shifted to recuperate the function and pro-active participation of the State in the economy. Although the focus on export crops and the established agrarian structure continues, a set of policies exists to increase gradually the capacity for competition among small and medium-scale producers – men and women – in Nicaragua.

6. Another key element in the context is the prevalence of the neoliberal economic model resulting from the process of change in the configuration of the capitalist economy. One of its premises is the liberalisation of markets (based on the principle that the liberalisation of trade promotes investment and on the assumption that this will be an incentive to economic growth and the distribution of wealth). However, Dr. Avendaño indicates that small-scale production is endangered in any case, since they are 'islands' of economic activity: they do not generate upstream or downstream positive externalities, they do not demand much in terms of national raw materials nor sell their products as raw materials to other businesses. These

“islands are made up of producers of beans, soya, vegetables, oil for food preparation, clothes, shoes, soap and pharmaceutical products. The economic activities that are the country's 'motors' demand many national raw materials and promote economic growth, for example: producers of sorghum, prepared cold meats, dairy products, bakeries and leather products.

(Avendaño 2006)

7. In spite of the important challenges facing producers, agriculture represents the main pillar for sustainable development in Nicaragua. For this reason it is important to define with great care the type of model that predominates in agricultural production. According to figures from Nicaragua's Central Bank (BCN 2012), of the average area of agricultural land in the first decade of the millennium - 51,988.7 km² - 16.3 per cent is arable land of which 56.4 per cent is used to produce cereals.
8. Despite Nicaragua's potential to be self-sufficient in all items of basic dietary needs, in 2010 35 per cent of the available rice was imported, as was more than 20 per cent of available maize and 4 per cent of beans. This tendency is an effect of the predominant export-focused economic model to the detriment of national food sovereignty and security and the sustainability of natural resources. Fortunately agroecology offers a distinct model of sustainable management. Other causes of shortfalls in some items include problems with the legal security of property and access to credit among others.

9. In spite of the positive aspects ascribed to it, the current model of economic growth as part of the globalisation framework is in crisis at present. Its collapse, both in financial and political terms, has generated a crisis without precedent in recent history. The global effects of this crisis include: (i) an estimated 200 million people have fallen into extreme poverty due to rising food prices (2005/08); (ii) there have been four crises of world food systems that can be characterised in two periods: the first (2006/08) caused by continuous increases in the international price of foodstuffs; and the second (2008/09) caused by the financial and economic crisis; (iii) according to World Bank figures, 75 per cent of people in situations of poverty globally live in rural areas and the majority of them are mainly engaged in agricultural livelihoods (World Bank 2008), (iv) the world financial crisis that began in 2008 and extended across diverse regions, such as the USA, the Free Associated State of Puerto Rico, the European Union (with a heavy impact on Greece and contributing to the British process to separate from the European Block), Japan and the countries of South America.
10. As Olivier De Schutter, the Special Rapporteur for food rights, points out in his report presented in the Human Rights Council's 16th session period,

Consistent with obligations assumed by States under international human rights treaties to take effective measures towards the realization of the right to food, food systems should be developed in order to meet the following three objectives: (i) food systems must ensure the availability of food for everyone, that is, supply must match world needs; (ii) agriculture must develop in ways that increase the incomes of smallholders; (iii) agriculture must not compromise its ability to satisfy future needs. (De Schutter 2010: 4-5)

In this context agroecology is introduced as a consistent model and concept for the design of future systems of agricultural exploitation, due to its scientific and practical roots and because of its close relationship to the principles around the right to adequate food and nutrition (section III).

II. Challenges in transitioning from conventional agriculture to agroecological farming in Nicaragua

A) Market Analysis and Market Policies

11. (INTRO) Currently there is no official data on Agroecological Production in Nicaragua. In fact, the most accurate information registered is the general information about organic production. According to the estimates of MAONIC, the Movement of Organic and Agroecological Producers (women and men), there are currently 28,000 agroecological farmers, including those involved in transformative processes towards agroecological farming. This is the equivalent of approximately 10-11 per cent of the nation's farmers.
12. (Q1) In 2016 Nicaraguan exports were made to 103 countries, making evident Nicaragua's important international commercial relationships. The commercial exchange with the USA represents 39.7 per cent of the total with an income of US\$570.8 million dollars. The volumes of products grew to 36 per cent with exports of oil and fats, cane sugar, golden (unroasted) coffee and cane molasses, among others (APEN 2016). Nicaragua's other commercial associates are El Salvador (second country); Costa Rica (third), and among the ten other main export relationships are with Guatemala, Honduras and Mexico.
13. (Q2) On an international level it is expected that for the period 2014 to 2018, the countries with the greatest potential for purchasing organic products will be China, which is registering the greatest growth in its sales of organic products, followed by Mexico, Brazil, Russia and France. Nicaragua has the possibility of exploring the markets emerging for organic products, since these are countries with which Nicaragua already has commercial relations.
14. (Q2). The progress taking place in Nicaragua is important. More than 70,000 hectares are now being farmed certified organic, or are transitioning to organic production. The farms are producing more than 30 products and involve work by more 7,000 small and medium-scale producers – men and women (FENACOOOP 2011). This production is expected to achieve an income from exports of more than 29 million dollars and the total value will exceed that figure, along with the positive social and environmental benefits and ripple effects that these activities generate. The main organic products in order of importance are: coffee, cocoa, sesame seeds, honey and cashews. According to the Nicaraguan Ministry of Agriculture 90 per cent of the country's certified organic production is exported with a very low or non-existent added value, which means the final high prices paid for these products in the marketplace stays with those companies that give them added value (Cussianovich and Altamirano 2005).

15. (Q2) The existing value chains for agroecological products are those that have an established place in international markets: coffee, organic meat, sesame seed, honey and cocoa. Despite the existence of these agroecological products in value chains, ‘the accumulated evidence indicates that value chain initiatives only reach out to a very small percentage of farmer’ (HIVOS iied. Information sheet, 2012, p.1). Several things should be considered in taking agroecological products from small or medium scale farms, through the different production phases to the final delivery to consumers. The following factors influence the price and positioning of these products: (i) the quantity of available products in the area; (ii) the relationship between supply and demand; (iii) product quality – the better the presentation and characteristics, the greater the value; (v) presence in the local market of products from elsewhere (in-country policies and international agreements).
16. (Q2) Organic Coffee. The World Coffee Organisation announced that in 2012 Nicaragua had become the fifth largest exporter of organic coffee, selling 100,913 60kg sacks, 14.5 per cent more than in 2011, when 88,102 sacks were traded (El Nuevo Diario 2013). In 2015 coffee was in second place among the main Nicaraguan export products with more than 395 million dollars of income. In terms of total exports agricultural and coffee exports in 2015 represented 46 per cent and 16 per cent respectively. The United States and the European Union are the main markets for Nicaraguan coffee (52 per cent and 22 per cent respectively). Other key buyer countries include Venezuela, Canada, Taiwan, and Japan among others.
17. (Q2) Growth in organic honey trade. In 2104 honey for export earned US\$1.4 million, an increase of US\$1.04 million (288.9 per cent) with respect to 2013. It is estimated that 55 per cent of honey production is organic. The sales of organic honey have grown significantly both in the national and international markets. These sales show a growth rate of 33 per cent in the national market, according to data from supermarkets. The German market has become the principal market for Nicaraguan honey absorbing 83 per cent in 2014. The western region of Nicaragua (León and Chinandega) is the main honey producer, which according to a recent study has 29.3 per cent of beekeepers, 37.3 per cent of the hives and 40.4 per cent of honey production. According to the National Apiculture Commission there are currently between 1,300 and 1,450 bee-keepers and six export companies. 85 per cent are small-scale and 15 per cent medium scale producers. 60 per cent of production is exported and 40 per cent is sold on the national market.
18. (Q2) Cocoa Organic trade. There are approximately 9,326 small-scale producers of cocoa (La Prensa 2015), mostly located in Río San Juan, Waslala, Rancho Grande, Tuma-La Dalia, Matiguás, Siuna, Bonanza, Rosita, El Rama, Muelle de los Bueyes, Nueva Guinea and Cruz de Río Grande (Bejarano 2015). Generally the export value of cocoa across its different classifications showed an annual growth rate of 8.1 per cent from 2008 to 2011. According to the Centre of International Export (CEI), the main organic buyer on a worldwide scale in 2012 was the European Union, mainly: Netherlands with US\$ 2,388 million, Germany with

US\$1,443 million, Belgium with US\$ 707 million, France US\$ 486 million, Spain with US\$ 271 million, United Kingdom with US\$ 383 million and Italy with US\$328 million. In second place is the USA with US\$ 1.468 million and in third place Asian countries, principally Malaysia, Singapore and Turkey (CEI 2012a).

19. (Q2) Organic sesame seed (CEI 2012b). This crop is grown primarily in the departments of Rivas, León and Chinandega, and to a lesser extent in Managua, Granada and Masaya. The largest scale areas cultivated are in León and Chinandega. The national prices paid to producers varied between C\$800 and C\$1,400¹ per quintal (hundredweight or 100kg) in the period 2010 - 2011. This is an increase of 60.5 percent. However the price paid in 2010, was US\$38.00 approximately, when the international price was at more than US\$60.00. Sesame seed was among the 20 main export products in 2011 at a time when sesame seed with husk 55.4 per cent made up of sales and 44.6 per cent was sesame seed without husks (refined).
20. The main buyer countries for Nicaraguan sesame seed with husk are Japan, Guatemala, Mexico, Honduras and Belgium. Other Central American countries that also buy sesame seed are El Salvador and Costa Rica. The main consumer markets for refined sesame are European countries such as the United Kingdom, France, Belgium, Italy, and Germany. In Central America the consumer countries are El Salvador, Costa Rica and Honduras.
21. (Q3) One of the factors that creates distance between the consumer and the producer is that production for the internal market is minimal, due to the low level of development of the local market. In the capital city, Managua, there are only 30 distributors of natural products, due to the fact that most organic products are destined for export to external markets stimulated by the offer of high prices.
22. (Q3) Among the benefits of local markets are: (i) the proximity of the places of production and consumption, (ii) personalised knowledge about the demand contributes to readjusting the productive offer based on local requirements, (iii) fair prices for products, (iv) absence of intermediaries, (v) contribution to food and nutritional sovereignty and security, (vi) stimulation of the local and municipal economies (vii) strengthened community interaction. Among the main challenges in fomenting permanent farmers' markets are: (i) gaining the support of local and national authorities, (ii) access to finance for their installation and maintenance; (iii) dissemination of the product offers and benefits generated; and (iv) cohesion of a base of small-scale producers with sustainable common goals.
23. (Q3) Although there is not a specific market defined for agroecological products there are advances in terms of markets for organic products, which can serve as a reference to identify

¹Nicaraguan Cordoba = 0.0332469 USD (2017-07-11)

all the possible markets in which agroecological products with a focus on the solidarity economy and fair trade could be sold.

24. (Q3) In spite of this, there are some successes currently, in which farmers markets are more stable and generate greater proximity between producers and consumer families. This evidence of stability includes farmers' fairs in Ocotal, Somoto, Estelí and Condega, El Rama, Diriamba, Chontales and Siuna (Guharay et al 2012). In order to develop this it is important to broaden these initiatives by involving the state in fomenting agroecological products. On the local level this should also include 'future sales'² as a modality in which small-scale production is bought by private enterprises, NGOs and local and national governmental bodies in order to distribute food assistance, school meals, emergency reserves and other actions.
25. (Q4) A prevalent figure in Nicaraguan agriculture is the 'intermediary'. Because of their own culture, comfortableness or lack of knowledge of markets and sales, farmers tend to sell their production to intermediaries without precise information about the prices that those who transform the products are willing to pay. 'These kinds of relationships diminish the capacity for negotiation and as a consequence result in low prices, incorrect weighing and punishment for 'badly processing' products in terms of humidity, inert or waste materials and bad presentation' (Guharay et al 2012: 3).
26. (Q4) The systematic presence of the intermediary in the cycle of trade for agroecological production generates an adverse direct impact since: (i) it makes agroecological production unviable; (ii) it annuls the possibility of direct participation in formal markets; (iii) it reduces the profitability of agroecological production because of intermediary pricing; (iv) it disincentivises collective and community action in favour of the establishment of territorial markets; and (v) it demotivates the exploration of new trade routes.
27. (Q5) The most important free trade agreement (FTA) involving Nicaragua is DR-CAFTA³ that came into effect in 2006. One of the impacts of this FTA is linked to the phenomenon of the contingent imports of basic products. When there is a scarcity of products because of structural or climate factors contingencies are opened up for the import of goods to satisfy the internal market. These actions evidently reduce product prices in the internal market and alter farmers' expectations. Generally these operations involve basic food products such as maize, beans, meat and rice, which are the principal products supplied by small-scale producers. The winners are the big producers and the losses due to the lower prices are sustained by small-scale farmers (SIMAS 2012a).

²Future sales (these are sales in which producers commit to selling their production directly to the buyer, by receiving advance funds. This sometimes facilitates credit for buying inputs.

³ Free Trade Agreement between the Dominican Republic Central America and the USA

28. (Q5) The Trade Agreement between Peoples ALBA-TCP (Bolivarian Alternative for the Peoples of the Americas) began in 2007 and represented an opportunity for Nicaraguan rural families to link into the international market. The most important products for export were meat, dairy, livestock, beans, coffee, sugar and others. Nevertheless currently the trade with Venezuela through ALBA-TCP has diminished considerably due to the economic difficulties that Venezuela is undergoing. According to Juan Sebastián Chamorro, Executive Director of FUNIDES (Nicaraguan Foundation for Economic and Social Development), there has been a huge reduction in exports to Venezuela which in 2016 were only 5 per cent of total exports after these trade relations were second in importance to the country in previous years.
29. (Q5) On 8 October 2009 the Nicaraguan ‘Law for the prevention of risks from living organisms modified through molecular biotechnology’ was approved and published in the official Gazette N°.67 on 13 April 2010 as Law N°.705. In the framework established by this law, the Risk Analysis Commission for Modified Living Organisms (CONARGEM), was created to evaluate the release of GM organisms (GMOs). To date there has not been a single authorisation to release GMOs nor to experiment for commercial ends. Nevertheless the Nicaraguan government is being lobbied by the Union of Agricultural and Livestock Producers (UPANIC) to release GM soya, among other crops. UPANIC is getting involved in the development of regulations for Law N°.705 as a way of making the law more flexible; in addition to UPANIC the other companies interested in liberalising the use of GMOs are Monsanto and Bayer CropScience, both of whom have presented requests which as yet have not been approved.
30. (Q6) In Nicaragua there is no public policy on price controls. Instead, the executive issues ministerial decrees to resolve specific situations and the fluctuations in prices that continually arise. The model of reference for pricing is determined by supply and demand, which is the traditional way local markets function; if the demand is greater, the price rises. This is particularly true of trade in basic grains; bean, maize, sorghum, rice and other items such as vegetables and potatoes. In this context price control is managed by the state through diverse mechanisms. One of which is called ‘contingency’, based on a decree authorising private enterprise to import a given product with a view to regulating internal prices. Authorisation for this is given by the MIFIC (Ministry of Foment, Industry and Trade). There are permanent contingencies as is the case for rice. It is important to point out that there are no state control or supervision mechanisms for this that consistently monitor prices. Another modality is the negotiation between sector organisations and the MIFIC, who sit down together to define quotas or other measures to address situations affecting a given sector.
31. (A1.Q3) Closing the gap with consumers on a local level. One key action to incentivise agroecological production is to reduce the gap between consumers and producers. The production planning process contributes to reducing the gap between consumers and agroecological producers (men and women). It takes into account the demand and the generation of diverse products for distinct sectors of the market and also increases participation

in formal and informal markets, with the effort to achieve greater quality, dissemination and visibility in all arenas. ‘Improving the operations of informal markets can give much better and far reaching results both for the farmers and for low income consumers in comparison with interventions in formal markets and value chains’ (HIVOS iied. Information sheet 2012, p.1).

32. (A2) The incentives to develop and implement strategies to foment local farmers’ markets in coordination with local authorities, can include (i) joint management of funds between the central government and development agencies, (ii) the inclusion of requirements for local farmers’ markets in municipal budgets; (iv) coordination with local communications media about the benefits of agroecological production; (v) coordination for the establishment of a platform that includes the representation of rural producer families, with the aim of promoting the initiative and identifying existing territorial productive capacities for covering the demand; and (vi) incentivising local buying by programmes for school meals or food aid for emergencies.
33. (A3) Strengthening of associate relationships. Small-scale producers are at a great disadvantage because of their lack of associative organisation and therefore they have little effectiveness and power in the value chains in which their products are raw materials. In general value chains are controlled by a reduced number of traders and powerful companies that can also promote a reduction in product prices. The small-scale producers will only have a greater capacity to negotiate prices in their favour if they improve their associative organisation and gather larger volumes of high quality produce (SIMAS 2012a).
34. (A4) Strengthening the Farmers’ Platform. At present important steps have been taken in organising the small and medium scale farmers sector. Nevertheless more is needed in terms of advancing the levels of organisational cohesion, which is fundamental. The consolidation of the peasant farmers’ platform is vital for the development of agroecology in order to achieve greater participation in key decisions on local and national levels. Moreover, the platform can also become a space in which to examine aspects of the commercialisation process such as: (i) market analysis; (ii) market identification and planning; (iii) writing up and implementing commercialisation plans; (v) strategy development for dissemination and sales; (vi) and (v) programme development for training and exchange for peasant farmers on commercialisation.
35. (A5) Alternatives to integrate agroecology in trade. Currently there is no national certification for organic products, although the agroecological movements are in the process of developing and legalising it with the State. Nevertheless, there is a ‘fair trade’ market that can be a channel for positioning products derived from agroecology. It is important that trade incentivises the adoption of agroecology. However, commercialisation is a means not an end, as the agroecological model aims for the integrated sustainability of all the systems (social, environmental, cultural, economic, and nutritional among others) linked with peasant families.

36. Fairtrade is an initiative to create innovative commercial channels, within which the relationships along the supply chain (between producers, ethical institutions and consumers) are organised to achieve the sustainable economic, social and environmental development with peasant families. In Nicaragua organisations with the FLO certification seal include the Global Village Association in Jinotega, the Union of Organic Coffee Producer Cooperatives (UCPCO) and the Organic Coffee Producers' Multisector Cooperative (Coomprocom). According to Ecomarkets – a project with presence in Central America and financed by the Swiss Embassy allied with organisations for sustainable agriculture and markets - the sale of organic and fair trade products in the US market has an annual growth rate of 20 per cent, with volumes of more than US\$10,000 million. For Canada the figure is more than US\$1,000 million. The European market's growth was estimated at 11 per cent in 2007 (Sandino 2008).
37. (A6) Alternatives in Public Policy. In Nicaragua there is already a normative framework with a strong emphasis on Agriculture Organic, but the normative schema needs to be broadened further and worked into a legislative framework that emphasises agroecology beginning from the local with municipal ordinances to create a national agroecology law. Also needed are Public Policies and laws that explicitly integrate peasant families in access to credit, incentives, the generation of capacities, the recuperation of native seed stock, the recognition and documentation of peasant knowledge, the incorporation of small and medium producers in national decision-making structures, and the creation of programmes and grants for young rural people, among other aspects.

B) Natural resource management.

38. (INTRO). Studies carried out by Nicaraguan environmental organisations on current forest coverage have taken MAGFOR's official 2011 figures on soil use, which were updated in 2016. These figures have been used to determine the reduction of open and closed broadleaf forests by more than 36,000 hectares, and in second place a reduction of more than 6,000 hectares of open and closed pine forest, for the priority departments of Madriz, Boaco, Nueva Segovia, Estelí, Chinandega and Jinotega (Sandino 2008).
39. (Q7) The cultivation of the African Palm has generated large-scale adverse impacts in Nicaragua, among which are: (i) the fragmentation of ecosystems; (ii) the loss and degradation of biodiversity; (iii) contamination of water sources; (iv) soil degradation; (v) changes in the use of soils; (vi) conflicts about land ownership; (vii) the abandoning of traditional productive activities and (viii) an increase in poverty among communities. Studies carried out by the Foundation for the Conservation and Development of the Nicaraguan South-East (Fundación para la Conservación y Desarrollo del Sureste de Nicaragua) reveal historical data that shows that African Palm was introduced into the municipality of El Castillo, Río San Juan in 1984, but it wasn't until 1988 that the first reliable figures were obtained based on topographical mapping published by INETER that showed the existence of 1,373.0 hectares. By 2002, 14 years later, the area had increased by 87.7 per cent to 2,579

hectares. This expansion occurs to the detriment of forested areas (41.4 per cent) and agricultural land (58.4 per cent). Over a period of 7 years (2002-2009), palm cultivation expanded by 92 per cent, over 2,371.4 hectares to the detriment of fallow scrubland (48.6 per cent) agricultural land (28.6 per cent) and forests (22.8 per cent) (Fundacion del Rio 2011).

40. (Q7) In Nicaragua, the production of Sugar Cane, is focused in rural areas in the Pacific region such as: Chichigalpa, El Viejo, Chinandega, Belén, Potosí and San Rafael del Sur. According to figures from the National Commission of Nicaraguan Sugar Producers (CNPA), there are more than 800 private cane producers and four sugar mills, which generate more than five percent of the Gross Domestic Product, with agricultural investments of more than 200 million dollars. During the 2013-2014 agricultural cycle the area of sugar cane crop was 101.63 thousand *manzanas*⁴, Six percent more than in 2012-2013 when it reached 95.90 thousand *mz.* 58 per cent of this area belongs to the sugar mill plantations and the remaining 42 per cent to independent producers, according to the CNPA. It is estimated that for the 2014-2015 cycle the area dedicated to sugar cane will be 105 thousand *manzanas*, 3.3 per cent above the previous season and 44.6 per cent in relation to 2006-2007. The sugar mills generate diverse products including molasses, ethanol, rum, and drinkable and industrial alcohol in addition to selling energy to the national electrical grid system. The sugar processing factories generated more than 500 million kilowatt/hours during the 2013-2014 cycle, of which 277.7 million were sold to the public grid, equivalent to 15 per cent of national consumption.
41. (Q7) Sugar cane cultivation evidently has a tendency to grow especially because of the high demand for agricultural fuel. According to independent studies in Central America (Baumeister 2013) between 1990 and 2010 the area producing these two items more than doubled. In Nicaragua this represented a growth of 37 per cent, for a total area of 428,056 hectares.
42. (Q7) Another factor that has a strong influence over the sugar cane sector is the so-called Public-Private Alliance, which has consolidated the cane-growing sector as one of those with the most political influence in the country (Baumeister 2013). Production is done by four mills, three of which belong principally to national investors (*Ingenio San Antonio* of the Pellas family; CASUR linked to the Cuadra Schutz family, *Montelimar* also belonging to Nicaraguan investors, and the *Ingenio Monterrosa* acquired by Guatemalan capital, whose production of sugar and buying up of land has grown at an accelerated rate in the last few years).
43. (Q7) To date sugar cane has generated multiple negative effects that go beyond the economic benefits declared by National Commission of Nicaraguan Sugar Producers (CNPA), among

⁴A 'manzana' (mz) is 6,988.96 m²

these adverse impacts are: (i) the erosion and contamination of soils; (ii) atmospheric contamination caused by the practice of burning the cane; (iii) contamination of surface and subterranean water sources with agricultural chemicals and residual water; (iv) increased conflict with indigenous communities about land ownership; (v) impacts in the health of both workers and the surrounding communities (respiratory diseases, chronic kidney insufficiency, severe and chronic intoxication, congenital deformities); (vi) competition and conflict about the use of water; (vii) degradation of biodiversity.

44. (Q8) One of the causes of the lack of monitoring and application of the laws by the regulatory bodies in charge of protecting the environment and natural resources is that only 0.67 per cent of National Budget (*Presupuesto General de la República*) is assigned to this area. A report published (Popol Na et al 2016) about ‘Nicaragua’s post-drought socio-environmental crisis 2016’, indicated that in 2016 the National Assembly approved a severely reduced budget compared to 2015, something which generated a budget cutback of 29.6 per cent for the National Forestry Institute and 7.6 per cent for the Ministry of the Environment and Natural Resources.
45. (Q8) Since 1998 Law 290 (Law for the organisation, competence and procedures of executive power) has proposed the decentralisation and de-concentration of power among government bodies, with the understanding that de-concentration means the delegation of functions from the central Ministries to their territorial delegations. The law also delineates the role of district and municipal delegates. Decentralisation refers to the delegation of functions to the municipal governments. This includes direct delegation from the Ministries. Decentralisation appears among the national priorities of the ‘reconciliation and national unity’ government (SETEC June 2007) as a cross-cutting strategy, highlighting the importance of the municipal governments and the autonomy of the Caribbean Coast. However, these processes of decentralisation and de-concentration especially in INAFOR and MARENA, received very little guidance and accompaniment and generated an increase in illegality and a lack of control over natural resources.
46. (Q8) A report published in 2008 about the ‘Strategy for the Decentralisation of Responsibilities for Forestry Linked to the National System of Forestry Verification in the Municipalities and Autonomous Regions’ (INAFOR 2008), revealed that (i) there are insufficient staff for the Caribbean Coast and for some areas of the Pacific region; (ii) the delegates request more training, accompaniment and support in general from central office; (iii) there is no clear segregation of functions; (iv) the most difficult responsibilities for the municipal delegations are the investigations, trials and sanctions for administrative crimes, (v) the lack of clarity about the division of roles and functions and as a result overlaps in practice; (vi) the weakest links are the control over who is allowed environmental licenses and also the regulation of changes in the use of land; (vii) capacity and institutional solidity

is suffering in all arenas because of the changes in staff and (viii) there is insufficient budget to carry out adequate regulation.

47. (Q8) Environmental law has developed various principals to regulate and guide environmental justice, in parallel with State structures, such as the way in which natural resources are used (Caferrata, 2004, Carmona-Lara, 2006). Nevertheless there are two major challenges: active citizen's audits and their expedite application by the judicial authorities, and – the greatest challenge of the moment – the full understanding of environmental crimes by the judiciary. According to the Ombudsperson for the environment, José Luis García, 'because of their scientific complexity environmental crimes tend to be confusing for the judiciary at the moment of applying the law' (Asamblea Nacional 2012).
48. (Q9) Article 27 of the Political Constitution of Nicaragua establishes the right of all people to equality in the eyes of the law, and equal protection. There is to be no discrimination for reasons of birth, nationality, political belief, race, sex, language, religion, opinion, origin, economic position or social condition. Nevertheless, for peasant families there are two obstacles to access to the justice system and the approval of public policy: (i) insufficient understanding of the legal framework and a lack of knowledge about the functions and competencies of the bodies that make up the judiciary; and (ii) the absence of a cohesive organisation that advocates for the needs and proposals of peasant families in the formulation of public policy and legislation.
49. (Q9) The Nicaraguan State has taken important steps forward in typifying crimes against the environment and natural resources with the approval of the Penal Code (Law N°.641 Official Gazette N°.83. 05-05-2008). Environment crimes were incorporated into this law under Title XV, of article 363 onwards; and in the section on offences in Book Three, which includes noise contamination in article 534. The Penal Code covers a series of environmental issues including: (i) construction in prohibited places, (ii) non-compliance with environmental impact studies, (iii) illegal use of natural resources, soil, water, atmosphere, toxic and dangerous waste, residual waste and water; (iv) closed seasons for fishing, hunting for animals in danger of extinction, trade of plant and animal wildlife, mistreatment of animals, forest fires, felling of trees, use and closed seasons on forestry resources; (v) transport and trade of illegal wood, cutting or pruning trees in the urban area, spray-painting, decoration, alteration of natural and urban landscapes with signs, publicity, antennas, posts and transmission towers for electrical energy and communications, without having the corresponding authorizations. Included among the sanctions are imprisonment and fines that are differentiated depending on the status of the perpetrator of the crime as an individual or part of an entity with legal status. It also includes work to benefit the community, the suspension or cancelation of activities, the seizure of tools and products that have resulted from the illicit activity; special disqualification for exercising a profession, trade, activity or right related with criminal behaviour (El Nuevo Diario 2008).

50. (Q9) As a result of the Classification of Environmental Crimes in the Penal Code (Law N°.641) citizens now have three places in which to make complaints: (i) the Ministry of the Public Prosecutions (Ministerio Público), (ii) the Centre for Prosecution Services (or District Attorneys) (Centro de Atención Fiscal) located in National Police stations and (iii) the Office of the Prosecutor General of the Republic (Procuraduría General de la República). However, according to the Attorney General of the Republic of Nicaragua (Fiscalía General de la República de Nicaragua) ten per cent of complaints come from the police and 90 per cent are investigated independently by the Attorney General (Centro Humboldt 2012), as long as they have the complete coordination and inter-institutional information necessary to ensure investigations contain all the technical information necessary to carry out an effective legal process. It is evident from this that the citizens are not exercising their right to present complaints against individuals or legal organisations that commit environmental crimes, possibly because of a lack of knowledge about the legal mechanisms, mistrust of the judicial system or indifference towards crimes that don't affect them directly or immediately.
51. (A7) Strengthening capacities and the generation of knowledge. On a local level it is essential that the capacities of rural families and indigenous communities are strengthened in relation to environmental laws and the processes, institutions and mechanisms for complaints, both administrative and criminal. A key strategy also involves closer relations with local authorities and territorial delegates (where this is relevant) for the process of monitoring and audits by peasant farmers of the natural resources and environment in their territories. It is equally important to create closer ties with the local judiciary and bodies such as the Attorney General's office and the Environmental Ombudsperson's Office.

C) Comparative economic profitability and environmental impact of agroecological and conventional farming

52. (INTRO) Agroecology has to do with the capacity of agriculture to contribute to the wellbeing of people over the long term (UNDESA/DSD 2000), by guaranteeing the fundamental pillars of sustainable development, among which are: economic growth, social equity, and environmental protection through practices that are economically effective and profitable, socially responsible, culturally acceptable and respectful of the environment.
53. (INTRO) Some sectors associate Conventional Agriculture with the growth of Nicaragua's Gross Domestic Product, and because of this, assume that GDP growth from US\$10,460.9 million (2012) to US\$11,805.6 million (2014) is an effect of Conventional Agriculture. This is not the case however, as the calculations do not factor in the large external costs to the country caused by Conventional Agriculture. In fact, multinational companies and large-scale producers have been promoting the same unsustainable agricultural model for years,

only changing its name using terms like ‘precision agriculture’ and ‘climate-smart agriculture’ among others. (Francisco Salmerón Miranda, UNA/SOCLA, 2017)

54. (INTRO) The Conventional Agriculture model has always had monoculture export production at its centre: (i) first with livestock (after the independence of Guatemala and Mexico) which generated the expropriation of indigenous communities; (ii) coffee (in the 1950s); (iii) cotton (as an effect of the Korean war); (iv) sugar cane and African palm (as an effect of the demand for agricultural fuels) at present also peanuts, and each new cycle is even more aggressive. (Francisco Salmerón Miranda, UNA/SOCLA, 2017).
55. (Q10) Among the negative characteristics of the Conventional Agriculture Model are: (i) the development of monoculture (ii) high dependence on technologies, (iii) high use of agricultural toxins and fertilisers; from 2012 onwards there has been a significant rise in imports of chemicals and fertilisers; (iv) excessive exploitation of water resources; irrigation pumps, dams; (v) soil degradation; resistant new pests (effects of the model); (vi) radical extractivism producing environmental damage and the violation of human rights; (vii) the generation of inequalities and the centralisation of decision-making power about this model; and (viii) the crisis of the consumer and lifestyle models. (Farmers’ Jury Deliberative Workshop).
56. (Q10) The Agroecological Model has a series of distinct characteristics. (i) It integrates natural and social processes and brings together hybrid disciplines such as political ecology, economic ecology and ethno-ecology among others. (ii) It uses an integrated and interdisciplinary approach, conceptualising agricultural systems as socio-ecological systems. (iii) It is not neutral but self-reflexive, which enables criticism of the paradigm of conventional agriculture. (iv) It recognises and values the local wisdom and traditions and proposes the creation of dialogue with local actors through participatory action research, which enables the constant creation of new knowledge. (v) It adopts a long-term vision that contrasts strongly with the short-term and atomised vision of conventional agriculture, valuing wisdom and proposing a dialogue of knowledges (Francisco Salmerón Miranda, UNA/SOCLA, 2017).
57. (Q10) The calculation of the economic viability of conventional agriculture does not take into account all of the addition (external) costs and hidden subsidies. These include: costs to the health system derived from exposure to chemicals (in Nicaragua this represents an estimated nine million dollars a year due to severe intoxication); the loss of wildlife; environmental reparation (de-contamination of water sources, soil and ecosystems); the increase in quantity and frequency of pests that are resistant to agricultural toxins; and the erosion and diminished productivity of soils. In the process transition, as a result of the elimination of contaminating and dangerous toxic inputs, the costs associated with

contamination are logically reduced. In all of this, the valuing and preservation of natural resources represents, in the long term, the greatest economic advantage (Castaneda 1994).

58. (Q10) In terms of productive systems the performance of agroecological and conventional systems is similar according to diverse experiences in the region. ‘The advantage of agroecological [farming] is that, by avoiding the buying of inputs, the total monetary production costs is reduced by between 15 and 20 per cent and this increases the margin of profitability’ (INTA informa 2015). In a study on the profitability of agroecological techniques developed by Jules Pretty outcomes were compared among 286 recent projects applying sustainable agriculture in 57 impoverished countries over a total area of 37 million hectares (3 per cent of the area cultivated in developing countries). The researchers concluded that these interventions had increased the productivity of 12,6 million farms, with an average of 79 per cent increase in harvests while also offering essential environmental services (Pretty et al 2006). The breakdown of data from this research indicates that average food production per home increased by 1.7 tons per year (up to 73 per cent) for 4.42 million small-scale farmers growing cereals and tubers on 3,6 million hectares, and by 17 tons per year (up to 150 per cent) for 146,000 famers growing tubers (potato, sweet potato and cassava) on 542.000 hectares.
59. (Q10) The transition from the conventional to the agroecological model presupposes some challenges, since any change requires adjustments in some systems. However, this should be assessed on a case-by-case basis, since each territory and each productive system has its particularities. The transition is carried out over a defined time period and is done through a series of steps, which aim gradually to increase system efficiency, reduce damaging inputs and redesign the farm. During (and beyond) the transition period careful observations must be done, with a register of what has happened and with constant experimentation. This enables correct decisions to be made about equipment, cultivation, cultural work, etc. (Zamora Torres 2011).
60. (Q10) The transition process (Castaneda 1994) from the conventional to the agroecological model is not easy. Peasant families identify diverse challenges that affect them to a greater or lesser degree, since the agroecological transition is a gradual and complex process that articulates different dimensions (farm, community and society in general) and is affected by a wide variety of social, economic, technological, cultural and ecological factors. From an ecological standpoint (i) depending on the degree of specialisation and intensification that has taken place on the farm, greater or lesser efforts must be made to eliminate synthetic chemical products, reorder the flow of nutrients and energy, and reintroduce biodiversity (hedgerows, rotations, poly-cultures, agricultural and livestock integration...). (ii) On an economic level the transition involves issues related to the access to credit, land ownership and the generation of the national demand products. (iii) Socially, this requires the existence of support structures, technical assistance and exchanges of experience.

61. (Q10) A wide range of studies has demonstrated that ecological agriculture contributes to increasing the abundance and diversity of local species. The effects vary depending on the taxonomic groups, the characteristics of the territory, and the context and intensity of the production systems. In a study across 66 publications, Bengtsson et al. (2005) determined that beneficial organisms were 50 per cent more abundant and that species diversity was 30 per cent greater in organic agriculture systems than in conventional agriculture systems. The species of birds, predatory insects, soil organisms and plants responded favourably to agroecology, while pests were reduced.
62. (Q10) An essential part of agroecology is the way surface soils develop under organic management, as they have high rates of return from residues or inputs of organic material. They generally have higher levels of organic soil material (Franzluebbers 2004, Kong et al, 2005, Marriott and Wander 2006), which greatly contribute to better soil quality with respect to some ten critical interrelated aspects. These include: the biogeochemical cycle; retention of nutrients, formation and stability of soil aggregation; infiltration of water and capacity for water retention, water decontamination, PH balance, the reduction of erosion and the growth of plants (Mäder et al, 2002, Weil and Magdoff 2004).
63. (Q10) Conventional system models, especially for grains, have drastically diminished the efficiency of fertiliser use, creating the need to apply ever-increasing amounts of synthetic fertilisers just to maintain crop performance. This also increased losses of nutrients (Tilman et al., 2002, Miao et al., 2011), the loss of nitrogen and agricultural phosphorous, problems for environmental and human health, the eutrophication of fresh water, and greater emissions of greenhouse gases (Tilman et al, 2002, Townsend et al, 2003, Díaz and Rosenberg 2008, Park et al 2012).
64. (Q11) As the predominant model industrial agriculture currently generates macroeconomic growth but has a gradual impact on the key bases of the country's development, including; (i) a reduction in the quality and health of the soil's nutrients with repercussions for future productivity, (ii); greater local and global climate change and the reduction of resilience; (iii) the degradation and loss of biodiversity and human health problems due to the indiscriminate use of pesticides; (iv) perpetuation of dependency because the basic needs of peasant families are not satisfied.
65. (A1) In strengthening local transition processes, it is important to develop closer relations, collaboration agreements, and/or technical exchanges with academic institutions, research centres and government bodies for technological development, that contribute to technical advice and accompaniment during the transition phase.

66. (A2) The social challenges, more than the economic ones, are key. This means encouraging training, leadership, schools and dialogue between different types of knowledge. Schools cannot continue to promote the conventional model of production.
67. (A3) It is important to address the social environment by promoting organisation and training, discussions on the agricultural models, field visits, local markets, exchanges and debate. It also is essential to consolidate relations between the chain of stakeholders including: rural families, promoters, coordinators, facilitators, academics, and government. In addressing the economic aspect, it is fundamental to reach out to consumers and campaign for changes in production and lifestyles.
68. (A4) Develop closer relationships and alliances from national to local levels (or the other way round, depending on the circumstances) with key bodies such as: the Ministry of the Family, Community, Cooperative and Associative Economy (MEFCCA); the Nicaraguan Institute of Agricultural and Livestock Technology (INTA); the United Nations Food and Agriculture Organisation (FAO); The Inter-University Council for Food Sovereignty and Security (CIUSSAN); the Parliamentary Front Against Hunger –Nicaraguan Chapter (PFH-NC); the National Universities Council (CNU); and Municipal Governments.

D) Land ownership and Policy

69. **(INTRO)** In Nicaragua agriculture is the main economic and development activity. As a result, land ownership plays an important role in power relations and defines who establishes the political and economic agenda. Land ownership has undergone several stages of change since 1980. The first normative instrument in terms of land ownership was Decree N° 782, issued by the National Reconstruction Council (Junta de Government de Reconstrucción Nacional) on 2 May 1981, which aimed to: ‘Guarantee landed property to all those who work productively and efficiently’ (Article VI). It could be said that by 1986, a Leninist form of socialist land distribution had taken place, given the data from that year which reveals that the area given individual titles represented 8 per cent of the land, while the state-owned sector was 50 per cent, and the cooperatives 42 per cent (FUNIDES, 2011: 5).
70. (Q12) The Nicaraguan Foundation for Economic and Social Development (FUNIDES), points out that cultivated areas increased in Nicaragua between 1963 and 2011, by the shift in farming areas from 5.4 million *manzanas*⁵ to 8.9 million (ibid: 11). Land ownership continues to be concentrated in few hands: the segment of 500 *manzanas* or more continues to prevail as the largest portion of farms in terms of quantity of *manzanas* with a single owner (18 per cent), while the strata of 0.5mz to 5mz only covers 3 per cent of the total quantity of land (ibid: 11).

⁵A ‘manzana’ (mz) is 10,000 square ‘varas’ or 6,988.96 mt²

71. (Q12) Of the total area for cultivation around 70 per cent of the land is privately owned. However, the agricultural producers that have their titles registered are only 49 per cent of farmers. Similarly, between 35 per cent and 60 per cent of all the land is involved in conflicts over property and it is estimated that 30 per cent of rural land has no legal documents, with an incidence much higher among small and medium-scale farmers.
72. (Q12) In Nicaragua slightly more than 20 per cent, or a fifth, of all national territory, agrarian land or otherwise, has been registered and duly measured locating the plots of land marked within precise geographical boundaries. Slightly more than 20 per cent means an area that covers the whole of the Pacific region and some departments of the Central Region. (Martí i Puig and Baumeister 2017)
73. (Q12) Currently the process of land registry and measurement is still incomplete, with the exception of the Pacific strip. That is Chinandega to Rivas and some departments of the central region around Estelí and Madriz. The remaining areas, mostly the Caribbean Coast regions, are far from beginning with the registry process (Martí I Puig and Baumeister 2017).
74. (Q12) The situation is so severe, that at least every second property cannot be sold, mortgaged, used as a guarantee for a loan, inherited, rented or given away, without altering the rights of third parties. The insecurity in land ownership is a fundamental obstacle to the (i) reinvigoration of agriculture, (ii) the promotion of investments and the (iii) transition to an agroecological model on a national level. The problem is so serious that there is no certainty, nor exactitude about the amount of land registered in the Property Register. Estimates are that they cover between two to six times the territorial area of the whole country, as there are properties registered with two or more owners, which demonstrates the level of disorder and anomaly in the records (Martínez Espinosa and Avellón Castellón 2015). According to data published by INETER (2016), only 17 per cent of Nicaraguan territory is properly registered. Other estimates point out that approximately 50 per cent of titles to property have some doubt about their legitimacy, especially in rural areas (Sandino 2006).
75. (Q12) The fundamental challenge for land ownership in Nicaragua is the legal insecurity of property. This situation, as the Programme for the Ordering of Property (PRODEP) indicates, causes the following problems. It (i) limits access to credit for production; (ii) produces little or no long term investment in the farming sector; (iii) increases land grabs; (iv) increases the number of conflicts; (v) delegitimises land titles, produces higher costs and longer delays for legalisation; (vi) creates a lack of information for national and municipal planning; (vii) contributes to the degradation of natural resources; (viii) creates less confidence in the institutions and (ix) causes a duplication of efforts by institutions.

76. (Q12) Among other key factors in land ownership the following can be found. (i) Currently there is a superimposition of titles on the same lands in the hands of different people. (ii) The national State has made advances in issuing land titles through the Prosecutor General of the Republic (PGR) issuing a considerable number of property titles in rural areas (69,862 between 2007 and June 2015). (iii) Currently it is calculated that the areas of farms has doubled since 1963, when the area in the census was 5.4 million *manzanas*, a figure that reached 8.5 million *manzanas* in 2011, showing the expansion of the agricultural frontier into nature reserves or areas of natural biodiversity. (iv) The process occupying territory has increased over the last decades. (v) There is a large sector of land rentals, estimated at around 100,000 small-scale farmers who work on rented land. (vi) Women's access to land is much more limited than men's, although some advances have been made over the last few years. According to the 2011 Agricultural Census, 22 per cent of farming land has titles naming women as the main owner, which means 78 per cent is under titles issued to men. (vii) According to information from the National Commission for Demarcation and Land Titles (CONADETI) the indigenous territories that have undergone demarcation and titling in the Autonomous South and North Atlantic Regions and others located in the department of Jinotega cover 37,843 square kilometres, or close to 32 per cent of the country's land. These territories need to complete the phase known as *Saneamiento* or Clear/Quiet Title that refers to the resolution of conflicts over boundaries including those who possess land but do not belong to the ethnic groups (indigenous or afrodescendent communities) of the Atlantic Coast. (viii) Even when the country has the largest landmass in Central America, the size of the gross value of agricultural production is the smallest in the region.
77. (Q12) Among the main challenges identified in relation to land ownership are: (i) the weak and dispersed legal and institutional framework; (ii) the lack of coordination between institutions for farming sector and for property before or after the regularisation of specific areas; (iii) delayed and expensive legalisation processes; (iv) land grabs; (v) the lack of demarcation and titles of indigenous lands; (vi) the lack of registry and demarcation of protected areas; (vii) distortion in the land market; (viii) irregularities and absences in the land and property registry; (ix) inconclusive legalisations; (x) changes in the use of soils and inadequate use of the same; and (xi) increased demand due mainly to the duplication of titles of beneficiaries and other related aspects.
78. (Q12) Small and medium-scale farmers in Nicaragua when seen collectively, have more important weight in terms of land and production than they had in the past. In 1978 the area occupied by them was eight million *manzanas*, while today this is around ten million *manzanas*, an increase in absolute terms (Baumeister, 2017)
79. (Q12) According to the study 'The Concentration of Land and Food Security in Central America' (Baumeister 2013) there is a re-concentration of land in Nicaragua in the hands of foreigners. This phenomenon is attributed to the need to produce agricultural fuels, and

particularly for sugar cane and African palm, livestock, forestry production and beach-based tourism. This study also examines the strong presence currently of small and medium farmers coexisting with expanding private groups; with the presence of regional capital in agro-industry; and partly in direct control of lands. The presence of Mexican, Salvadorean, Guatemalan and Costa Rican capital shows that regional resources have both direct control over production, and over the sphere of agroindustry and trade. The land is also under pressure from national and foreign capital because of the expansion of tourism, mining and forestry plantations.

80. (Q12) The social structure that is reflected in land ownership is made up of two kinds of producers, (i) those working with their families and (ii) those who hire permanent farm workers. The majority of farmers are reliant on their own labour and as such are small-scale producers: 65 per cent of the agricultural social structure are farmers who work individually or with their family; there is a small sector who are the employers representing only 1 per cent of Nicaragua's agricultural social structure and a third (33 per cent) who have no independent access to the land, and do not have land of their own (Marti I Puig and Baumeister 2017).
81. (Q13) In a study carried out jointly by the International Coalition for Access to the Land (Coalición Internacional por el Access a la Tierra) Nitlaplan-UCA (Research Institute from the Central American University), 40 per cent of rural families have no secure access to the land. Women are those who have the least access: 1.1 million live in the countryside but 23 per cent of them own land (Nitlaplan-UCA 2017).
82. (Q14) Another element that is influencing the way in which land ownership is restructured in the country, is the land market. This is influenced, according to Eduardo Baumeister, by diverse factors, among them: (i) the continuous advance of the agricultural frontier (ii) forestry projects⁶; (iii) the increase in the production beef cattle; (iv) the corralling of cattle; (v) the expansion of monoculture; and (vi) beach tourism (Marti I Puig and Baumeister 2017).
83. (Q14) On the other hand, in these areas of the land market the legalisation of the properties is not necessarily a

sufficient incentive for the stabilisation and long term investment in small-scale farmers or producers, since the tendency is to sell and advance the agricultural frontier. The dispersion of the institutions involved in the legalisation process for properties is a limiting factor for peasant farmers and producers as it requires lengthy procedures to formalise the status of their property, which means high economic costs and available time.

⁶These have diverse aims: to produce wood, obtain carbon capture certification, general usages and energy sales.

(Chaput, 2011:14)

84. (Q15) ‘Secure access to land for young people is a key factor in empowerment and social recognition, and for exercising their role within their families, communities and organisations, as well as a way to diversify their strategies and life projects’ (Procasur and ILC, 2014: 6). This is one of the conclusions of the study on access to land and life strategies for young rural people, carried out by the FAO as part of the initiative promoted by the International Land Coalition-Latin America and the Caribbean (ILC-ALC), in collaboration with the Corporation Procasur. At the same time the study determined ‘young people have few possibilities to accumulate the income necessary for buying land and are frequently excluded from financial services. They are also invisible in Public Policy and as relevant stakeholders for the development of rural territories’ (ibid: 7); these factors, among others, contribute to the migration of young people.

85. (Q15) In Nicaragua migration is a livelihood strategy which may entail two types of migration: temporary and permanent. Permanent migration predominates among urban populations, while in rural areas seasonal migration is more common (Baumeister, E.; Fernández, E. & Acuña, G., 2008). Internal migration follows three routes: (i) towards Managua; (ii) from dry rural areas towards wetter rural areas; and (iii) towards urban areas in the central region and on the Caribbean Coast.

86. (Q15) The concentration of land and the limited access to the same motivates migration towards the cities and other countries and causes a search for land that expands the agricultural frontier, provoking environmental degradation due to deforestation and the replacement of forests with pasture for cattle (FAO and World Bank 2008). Recent studies carried out by the Faculty of Economic Sciences of the Autonomous National University (UNAN-Managua) referring to migration and migratory flows, found that the Nicaraguans who most emigrate to other countries looking for better living conditions, tend to come from the Pacific region (44.1 per cent) and mainly from the department of Managua (13.5 per cent). The study also found that this migration is more urban than rural and is a constant behaviour over time. According to these results 63.6 per cent of the population come from urban areas and 36.4 per cent from rural areas.

87. (Q15) An important effect generated by migration is the loss of a social layer of adolescents,

The migratory destinations of the rural population in the Central American region is linked to the fact that peasant families take advantage of harvest periods, in which there is a higher demand for labour and salaries are much more attractive than what is offered in Nicaragua. For migrants coming from rural areas, a tendency towards a migration flow of men reappears, due of the opportunities opened up for rural

adolescents in agricultural harvesting and building activities in Costa Rica, Guatemala and El Salvador
(Padilla Velasquez, 2015: 181-182)

88. (Q15) These groups of emigrants make important economic contributions to the country through remittances;

The dollar amount sent from poor Nicaraguans to their families, who are also poor, has duplicated between 2007 and 2015, which means there are more migrants seeking employment outside the country. With close to 1,200 million dollars in remittances last year, incomes have almost tripled with respect to the main national export items (Samcam, 2014)

89. (Q15) According to World Bank studies, Nicaragua is a country in receipt of a substantial quantity of remittances, between 15 per cent and 20 per cent of the GDP and representing two thirds of export income. Around 15 per cent of Nicaraguan homes receive some kind of remittances from outside the country, and 17 per cent of homes have a member living permanently elsewhere (Padilla Velasquez 2015). The use of remittances in the rural area as a product of migration, according to Delphine Prunier's (2011) study has different ends, including (i) the payment of debts acquired in travelling to the foreign country; (ii) daily consumption and spending by the families, who are in a very precarious economic situation and have very little income from production and other sources; (iii) other uses of the remittances are for improving housing, (iv) payment for education, (v) savings and (vi) investment in production, with the main emphasis on buying inputs or when at another level, covering the cost of buying or renting land, paying for labour and buying cattle.

90. (A2) Promoting the implementation of Law N° 717, 'Law for the creation of the fund to buy land with gender equity for rural women', approved on 5 May 2010 and published in the Official Gazette N° 111. This is a key joint action by both the National Assembly and the 1 Producers (Let's Produce) Bank. The latter's main aim is to foment production among micro, small and medium-scale producers in the agricultural, livestock and industrial sectors⁷ (Article 3), as well as 'To design particular policies enabling women and young people to access loans needed to contribute to fomenting production (Article 3, section 6).

91. (A2) In fomenting community investment to reduce the migration of young people and help families stay in their places of origin, it is important to create enabling conditions in the area after land has been purchased. This can be done through a joint strategic response by the local authorities and organised small farmer families.

⁷ Law No. 640, Approved on the 6th of November 2007

E) Young people, continuity in farming and agroecological knowledge

92. **(INTRO)** At present, Nicaragua is in a ‘demographic bonus’ situation; in other words, in a phase of late expansion of its population. The current population that is economically active, especially young people, is growing rapidly. This means that, according to projections and estimates (United Nations 2009), out of a population estimated at between 5,8 million and 6,2 million, the active population is between 3.5 and 3.9 million people of working age, the majority of them in rural areas. This translates into an activity rate (the inverse of dependency) of between 1.6 and 1.7 million. This activity rate will continue to increase until 2035-2040. This opportunity gap is very important for initiating actions to foment agroecology as a predominant sustainable development model.
93. One key factor is the growth of the rural population. Since 1995 this growth tended to become stabilised, but in 2006 (INEC, 2006) it was observed that it had multiplied by 2.3 in comparison to 1970 (year of reference), confirming, in absolute terms, that the rural population has not stopped growing. Both the ‘demographic bonus’ and the sustained growth of the rural population, present a valuable opportunity as an elevated rural and economically active population has an important weight in the national economy and requires strengthening with assets in order to produce employment alternatives or income generation to satisfy its material, educational and recreational needs.
94. (Q16) The lack of work opportunities in rural areas causes demotivation, which contributes to young people’s desire for migration. Nicaraguans migrate internally, mainly from rural areas to urban and also internationally towards countries with different demographic structures where there is a demand for cheap labour. Census data indicates that around 52 per cent of internal migrants between 1995 and 2005 were women, who also made up 42 per cent of the country’s international migrants in 2005. In Latin America and the Caribbean, the family context seems to be a crucial factor in women deciding to migrate. Similarly, the reasons for migration for the first time is a family decision (56 per cent). 27 per cent of men say they have emigrated in order to increase their income, in comparison with only 15 per cent of women (World Bank 2008b).
95. (Q16) There is also a market migration of Nicaraguan young people who leave the rural areas. This has multiple causes, but one determinant that has a substantial influence is the contemporary process by which the rural area is subject to transformations imposed by globalisation. It is important to highlight how globalisation contributes to cultural homogenisation to such an extent that urban goals and desires have expanded into the rural environment; although in the same way, the values and lifestyles of the rural areas have been re-valued (Barrere, 1988). One can also add to this context other determinants such as: (i) the lack or scarcity of employment; (ii) the absence of institutions for secondary and higher

education in rural areas; (iii) the scarcity of services; (iv) limited technological development; (v) the gradual substitution of cultural identity; (vi) limited access to credit; (vii) the degradation of natural resources; (viii) climate change; and (ix) the idea that agriculture is less profitable in comparison to other work.

96. (Q16) Young people from peasant families value two key factors that influence their motivation in promoting agroecology. These include, in the first place (i) their parents' overprotection, centralised decision-making and lack of transference of knowledge to them. This generates insecurities among young people about their participation in key spaces and decision-making. In the second place (ii) the lack of opportunities for young people in the framework of the Nicaraguan Government's Public Policy (Deliberative workshop, Farmers' Jury).
97. (Q17) The current government's plan is oriented towards a School of Technology, programmes for education and technical training in terms of rural areas and production, and support for distance learning for the Caribbean Coast. These actions are very important to guarantee the education of young professionals with an integrated vision of agroecology from the country's different territories. Similarly, in the arena of education and training the governmental plan aims to strengthen the Field Schools and Centres for Capacity Development and Adoption of Technologies.
98. (Q17) In terms of programmes and projects, the government is implementing programmes (i) to stimulate Sustainable Agricultural and Livestock Productivity and (ii) to research and innovate agricultural value chains (PRIICA). The first programme includes training in sustainable production technologies; training for business development and the establishment of associates; and on setting up seed banks.
99. (Q17) The MEFCCA has the mission to coordinate and policies, programmes and strategies, to build capacities for the development of the family, community, associative and cooperative economy, contributing to improve production and productivity of families. These key programmes are linked directly or indirectly with the agroecology model and they include: (i) support for climate change adaptation in coffee and cocoa production by small-scale producers in apt agro-climatic areas (4 January 2014 – 31 March 2020); (ii) development of the productive, agricultural, fishing and forestry systems in indigenous territories in the Caribbean Coast regions - RAAN and RAAS (2011 – FIDA ended in September 2016 and BCIE in March 2018.); (iii) support for the insertion of small-scale producers in value chains and access to markets (January 2008 – March 2016); and (iv) programme for the adaption of agriculture to climate change, through water harvesting (1 October 2014 – 31 December 2017).

- 100.(Q17) Two important initiatives aimed at improving access to credit and finance are: (i) Law N° 640, ‘Law for the creation of the Bank to Foment Production (Produzcamos)’, the objective of which is to promote production micros, small and medium-scale producers from the agricultural, livestock and industrial sectors; (ii) Law N° 717 ‘Law for the creation of the fund to buy land with gender equity for rural women’, the objective of which is to enhance gender equity in land ownership by enabling rural women to purchase land, granting legal and material appropriation of land to favour rural women.
- 101.(A1) It is not possible to address the new generation of young people through traditional activities, and hence it is important to develop innovative actions. In both the urban and rural areas the millennials, also known as ‘Generation Y’, who are people born between 1982 and 2004, represent an estimated 75 per cent of the population. For this reason it is important to invest in activities appropriate for this generation, involving information and communication technologies (ICTs) with a social focus, healthy eating and protection of the environment which represent the best way to young people’s interest in agroecology.
- 102.(A2) To retain young rural people in their communities of origin, the following policies are necessary: (i) the generation of employment and (ii) the creation of strong community organisations or institutions that contribute to the development of young people. As an example, in the municipality of San Dionisio, department of Matagalpa, the youth organisation that supports young people with credit to purchase land and develop productive projects, also promote cultural and recreational activities that make young people feel more involved in their communities⁸.
- 103.(A3) Based on the exchange held during the deliberative workshop held by the Farmers’ Jury, a series of key actions were defined to strengthen the participation of young people in promoting agroecology. These are: (i) training for young people about creating added value to agroecological products, (ii) promoting self-led cooperatives of young people; (iii) enabling the participation of young people in the Field Schools; (iv) granting family plots once they reach adulthood with a view to incentivising their participation in agroecology; (v) encouraging the participation of young people in decision-making spaces and communications media; (vi) pressuring for young people’s access to credit for agricultural production; (vii) supporting young people as entrepreneurs.

F) Awareness of the population about organic products, health and nutrition.

- 104.(INTRO) Determining to what extent Nicaraguans have changed their food customs continues to be a controversial topic, and it is even a challenge to understand the factors that

⁸Interview carried out with young rural people members of PCAC as part of the project.

influence their choices. According to the anthropologist Richard Wilk (2001) “the dialogue between different items of merchandise does not operate with common codes. The transmitter and receiver interpret the consumption of certain products in a totally different way, according to the attributes each gives to the product.” (Berth, 2014: 94). One example of this in Nicaragua was in 1980s when the FSLN government condemned the consumption of North American goods while consumers sought to acquire them. During the whole decade the government tried to convince its citizens through different propagandistic strategies to consume national products, but their efforts were in vain. At the beginning of the 1990s we can observe an important change in the buying habits of Nicaraguans. The rise of the supermarkets was accompanied by an advertising offensive, which triggered an increase in marketing agencies. This gave rise to a transformation in social representation around consumerism. This situation generated an interesting debate in Nicaraguan society about the role of publicity in the acquisition of goods and services. In this context, at the beginning of the 1990s, there was also a rise in North American fast foods, that quickly spread across the country at increasingly accessible prices, gradually displacing the consumption of traditional foods produced by small farmer families in the countryside (Berth, 2014).

105. ‘Nicaragua doesn’t have a good food culture, partly because it has been losing the customs of home-made food and replacing them with industrially prepared food ... Consumerism has brought us to disparage our own natural foods, inducing us to a fast-food culture, due to the fact that in our country Public Policy on nutritional education is non-existent, whereas the large multinationals invest large sums in dollars on publicity to change our habits of consumption’ (*Nosotras*, Weekly Supplement, 2005, in Berth 2014: 101).
- 106.(Q18) One group that displays passivity faced with the degradation of natural resources is young people. When they find the spaces for active social participation closed to them, along with traditional structures and hierarchies of power on community, municipal and national levels, they become frustrated and abandon their desires for citizen participation and renounce attempts to establish new projects or social initiatives. When they don’t encounter spaces for analysis and debate about their own particular problems: unemployment, education, housing and the environment, they tend to become inactive in social terms. Consequently it is important to promote youth leadership, the formation of young people’s spaces and give support for initiatives promoted by youth groups.
- 107.(Q18) Currently a state of indifference, passivity and a lack of interest can be perceived in our society with respect to the degradation of natural resources. In almost all cases we perceive citizens as spectators or in a state of indifference faced with environmental deprecation or in a state of negation of the facts; this apparent indifference is almost always accompanied by a low receptivity about the real context and a low level of information on all levels. It is a phenomenon that occurs in almost all types of society. Some factors that may influence this state of passivity include the scarce visibility of the facts, the difficult

access to justice, and some characteristics of the country's culture (excessive individualism, for example). The spread of social apathy increases the margin for manoeuvre by environmental predators and the confidentiality of the economic elites, except when the achievement of their goals causes a high level of social mobilisation.

108.(Q19) According to Azucena Zelaya, from SOYNICA, the current neoliberal economic system promotes the 'food' (synthetic and junk foods) offered by multinational companies through intense publicity campaigns and market strategies to the detriment of healthy and responsible eating.

109.(Q19) People who prefer to eat junk food rather than healthier alternatives do so because of: (i) the accessible price; (ii) their presence in educational centres at every level; (iii) greater distribution, (iv) constant availability; and (v) the process of globalisation and sedentary lifestyles that are among the factors influencing the patterns of consumption (El Comercio 2014); (vi) the ingredients in junk food change the hormonal flow thus encouraging the person to continue eating, even when they are satisfied; (vii) the high levels of sugar and salt added to this food and drink, inhibit the sensation of satisfaction in the body; (viii) wider publicity and offer; and (ix) its consumption becomes habitual.

110.(Q19) According to SOYNICA, the family nucleus is the key target group for actions for education and awareness about healthy eating habits, since the habits acquired in the home have a significant influence for the rest of people's lives. Because of the contact with the natural world and also because of their structure, rural schools show more openness to these campaigns, in spite of the existence of factors that influence negatively including: (i) advertising by industrial food and drink manufacturers, (ii) the lack of education and information from parents; and (iii) the families' limited buying power.

111.(Q20) Use of the millennial consumers' focus (also known as 'Generation Y'). People born between 1982 and 2004, on a global level and in Nicaragua, make up an estimated 75 per cent of the population and are part of the reality in both urban and rural areas. The 'millennials' are establishing new patterns of consumption and production for both the multinational and Nicaraguan enterprises. In terms of agroecology, one challenge related faced by millennials is to overcome the vision of the 'brands' associated with consumerism and also their openness to consuming other new products, especially those linked to the protection of the environment and to healthy eating. In this sense, the main entry point is the use of ICTs (Information and Communication Technologies).

112.(Q20) The millennials are demanding young people and have particular needs and aspirations, on which they spend approximately US\$600 billion a year. They have become the biggest generation of consumers and represent an important force for the global food and drinks industry. The economic situation is a key topic for many millennial consumers when

making decisions, since they are very aware of healthcare and as a result 51 per cent avoid fast food even when they have a very dynamic rhythm of life, while 63 per cent seek to improve their health through the food and drink they consume.

113.(A1) In valuing the development of food culture in Nicaragua and the priorities of the new generation consumers, it is essential to promote agroecological products focusing on the production of healthy foods that also contribute to the protection of the environment.

114.(A2) A national policy for healthy and agroecological food production and consumption should be promoted from local levels through municipal ordinances and on a national legislative level through legal reform. These actions could be covered within the framework of the 'Law for nutritional and food sovereignty and security', Law N°. 693, enacted on 18 June 2009 and published in Official Gazette N° 133 on 16 July 2009.

115.(A3) The legislative initiative described as 'the human right to adequate food and nutrition in schools' aims to support, participate and promote these rights and promote local buying, consumption, education and the development of agroecological food among children and adolescents. This will contribute progressively to modifying the social conditioning favouring junk food among the new generations.

116.(A4) Currently in Nicaragua a gradual and progressive tendency exists that is moving into a transition from the conventional farming model to the agroecological model, and also from the consumption model that prioritises junk food to one that promotes healthy foods. This is occurring both in society and within the State. This is an important opportunity to generate new public opinion around responsible consumption and Sustainable Production (SOYNICA, 2017).

117.(A5) In order to develop responsible consumption, in the first place healthy farming must be promoted through initiatives for the conservation of soils; indigenous organic production techniques; innovative methods for sowing that include bio-intensive, associative and agroforestry techniques to improve soils; and the promotion agroindustry and commercialisation. In this sense, the coordination with rural schools in promoting healthy eating is a very positive strategy that contributes to awareness at an early age through the implementation of school vegetable gardens where children learn in theory and practice.

118.(A6) According to SOYNICA, the alliances with local governments are very important. It is key to promote joint actions with the COMUSSAN (Municipal Commissions for Food and Nutritional Sovereignty and Security) created within the framework of Law N° 693 the 'Law for food and nutritional sovereignty and security' (enacted on 18 June 2009 and published in Official Gazette N° 133 on 16 July 2009). SOYNICA has had a positive experience with the COMUSSAN in Mozonte, Matagalpa, Estelí, Nueva Segovia, Madriz and Nandaime.

119.(A7) From the small farmers' perspective, the present government has not identified a defined role for them with respect to healthy consumption. For this reason they consider it important to organise a movement that contributes to promoting changes in the most efficient way in order to be more visible and listened to, in the elaboration and implementation of programmes, projects and Public Policy to do with agroecological production and healthy consumption. (Deliberative workshop, Farmers' Jury).

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APPENDICES

Appendix 1. Government Programmes.

Programme: Support for Adaptation to Climate Change for the Production of Coffee and Cocoa by small-scale producers in apt agro-climatic areas. (4 January 2014 to 31 March 2020).	
Objective of Programme:	Improve in a sustainable way the living conditions of rural families that are producers of coffee and cocoa, in the four geographical areas of intervention of the Programme, incorporating them into markets and reducing their vulnerability to climate change.
Funding:	Source of Funding: BCIE, FIDA (Loan and Donation). Total Amount of Funding: US\$37,051,532.00.
Institutions involved:	MEFCCA, INTA, IPSA, MAG, MIFIC, INETER and Secretary of the Caribbean Coast
Protagonists:	Accompany 40 thousand families with less than 20 <i>manzanas</i> who cultivate coffee and cocoa. The project covers 56 coffee and cocoa growing municipalities from Nueva Segovia, Madriz, Estelí, Jinotega, Matagalpa, Boaco, and 7 indigenous territories in the RACN and RACS.
Programme: Development of the productive, agricultural, fishery and forestry systems in indigenous territories of the RAAN and RAAS. (2011 – FIDA ends in September 2016 and BCIE in March 2018.)	
Objective of Programme:	Improve the levels of income for 10,580 families living in indigenous and afro descendants territories on the Caribbean Coast, selected for Programme intervention, supporting their production, the management and sustainable use of natural resources and strengthening their organisations.
Funding:	Source of Funding: BCIE, FIDA (Loan and Donation). Total Amount of Funding: US\$12,000,000.00.
Institutions involved:	MEFCCA, MAG, INTA, INAFOR, MARENA, INPESCA, Secretary of the Caribbean Coasts, Regional Governments, CONADETI. It is estimated that in the five years of programme duration the programme will directly and indirectly attend to 10,580 families indigenous and afro descendants people.

Programme: Support for the insertion of small-scale producers in value chains and access to markets. (January 2008 - March 2016).	
Objective of Programme:	Enable the target group to improve equitably their living conditions and increase their assets using natural resources in a sustainable way.
Funding:	Source of Funding: BCIE, FIDA (Loan and Donation). Total Amount of Funding: US\$28,321,542.19
Institutions involved:	MEFCCA, INTA, IPSA, INFOCCOP, MAG. At the closure of the programme 21,000 producer families became involved in value chains for coffee, honey, dairy, beans, rice, meat, fruit processing, and cocoa. Similarly, 18,000 homes improved their food security and 5,000 families are involved in alliances and business agreements for added value and access to markets. The project accompanied producers and producers in 27 municipalities in Boaco, Matagalpa, Jinotega, Nueva Segovia, Madriz, Estelí, León, Chinandega, Masaya, Granada, Carazo and Rivas, among others.
Programme: Adaptation of Agriculture to Climate Change, through water harvesting in Nicaragua. (1 October 2014 to 31 of December 2017)	
Objective of Programme:	The project aims to contribute to increasing resilience to the effects of climate change and variability for producer families with problems of access to water in Nicaragua's Dry Corridor.
Funding:	Source of Funding: COSUDE. Amount of Funding: US\$9,600,000.00.
Institutions involved:	MEFCCA, MAG and INTA. In the framework of this programme 1.500 families as protagonists will be accompanied in the departments of Madriz, Estelí, Nueva Segovia, Matagalpa, Boaco, Chontales, Jinotega, León, Granada, Rivas, Carazo, Masaya, Managua, in order to improve their food production, incorporating irrigation through the collection of water using agroecological technologies.