

## **Alternative Agriculture and Agroecology in Nicaragua**

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### **Introduction**

I am pleased to bring you greetings on behalf of the Environmental Movement of Nicaragua, the Nicaraguan working class, and those central American and Caribbean organizations affiliated with the International Federation of Organic Agriculture Movements (IFOAM/Latin America). I serve on the Coordinating Committee of IFOAM/Latin America together with Ms. Noris Bañez of Venezuela who is in charge of research, and Mr. Nelson Alvarez of Puerto Rico who is in charge of communication.

I am not going to make a technical presentation because I would merely be repeating the concepts and activities of the alternative agriculture movement throughout the Central American and Caribbean Regions. However, I would like to briefly discuss the Nicaraguan experience in the development of alternative agriculture and agroecology and how it relates to the agricultural, socioeconomic and environmental policies of the Nicaraguan government.

### **Natural Resources and Ecology**

Nicaragua is a small country located at the center of the Central American Isthmus and occupies about 130,000 square kilometers with some 3.5 million inhabitants. Lakes, lagoons and reservoirs occupy about 10,000 square kilometers of the total land area. The country is divided into three agroecological zones: (a) The Central Pacific Zone which has a tropical savanna climate; annual precipitation ranging from 700 to 1500 mm; and soils of great agricultural potential, (b) The Central Zone which has areas of tropical savanna and humid tropical forests where annual precipitation ranges from 700 to 2000 mm; it also comprises a zone of climatic transition which is related to steep mountains and highlands; soils having the greatest agricultural potential are mainly those in the valley bottoms, and (c) The Coastal Atlantic Zone which is comprised of tropical forests and has a very humid climate with annual precipitation ranging from 2500 to 6000 mm; because of the excessive rainfall, the soils are highly leached, acidic, and contain phytotoxic levels of aluminum; this zone is limited to forestry and a subsistence-type of agriculture.

All of our arable soils, regardless of their agroecological relationship, are fragile (often marginal) and subject to rapid degradation from erosion and desertification from intensive and exploitive cropping practices. For example, in the 1940's cotton production was actively promoted as an export crop which soon transformed our best agricultural areas into monoculture cotton. Modern technology including chemical fertilizers, pesticides, and machinery were introduced to achieve the highest possible yields. In due course, the lack of best management practices to maintain soil tilth, fertility and productivity resulted in extensive land degradation through soil erosion and loss of productivity. The situation was compounded in the 1950's with the advent of the Green Revolution and the exploitive farming practices associated with intensive production of cereal crops under irrigation.

The end result of these events has resulted in a dramatic change in land tenure and ownership. For example, in the Coastal Pacific Zone much of the land that was once owned by small farmers was confiscated through legal manipulation because of non-payment of debts. It was then sold to speculators and large farmers for the production of crops for export. Such ventures were highly profitable because they utilized cheap labor, often consisting of the small farmers who had been displaced from the land. Because of this, there has been a heavy migration of displaced farmers and farm laborers from the Coastal Pacific Zone to the Coastal Atlantic Zone, and also to the highlands of the Central Zone.

Consequently, much of the land that was considered to be totally unsuitable for agriculture, i.e., forests and steep mountainous areas, has now been devastated through degradative processes resulting from slash and burn, migratory agriculture. This has also led to an alarming rate of

deforestation in Nicaragua. For example, in the 1950's about 60 percent of the country was forested; however, by the early 1990's this figure had declined to less than 25 percent. The widespread soil erosion by wind and water, from such misuse of land, and the associated transport and deposition of agricultural chemicals and sediment, has caused monumental environmental problems of urgent national concern including (a) depletion and chemical contamination of potable water supplies for coastal cities, (b) impairment and contamination of regional hydrologic systems and networks, (c) destruction of estuaries and wetlands by sedimentation and chemical contamination, (d) decline in edible species of fish and shellfish in aquatic ecosystems from sedimentation and chemical contamination, and (e) increased incidence of problems relating to human health, e.g., respiratory and gastrointestinal difficulties.

### **The Political Situation**

During more than 10 years of the Sandinista Popular Revolution, a number of changes were made that directly affected agricultural policies and practices in Nicaragua. For example, the structure of land tenure was reformed; a large number of labor cooperatives were organized; agricultural loans and bank credit were easier to obtain; and subsidies were available to help farmers acquire costly agricultural chemicals, i.e., chemical fertilizers and pesticides. Meanwhile, agriculture continued to contribute to environmental pollution and degradation of the natural resource base, including the progressive deforestation of marginal lands by peasant farmers practicing slash and burn agriculture, i.e., shifting cultivation.

However, during the Sandinista/Contra War, the economic embargo imposed by the United States severely restricted technical assistance for agricultural and economic development. Small farmers and peasant farmers were particularly impacted by the lack of such assistance. Nevertheless, there has been considerable progress including the development of our organizational capacity, a sense of collective and commercial labor, a spirit of independence, and commitment to social equity and improvement.

The newly elected Government of Nicaragua, which succeeded the Sandinista Popular Front, has implemented neo-liberal policies of free enterprise and privatization that have encouraged the importation of technologies for large-scale production of export crops. These policies do not appear to be supportive of the non-governmental organizations (NGO'S) that have provided technical assistance on alternative agricultural technologies to small farmers in the past. In view of the fact that most of the food crops and food products marketed and consumed in Nicaragua are produced by small farmers, including peasants, there is a growing concern that the government has neglected this sector while providing a disproportionate amount of resources to support the large commercial farms. However, the policies of the Sandinista Agrarian Reform Program were generally supportive of small farmers and helped to resolve some of their problems and constraints.

Because of such inconsistency in government policies, the NGO's that advocate alternative agriculture and agroecology to improve productivity, profitability, stability and long-term sustainability of small farms must develop new and meaningful strategies to (a) influence governments and contribute to the socioeconomic progress of the country, (b) improve the quality of life of the most disadvantaged peasant farmer, and (c) protect, conserve and restore the ecological balance of the environment. NGO's must work toward sustainable rural development by promoting the principles of alternative agriculture and agroecology in Nicaragua and throughout Latin America

### **The Concept of Alternative Agriculture and Agroecology**

We consider alternative agriculture or agroecology as a holistic science which imitates the laws and principles of natural ecosystems and productive processes, with man as an integral part of the environment, indeed as a protagonist. This is why the farmer is so important, and why he/she should receive more attention from those who provide technical assistance and who are responsible for research and education programs on organic farming, nature/natural farming, alternative agriculture, agroecology, and low-input/sustainable agriculture.

All of these movements have similar goals including conserving energy and utilizing alternative energy sources; restoring and maintaining biodiversity of agroecosystems and the environment; utilizing on-farm (i.e., internal) resources; reducing the farmer's dependency on off-farm (i.e., external) inputs including fertilizers, pesticides, machinery and credit; utilizing appropriate technologies; controlling pests without chemicals; improving and maintaining soil fertility and soil productivity; and increasing the production of basic food crops.

The strategies for achieving these goals include recycling of organic wastes as biofertilizers and soil conditioners; using crop rotations and nitrogen fixing legumes; using green manures and cover crops to control soil erosion and nutrient run-off; using biological and integrated pest management practices to minimize the need for chemical pesticides; improving the integration of crops and livestock for increased production of both components; and perhaps most important of all, using skilled management to integrate the components into a holistic system.

### **Initiatives of the Alternative Agriculture and Agroecology Movement in Nicaragua**

While there have been some initiatives by NGO's, private research centers and university groups in Nicaragua to develop more comprehensive programs on alternative agriculture, results so far have been somewhat limited. The Environmental Movement of Nicaragua (MAN) completed a study in 1991 which indicated that there were 35 different organizations involved in the development of alternative agricultural technologies. Among these are the following:

#### **The National Union of Farmers and Livestock Breeders (UNAG)**

This group has conducted experiments to determine the best management practices for integrating crops and livestock production on steeply sloping lands. Specific practices include conserving soil, water and nutrients, controlling soil erosion, and reducing the farmers dependency on fertilizers and pesticides.

#### **The Center for Biological Agriculture**

This center is also known as the Farm of New Hope and was founded by the Antonio Baldiviezo Center of the Catholic Church. It has conducted experiments to improve crop rotations and production in the humid tropics including agroforestry systems, silvi-pastoral systems, agro-horticulture systems, and farm gardens with emphasis on minimal use of agrichemicals.

#### **The Environmental Movement of Nicaragua (MAN)**

As part of their agricultural and environmental development program, MAN conducts experiments to improve the yield and quality of organically-grown coffee and promotes the use of alternative agriculture technologies to improve farm production in general. The Environmental Movement of Nicaragua is represented on the coordinating committee of IFOAM/Latin America and coordinates the sub-region of IFOAM/Central America and the Caribbean. This involvement has helped us to develop meaningful and effective programs for improving the socioeconomic conditions of small farmers and of extremely poor peasant farmers. The Nicaraguan experience in promoting the use of alternative agriculture practices and principles is quite similar to that of other countries in the region. All of these initiatives, without exception, attempt to combine the indigenous knowledge and established practices of the traditional agriculture with skilled management, to achieve the most productive, profitable, and sustainable system.

### **Problems and Constrains that Limit the Widespread Adoption of Alternative Agriculture**

There are a number of problems and constraints that limit the adoption of alternative agriculture in Nicaragua including the following:

#### **Commitment to the Use of Imported Agricultural Technologies**

The Agroexport Development Model adopted by our government obligates our farmers to use costly technologies that are imported from more advanced agricultural production systems in developed countries. Often, the cost of these technologies may exceed the farmers net returns per unit of land. Thus, government policies make it difficult for farmers to adopt alternative agricultural practices and more appropriate technologies even though they would be less harmful to the environment,

food quality, and human health.

### **Lack of Validated and Proven Technologies to Demonstrate and Implement With Farmers**

Appropriate technology packages to assist small farmers in converting from traditional agriculture to more productive, profitable, stable and sustainable systems have often not been adequately tested and demonstrated. In the case of larger farms we need to develop appropriate management and technology packages to replace the high external input approach of the Green Revolution, and this has not been done. In addition to testing and demonstrating the cost/effectiveness and cost/benefit relationships of these technologies, they must be presented in a format that is easily understood at the local level.

### **Lack of Available Loans and Credit for Small Farmers**

Banks are often reluctant to loan money and extend credit to small farmers since they are perceived to be of greater risk than large commercial, export-oriented farmers. Banks are even more hesitant to loan money to farmers who seek to reduce their dependence on chemical fertilizers and pesticides. In making loans to farmers, banks often stipulate in the loan agreement that the farmer must agree to use agrichemicals in his crop production program.

### **Unfair Conditions in the International Marketplace for Organically-Grown Products**

Farmers are often at an unfair disadvantage when marketing organically-grown foods and commodities for export. Farmers may accept a buyer's offer for a particular product only to learn later that the resale value of the product in the country of import has increased by 100 percent or more. The buyer may claim that such a markup is necessary to cover the cost of organic certification. The best solution here to ensure fair market prices for such products is for the government to standardize and regulate organic certification procedures in the country of origin, and let the market price be based on the law of supply and demand.

### **The Future Agenda of IFOAM/Latin America**

The member organizations of IFOAM/Latin America are seeking to establish a regional network throughout Latin America to exchange the results of research, education, and training programs on alternative agriculture and agroecology, and the ultimate effect of transferring technology to the farmer's level. We need to standardize our methodologies and approaches, and conduct similar studies in countries throughout the region to produce databases that can enhance scientific and socioeconomic development. Moreover, many of the solutions to problems and constraints that limit the acceptance and adoption of alternative agriculture technologies can often be dealt with more effectively through a regional network for Latin and South America, similar to the Asia-Pacific Natural Agriculture Network (APNAN).