

## **Organic Farming in Sri Lanka**

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### **Abstract**

The agricultural production system in Sri Lanka consists of two traditional and well-defined components. One is the plantation section, established during the colonial period, consisting of large units, and producing perennial crops such as coffee, tea, rubber, and coconut mainly for export. The other is the smallholder sector comprised of small farms which produce most of the country's rice, vegetables, legumes, tubers, spices, and fruits. Fertilizers and pesticides have long been used for the production of plantation crops in Sri Lanka. Until several decades ago, most of the smallholder operations were farmed with little or no input of agricultural chemicals. Today, with emphasis on greater production to meet increased food demands, the use of chemical fertilizers and pesticides is increasing throughout the smallholder sector: There is also growing interest and demand for producing organically-grown food products for export. Some production units have already experienced considerable success in such ventures. Organic food production and marketing could be greatly expanded in Sri Lanka. However, research is needed to develop organic farming systems and practices that are efficient, productive, and profitable.

### **Introduction**

The Democratic Socialist Republic of Sri Lanka, situated off the southeastern coast of the Indian subcontinent, is an island of 65,614 km<sup>2</sup>. The geographic location of the country has a major impact on its tropical climate, which is influenced by two monsoons. These monsoons bring abundant rainfall from the northeast and southwest during the months of October to January and April to July, respectively (Domros, 1974).

Due to the availability of rainfall, the presence of a warm, humid tropical climate and rich soil, the country has traditionally been involved in agriculture. Even in the ancient past, Sri Lanka was often referred to as the *Granary of the East*.

The ancient agricultural systems of the country were primarily geared for the production of food for its people, using high levels of technology at that time. These were mainly sited in the north, central, and eastern regions of the island. This region, receives an average annual rainfall of about 1100 mm and only from the northeast monsoon. It has a pronounced dry period during the southeast monsoon, and is designated as the dry zone. Today, a complex man-made irrigation system comprises most of the dry zone. At one time this part of the country was self-sufficient in its staple food (rice) production and in most other food commodities, all of which were produced with traditional farming methods and without the use of agricultural chemicals.

During these early times, the central, western, and southern regions of the country produced food crops, but also established perennial cropping systems for production of spice crops. The production of spice crops was confined to this region because of the heavy annual rainfall (2200mm) coming from both monsoons. These agricultural systems in the so-called wet zone also produced crops with traditional methods, without using purchased chemical fertilizers. Spice production was responsible for the arrival of traders and, subsequently, the colonial powers from the west.

The productivity of the agricultural sector in the ancient past was primarily based on the use of locally available organic manure and other substances. Ancient literature, preserved in religious institutions, cite the use of organic compounds obtained from leaves, bark, seeds, and roots of trees such as *Azadirachta indica* (neem). Thus, organic farming could be considered as a primary determinant of a once successful agriculture in ancient Sri Lanka.

### **The Agricultural Situation**

After colonization of the country in 1815 by the British, cultivation of coffee, tea, rubber, and coconut emerged as principal agricultural export crops. Consequently, land for food production was

lost to these perennial plantation crops. This occurred primarily in the wet zone, because of the availability of suitable land and climate for the perennial crops. Thus, the agricultural sector was divided into two principal components namely, the plantation sector consisting mainly of well-managed, large units of perennial crops, and the peasant food crop sector. The latter generally consists of smallholdings throughout the country, although at one time they were more predominant in the drier regions of Sri Lanka.

### **The Plantation Sector**

The plantation sector established during the colonial period was well-managed for optimal production of export commodities. Since products were exported from the site of production, the nutrients and resources were thus removed from the ecosystem (Cox and Atkins, 1979). These systems became import-dependent and their productivity was based on the application of inorganic fertilizers and other chemicals to maintain soil productivity. A high input of chemicals became a principal requirement of these units, a practice that has been maintained to the present time.

Most of the units producing these perennial plantation crops also use chemical fertilizers to maintain a high level of productivity, which accounts for their success. Hence, the principal agricultural commodities for export and local consumption are generally produced by the use of agricultural chemicals. Currently, because of the demands for increased production of these commodities, increased competition from other countries, and declining commodity prices, the input of agricultural chemicals in the plantation sector is increasing.

The exception to such increased use of agricultural chemicals in this sector is the traditional smallholder spice gardens in the mid-country of Sri Lanka. The intensive cropping of perennial spices in a randomly mixed way has enabled these farmers to establish productive and stable agricultural production systems with minimal input of fertilizers and pesticides. Studies by Jacobs and Alles (1986) and Sangakhara (1989) have described many beneficial characteristics of these ecosystems, including the low input of inorganic chemicals. Thus, in the plantation sector these units can be considered as the principal enterprises that tend toward organic farming. However, with increased demand for spices these units are now beginning to use chemical fertilizers, although pesticide use is generally uncommon.

### **The Smallholder Sector**

The food producing sector of Sri Lanka is characterized by smallholder units, scattered throughout the country. These units produce rice, vegetables, legumes, tubers, spices, and fruits. Due to our increasing population, increased cost of imported food, and diminishing resources for food production, especially land, greater production is the goal of the smallholder sector. The export of produce from these agricultural ecosystems makes them deficient in resources, especially plant nutrients needed to maintain their ecological stability, productivity, and sustainability. Most annual food production units grow two crops per year in seasons determined by the monsoons. These are dependent on chemical fertilizers to replenish plant nutrients that are lost through marketing and export.

The rice producing sector of Sri Lanka is greatly dependent on chemical fertilizers, especially nitrogen and potassium. Most farmers use nitrogen because of proven visible benefits of this nutrient. Increased use of chemical fertilizers and pesticides is also based on the use of improved high yielding varieties that are responsive to these inputs. The government extension programs promote the use of chemical fertilizers to increase yields and to achieve self-sufficiency. Hence, chemical inputs are a vital component of the rice-producing sector of Sri Lanka.

Agricultural chemicals are also an important production input for food crop units in the highlands of Sri Lanka. Again, this is attributed to the demand for greater quantities of food for an expanding population, rather than improved product quality. For example, the vegetable sector of the highlands uses very high inputs of chemical fertilizers and pesticides. Farmers of the drier regions also apply fertilizers, especially nitrogen, to obtain higher yields. This practice has become more and more

common due to increased demand for food and the urgency to produce higher yields and to achieve economic viability.

The development of intensive production systems using agricultural chemicals is promoted by extension programs which demonstrate the benefits of chemical usage to farmers. The fertilizer and agrichemical companies also encourage the use of their products through impressive advertising and promotional campaigns that attract farmer participation. They also fund research programs that encourage greater use of their products. Moreover, international funding agencies tend to support research projects that use agrichemicals. Thus, chemical-based agriculture is rapidly becoming commonplace in the food producing sector of Sri Lanka.

Among all food commodities, the fruit and home garden sectors are using very low agricultural chemical inputs. Most fruit farmers do not use pesticides although fertilizer use is increasing. The home gardens which produce vegetables and fruits for domestic consumption are not generally fertilized with chemical fertilizers.

### **The Organic Farming Sector**

Much of the agricultural sector of Sri Lanka has become dependent on agricultural chemicals. Fertilizers, pesticides, and growth regulators are widely used because of the increasing demand for food quantity, rather than quality, from a limited land area. Recently, however, interested individuals have developed organic farming units. These have been established from accumulated knowledge on the benefits of organic farming, and because of increasing demand for export of organically-grown products. These units which are scattered in the wet zone are considered negligible in the agricultural sector, since productivity is somewhat less than the traditional farming units which use agricultural chemicals.

Exports of organically-grown agricultural products to the western world are increasing. Vegetables, fruits, and spices grown without fertilizers and pesticides bring premium prices, thereby enhancing the economic viability of these production units. Nevertheless, the lack of research and extension programs on organic farming is the principal constraint to the development of productive and profitable organic farming in Sri Lanka.

### **The Future of Organic Farming**

It is unlikely that organic agriculture will play a very significant role in meeting the food production requirements of development programs in Sri Lanka. This is because of the ever increasing demand for greater quantities of food, and expressed doubts that strictly organic methods of agriculture can meet this demand.

Nevertheless, the concept of exporting quality foods grown under hygienic conditions without the use of agrichemicals, especially pesticides, and at premium prices, has attracted attention. Some production units have already been established with considerable success, and there appears to be an opportunity for their expansion to meet export demand. These units could also be developed under the self-employment schemes pursued by the state to solve unemployment problems. Export production villages could easily be established to cater to the demand for organically-grown products. Thus, the future of organic farming is promising in Sri Lanka primarily as an export or specialized commodity enterprise, rather than a general agricultural program.

A major constraint to the expansion of organic agriculture is the lack of research on the viability and sustainability of organic farming under local conditions. Research on organic farming has been centered around the use of some by-products such as straw (Amarasiri and Weerasinghe, 1977) as substitutes for imported inorganic fertilizers for rice and other highland crops. A few isolated studies have reported the use of *Azadirachta indica* (neem) as a pesticide.

Thus far, little research has been done on the development of process technology for producing organic manures and devising strategies for their rational use in Sri Lanka. This is primarily due to the emphasis placed on increased production by traditional means and the unavailability of funds for organic agriculture. Some microbiological studies on organic matter decomposition are currently

in progress.

The primary use of organic farming methods is seen in home gardening and some smallholder farming operations. However, with sufficient emphasis on research at the initial stages, followed by a well-developed extension program, government awareness can be directed toward organic agriculture. This can become a productive and profitable venture for Sri Lanka, especially as a specialized export-oriented enterprise that will generate much needed foreign exchange for the country.

### **Summary and Conclusions**

The agricultural sector of Sri Lanka is the primary source of livelihood of its people. This sector is dependent on the monsoonal rains which provide the primary determinant of successful agriculture. Thus, based on annual rainfall, the country is divided into three principal agroclimatic zones, i.e., the wet, intermediate, and dry zones.

The agricultural enterprises of Sri Lanka have traditionally been divided into two principal components, a perennial plantation crop sector and a peasant smallholder food-producing sector. Moreover, the traditional perennial spice crop units are found as smallholdings in the mid-country wet zone. The peasant sector can be categorized into lowland rice and highland food, vegetable, and cash crop production units. This sector is well-established and in the ancient past produced most of the food requirement using low levels of technology.

Because of our increasing population and expanding industrial development, the demand for agricultural commodities in recent years has greatly exceeded production. Thus, intensive agricultural production units were developed with the use of modern technology, especially the use of fertilizers and other agricultural chemicals. This trend is common to all systems because of the demand for greater quantity, rather than improved quality, of agricultural products.

The status of organic farming in Sri Lanka can be considered as marginal, due to the heavy demand for increased production of agricultural commodities. While organic fertilizers and associated products played a major role in rural agriculture in the past, these are not widely used at present. The exception to this is the mid-country spice gardens, where there is little or no use of chemical fertilizers and pesticides. The natural recycling of organic litter and crop residues maintains their soil productivity. In addition, a few smallholder allotments may not use agrichemicals primarily due to lack of funds for purchase of such inputs.

Recently, there has been an increasing demand for organically-grown agricultural commodities in the developed world. This has led to the establishment of selected units generally by interested individuals and nongovernmental organizations. These units produce export commodities for specific markets. Several principal buyers in the western world have provided incentives for establishment of organic farming enterprises. The scope of organic farming in Sri Lanka could readily be expanded to meet the demand for export-oriented products. This could help to resolve unemployment problems that afflict the country, and to generate much needed foreign exchange. Research is needed to develop productive, profitable, and sustainable organic farming systems.

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