

**PROMOTING ORGANIC FARMING IN SRI LANKA:
RELEVANCE, BENEFITS, AND CHALLENGES**

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G.P.Paranamana and H.K. Sarath

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Abstract

Recently, the concept of organic agriculture has sparked renewed interest worldwide. Agriculture plays a key role in Sri Lankan society, particularly in rural areas. No significant research has been carried out on the role of organic agricultural practices. Most studies in the field of organic farming have concentrated only on the disadvantages of non-organic farming. This study set out to examine the relevance, benefits, and challenges of moving to organic farming practices as a substitution for inorganic farming in Sri Lanka. This research consists existing literature review to identify the relevance and benefit of organic farming practices. Assessment questionnaires on the challenges posed by the transition to organic farming practices were collected from 60 farmers involved in paddy farming in the Hambantota district. Results showed an excessive usage of agrochemicals and fertilizer in the Sri Lankan agriculture sector when compared to the peer countries. Regional countries such as India and China are moving towards a global market by focusing on organic farming. Consumer demand for organic foods is rising in the West. Using literature survey analysis this study shows that Sri Lanka has a great opportunity to enter the global market through organic food production. When compared to the South Asian region, Sri Lanka used a higher level of fertilizer in agricultural activities. Although the government implements the organic concept into the farmland there are many challenges from the field. Most of the farmers did not participate in the induction programs. In contrast, they strongly believe the government should intervene in the market to succeed in this policy. Responsible institutions should identify the necessities of the farming community and organize and conduct training programs according to farmers' requirements. The government can access this program by giving the farmers the support they expect from the government.

keywords: Benefits, challenges, farmers, organic farming

INTRODUCTION

Organic farming is an important concept for developing countries to achieve the Millennium Development Goals (MDGs) targeted for 2015. It highlighted the need for a sustainable agriculture methodology to eradicate hunger (zero hunger) and promote food security under the second-millennium development objective. Accordingly, the organic farming methodology is important to achieve those goals. (Setboonsarng and Markandya, 2015)

Since the 1970s, governments in developing countries have taken actions to expand organic farming with the aim of economic growth, food security, and reducing environmental risk. (Herath, 2021) In contrast, focusing on the Sri Lankan context, Sri Lanka has historical experience in organic farming. Traditional Sri Lankan farmers who practised agriculture used “Kem methods¹(International Union for Conservation of Natural and Natural Resources- IUCN,2016)”, to control the pests. The Government of Sri Lanka has taken a policy decision in 2021 to restrict the use of chemical fertilizers and to encourage organic fertilizers under the theme of 'A Green Country, A Poison Free Tomorrow'.

The focus on organic farming cannot be described as a single concept. It can be described as a combination of all the components of economics, ecology and health. Accordingly, it is important to pay close attention to the experiences and lessons of other countries in the world regarding organic farming. As argued by Qiao et al., (2016) turning to organic produce is very important for small-scale farmers in developing countries. It has been further pointed out that they can get high yields through improved seed, better technology assistance, and using organic fertilizers.

Organic agriculture is a concept that is devolving all over the world as an alternative concept to the non-organic farming method. According to many researchers (Narayan, 2005; Perera et al., 2007), non-organic agriculture which is currently in use, is harmful to human health and environmental conditions. Within this situation, there is a tendency for the world community to turn to organic farming. While developed countries initially identified with the negative impact of inorganic farming, the trend seems to be gradually spreading to other parts of the world (Narayan, 2005). Therefore, the transition to organic farming can be seen as a rising trend in the world. Also, the growing demand for organic food items among consumers has been a positive factor in the expansion of organic farming. According to the World of Organic Agriculture Statistics, 2020 the area under organic farming is increasing rapidly. The largest area of organic farmland is Oceania, which covers an area of

¹ Our ancestors used traditional beliefs instead of used pesticides for the pest in the past. Such as astrological practices, spirits and gods beliefs, chanting pirith, lighting of fire torches. In detail, astrological practices – Usually a Sunday is chosen to initiate work relating to paddy cultivation. The work is beginning on an auspicious day and at an auspicious time. Farmers follow the astrological calendar to avoid bad luck.

Spirits and gods – Farmers visit the temple and make an offering before they start cultivating. Pirith verses are used to charm sand and water. Then sprinkle over the field. Manthara-Charmed pebbles and sands buried in each corner of the field to protect the harvest.

about 36 million hectares and is about half the area of organic farmland in the world. Europe is the second-largest organic region in the world. It covers about 15.6 million hectares of the world's organic farmlands. Latin America, Asia, North America, and Africa cover 8, 6.5, 5, and 3.3 million hectares respectively. Australia is one of the leading countries in the field of organic farming and Argentina and China followed by 2nd and 3rd places in the world (Helga et al., 2020)

China is the main organic food producer in Asia. China is the third-largest organic producer in the world. China mainly exports beans, rice, and tea to the world market. Bhutan has been expanding organic farming since 2004 intending to turn to 100% organic farming by the year 2020. However, they were not able to achieve those goals by 2020. (Feuerbacher, et al, 2018) India also supplies about 30% of the world's organic food to the world market. Organic cotton export is the main organic export from India (Hans and Rao 2018). Regionally, there is a high demand for organic coconut oil and organic teas in Sri Lanka from Germany, Italy, France, the United States, Canada, Australia, Singapore, Japan, and Spain. (Silva, 2020)

Organic agriculture can be identified as one of the fastest-growing sectors in terms of global and regional conditions. The Government of Sri Lanka is currently in the initial stages of promoting organic farming. Hence this is a timely important study to examine why Sri Lanka moved to the organic farming concept and its benefits and challenges. Therefore, this study aims to examine the relevance, benefits, and challenges regarding this.

MATERIALS AND METHODS

Both qualitative and quantitative techniques have been used in this study. A systematic literature review was constructed of this study that identifies the relevance and benefits of promoting organic farming in Sri Lanka. Collecting primary data is one of the more practical ways to identify problems. The design of the questionnaire was based on paddy farmers in the Hambantota district. According to the paddy statistics (2019-2020), the Hambantota district reported the highest average yield per acre when compared to the other districts. Hambantota districts consist of 12 Divisional Secretariats (DS) areas. Out of them randomly selected Beliatta DS division. Beliatta DS divisions consist of 71 Grama Niladhari (GN) divisions. Again, two GS divisions were randomly selected and were Palapotha West and East. The population in these two GN divisions was 1493. Among them, 72 cultivators cultivated only paddy. The rest of them are cultivated mixed crops. Hence 60 samples were selected for this study using Krejcie and Morgen's (1970) table. Krejcie and Morgen's table was constructed using the below formula.

$$S = \frac{[X^2NP (1-P)]}{[d^2 (N-1) + X^2P (1-P)]}$$

N= Population size

P= Population proportion

d= Degree of accuracy expressed as a proportion

S= Sample size

In the analysis section, a few statistical methods were used namely chi-square analysis and related important index methods. Farmer's responses (market, government intervention, training programs) were measured by using a five-point Likert Scale. Scale statement were weight like; strongly agree (n_5)=5; agree (n_4)=4; neither agree nor disagree (n_3)=3; disagree (n_2)=2; strongly disagree (n_1)=1. The relative important index was estimated by using the following equation.

$$\text{Relative important index} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{A * N}$$

A = Highest weight (5)

N= Total number of respondents (60)

LITERATURE REVIEW

Relevance of an Organic Farming Technique in Sri Lanka

The agriculture sector plays an important role in the Sri Lankan economy. According to the Central Bank report (2020), the contribution of the agriculture sector is a 6.0 percent contribution to the gross domestic product. In addition to that, Athukorala et al., (2017) pointed out that one-third of the total workforce is directly and indirectly employed in the agricultural sector in the rural area. So, the impact of agriculture on the living standards of the rural population is at a noticeably higher level. Therefore, agriculture is very helpful in uplifting the living standards of rural people and eradicating rural poverty.

In contrast, the government of Sri Lanka introduced various policies and programs to the encroachment of the agricultural sector. One of them is providing fertilizer as a subsidy for agricultural activities. So, the government spends a large portion of the GDP on the fertilizer subsidy. Hence, the profitability of the production of agriculture is gradually declining due to the high cost of importing chemical fertilizers (Agricultural Survey Report, 2019)

The import of chemical fertilizers in Sri Lanka is 1,260,053 metric tons, which costs more than US \$ 56 annually (Average). Further, paddy production required 383,000 MT for other crops need 877,053.5 Mt per year from 2015 to 2020. Considering the year 2020, the import of fertilizer was 57, 4705.5 MT and the expenditure of foreign exchange exceeded 36 billion rupees. (Ministry of Agriculture, 2020) Therefore, turning to organic fertilizers would be a great solution to Sri Lanka's foreign exchange crisis. It also has the potential to reduce government spending.

Figure 01 illustrates fertilizer usage of South Asian countries, it is clear that the usage of chemical fertilizers in Sri Lanka is at a high level compared to peer countries from 1961 – 2018.

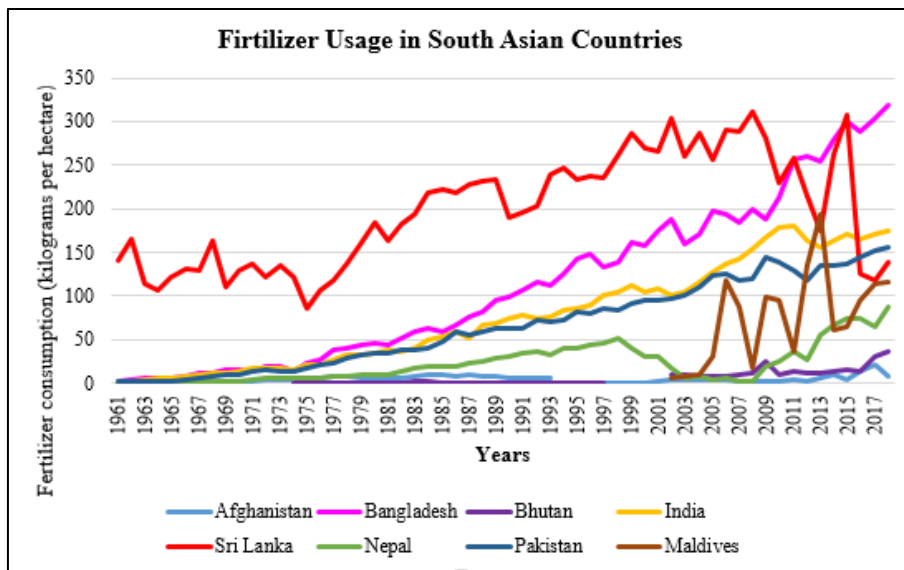


Figure 01: Fertilizer Usage in South Asian Countries

Source- Developed by the author based on World Bank data 1961-2018

In the Sri Lankan context, the usage of agrochemicals is almost high in every field of agriculture. Vegetable cultivations in up-country in Sri Lanka are intensive and highly commercialized because income derived from vegetable production is higher when compared to other cultivations (Wijewardhana, 2001). Wijewardhana and Amarasiri, 1993, have reported that the usage of fertilizers in upcountry vegetable cultivation was higher than the recommended rates.

Inorganic fertilizers not only increase the cost of production but also affect the environmental quality (Ariyapala and Nissanka., 2006). Other than that soil and drinking water quality of the wells also had been affected by the intensive vegetable cultivations in up-country Sri Lanka (Kuruppuarchchi, 2010; Wijewardhana, 2001). However, indiscriminate use of inorganic fertilizers is being continued in these cropping systems throughout the year with the least consideration on soil quality, partly due to the low cost of subsidized chemical fertilizer. Studies on fertilizer usage in intensively cultivated vegetable soils have been conducted during the period when the material subsidy on chemical fertilizers was in place (Weerahewa et al., 2010). In addition, Kendaragama (2006) studied the fertilizer usage in different cropping systems in Sri Lanka when the “Kethata Aruna” fertilizer material subsidy programs were in place and reported that chemical fertilizer usage for vegetables in upcountry vegetable cropping systems varied from 100 to 425% of the recommended level. This research further pointed out that, higher usage of chemical fertilizer in the long term, will affect the physical, chemical, and biological structure of the soil.

Gnachandran and Sivayoganathan (1989) point out that the acute poisonings of pesticides are the main cause of death in Sri Lanka. Accordingly, Anuradhapura, Polonnaruwa, and Hambantota districts can be listed in that order. All these areas are

with an agricultural background. Gnachandran and Sivayoganathan further show that farmers do not have much understanding of the use of the chemical. Most of the time farmers clean their pesticide spray equipment in common water bodies.

Importation of chemical fertilizers has become costly, excessive use of chemical fertilizers on crops, and due to the increasing environmental damage caused by the use of chemicals by farmers without proper understanding, it is of paramount importance to focus on eco-friendly organic farming. Organic food promotion in Sri Lanka as well as around the world boasts that organic food is more nutritious than non-organic food and improves human health. However, an experimental comparison of organically grown and conventionally grown foods shows that the quality of the food does not affect the product mass. (Woese et al., 1997)

Benefits of Organic farming

Environmental Benefit

When comparing organic farming and inorganic farming, many researchers have shown that the use of organic fertilizers is more environmentally friendly than the use of chemical fertilizers. (Gattinger, 2012; Tuomisto et al., 2012, Lynch, 2012)

Siegrist, et al., (1998) found that earthworm biomass and density and population diversity were significantly higher than the organic farming system when compared to conventional farming. Also, Gerhardt (1997) found that greater earthworm abundance is active on organic farmland. Further, Selim et al., (1970) Welp and Brummer, 1999; Taiwo and Oso, 1997) demonstrated that the usage of pesticides negatively affects the growth of microorganisms in the soil. Because of a higher level of chemical application and less level of absorbing chemical pesticide movement of water source, due to rainfall after application. In addition to that, Stolze et al., (2000) argue that organic farmers use an environmentally friendly pest control method, hence the risk to the population from that material is very small. Unwin, et al., 1995 also found that there are no examples of water contamination have been reported in organic farmlands.

However, Wood et al., (2006) reminded that compared to the organic and organic farming method, organic farming uses direct energy, energy-related emissions, and higher emissions of greenhouse gasses. Therefore, there is air pollution regarding organic farming.

According to the literature, there are positive and negative sides to using organic fertilizer. Hence, when promoting organic farming practices should consider both aspects regarding this.

Economics Benefit

Sri Lanka is currently facing a foreign exchange crisis. By 1950, Sri Lanka's foreign reserves were sufficient for 11.6 months of imports, and by 2020, only 6.4 months of imports were sufficient. (Central Bank Report, 2020) Therefore, there is a high

demand in the world. Export of organic produce can solve this foreign exchange crisis.

According to the World Agriculture Organization, the largest market for organic food is the USA by 2020. Followed by Germany and France, respectively. As a single market, the United States accounted for about 42% share of the global organic food market. The report also shows that the European Union imports 3.3 million tons per annual of agricultural food. It contains especially fruits, nuts, and spices. According to the world market situation, Sri Lanka has great potential for exporting organic foods. Also, chemical fertilizers and chemical pesticides were not used for organic farming, so it will help to reduce the cost of production. Therefore, the government will be able to reduce the cost of importing chemical fertilizers and pesticides. Jansky et al., (2003) point out that organic farming is cheaper than non-organic farming when compared to both farming systems in the Czech Republic.

According to many researchers, the labour required for organic farming is higher than for non-organic farming. (Narayan, 2005, Qiao et al., 2016: Santhikumari and Narmilan, 2019) Santhikumari and Narmilan, 2019 noted that female farmers are more likely to engage in organic farming activities in the Northern Province of Sri Lanka. The study further shows that the contribution of women to agriculture is high. Because women do not have to leave their lives to find a job. They can earn income to supply their labour for agricultural activities. The organic farming system is more labour-intensive. Athkoralala et al., (2017) found that eighty percent of the total workforce is directly or indirectly employed in the agricultural sector and the agricultural sector plays an important role in the food supply chain and food security of Sri Lanka. Hence it will help to reduce the rural unemployment rate and maintain food security at the country level.

Challenges of promoting organic fertilizer

This section based on primary data were collected from the field survey which covers 60 farmers who are engaged in paddy farming. The purpose of the field survey is to identify challenges related to organic farming.

Descriptive statistics of the Sample

Most respondents were male (67%). Nearly, 57% of respondents were educated up to G.C.E (A/L). And 90% of respondents have more than 10 years of experience in farming. About 57% of respondents were medium-scale farmers (This study categorized farmland as follows: less than 1 acre - small scale farmers; 1-5 acre-medium scale; greater than 5- large scale). All the farmers were engaged in paddy cultivation.

According to the data collected by the farmers who are engaged in the agriculture sector, the following challenges are observed in the field.

Lack of Quality Standards Organic fertilizer

According to the analysis data obtained from the field, 75% of the farmers are owners of large-scale and medium-scale farmland. About 25% of the smallholder farmers have taken steps to produce the organic fertilizer they need in their fields. However, large-scale cultivators were not able to produce the required amount of organic manure and they could be seen buying from the market. Although farmers bought organic fertilizers from the market, they were not so satisfied with the quality of the fertilizers and the ingredients they contained.

Market Conditions

When considering market conditions, attention should be paid to the local market as well as global markets. Here the farmer response to the Likert scale is first presented in association with a cross-tabulation table. Accordingly, a chi-square test was performed and the hypothesis was established as follows.

H₀: There is no association between the local market and the foreign market.

H₁: There is an association between the local market and the foreign market.

Table 01: Crosstabulation Results

			Foreign markets for organic products are available		Total
			Agree	Disagree	
Local markets for organic products are available	Strong agree	Count	15	0	15
		Expected Count	14.3	8	15.0
	Agree	Count	9	0	9
		Expected Count	8.5	4	9.0
	Neither agree or disagree	Count	30	0	30
		Expected Count	28.5	1.5	30.0
	Disagree	Count	3	3	6
		Expected Count	5.7	3	6.0
Total		Count	57	3	60
		Expected Count	57.0	3.0	60.0

Source – Developed by the author based on field survey, 2021

H₀: There is no association between the local market and the foreign market

H₁: There is an association between the local market and the foreign market.

Table 02: Chi-square analysis

	Value	Degree of freedom (df)	Asymptotic Significance (2 Side)
Pearson Chi-Square	28.421	3	.000
Likelihood Ratio	15.504	3	.0001
Linear- by – Linear Association	7.874	1	.005
Number of Valid Cases	60		

Source – Developed by the author based on a field survey, 2021.

Table 2 shows the results of the hypothetical test. Accordingly, the hypothetical test received a chi-square value is 0.0000. This probability value is less than 0.05. Hence, we can conclude that H_0 was rejected and H_1 was accepted. This means there is an association between these two markets.

Table 03: Relative important index related to the market conditions.

Statements	Relative important index
Foreign markets for organic products are available	0.78
Local markets for organic products are available	0.71

Source – Developed by the author based on a field survey, 2021.

When the Relative importance index lists the attitudes of individuals, they have a more favourable attitude towards the foreign market than the opportunities available in the domestic market.

Government intervention

Table 4 shows the response of farmers to the need for successful intervention to make organic farming a reality and to make it a success. Accordingly, many farmers view that government intervention was needed to maintain a profitable and stable market price for farmers' products. The farmers respond that government intervention is needed to maintain the counselling services and training of the farmers. Thirdly, the farmers pointed out that the government should ensure that there is a proper supply of organic manure for cultivation without any shortage. The farmers responded that a subsidy scheme should be implemented to compensate the farmers for their loss or damage of harvest.

Table 04: Relative important index related to the government intervention

Statement	Relative important index
Maintain considerable market price	0.91
Providing necessary training programmes	0.88
Providing required fertilizer without any shortage	0.85
Provide subsidies to manage risk	0.76

Source – Developed by the author based on field survey, 2021

Participating training program

Training programs are conducted by the government and responsible institutes to familiarize the farming community with organic farming. When inquiring about the participation of farmers in these programs, it was seen that about 37 percent of them actively contribute to the program and 63 percent of them do not participate in the programs.



Figure 2: Participation in Training Programmes

Source – Developed by the author based on a field survey, 2021.

Table 05 illustrates that, farmers' participation in the organic farming awareness program. It can be seen that farmers' participation is considerably lower level. Moreover, when farmers engage in agricultural activities, they don't have time to participate training programmes in outside of the farmland.

Table 05: Reasons for non-participating program

Responses	Relative important index
Low literacy level	0.87
Because of travel long distance to training center	0.80
Neglecting farm activities due to attending training programme	0.75
Inadequate training programme	0.72

Source – Developed by the author based on field survey, 2021

When analyzing the reasons why farmers did not participate in training programs, it is shown that their literacy level is low and it could be identified as the main reason they did not participate in training programs. The second most important reason is that the farmers have to travel long distances to reach the training centres. So they do not have adequate transport facilities. Also, the third most important reason is that the farmers thought that they had lost their time engaging in cultivation activities when participating in training programs farmers think that the training is impractical and unsuitable because they have to face many problems in applying the training knowledge in the field as a practical manner.

CONCLUSION

This study aims to examine the relevance, benefits, and challenges of promoting organic agriculture in Sri Lanka. It analyzes the relevance and benefits of access to organic agriculture in Sri Lanka through local and foreign literature. According to the literature survey analysis, organic agriculture is important from the perspective of health, environment, and economy. Further organic food demand is increasing in the global context. Hence Sri Lanka has a vast range of potential regarding organic food production.

However, many challenges could be identified from the field survey in the Hambanthota district. It was clear that in terms of market conditions, farmers are more weight on foreign markets than domestic markets. Therefore, if their harvest does not reach the local market, there may be a shortage of rice in the local market. Also, the farmers are expected to directly intervene in the government to promote organic farming. In addition, they are seeking the support of the government to maintain considerable market pricing, and training programs, and develop access to fertilizers without shortage, and risk management. Therefore, the government should take steps to maintain fair price levels for the farmers in the market. Also, there should be a proper mechanism for the distribution of fertilizers as required. Also, an alternative mechanism should be needed to manage farmers' risks and assess and compensate for their crop damage.

Farmers' involvement in training programs which were organized by the government, shows a tendency. Due to the non-attendance of farmers in awareness programs and

training programs, they lose the ability to acquire the required knowledge. It is more effective to conduct such training programs practically. The officers who have organized the programs should allocate their time flexibly. If they planned the programs, discussed them with farmers, and arranged a suitable time for them. The government and relevant institutions should take steps to go to the farmers' fields meet them and share the necessary knowledge and training with them.

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