

## **Farmer perception on organic fertilizer usage: A case study of Beliaththa DSD**

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### **ABSTRACT**

The agriculture sector plays a vital role in the food supply mechanism in Sri Lanka. There is an increasing interest in organic agriculture practices in the global context, due to the supply of healthy food and less harm to the environment. Concerning the large body of positive impacts of organic agriculture, Sri Lanka is also trying to move towards organic farming practices. Within this context, this study aims to assess farmers' perceptions of organic fertilizer usage. This study is based on the Beliatta divisional secretariat division, Hambantota district of Southern Province. The sample size is 120 paddy farmers and all of them are selected by using a simple random sampling technique. A descriptive research method was used to analyze the data. This study used different aspects to examine farmer perception of organic fertilizer usage. The study results show that majority of the farmers use organic fertilizer due to environmentally friendly, healthy, and low production cost. At the same time, the majority of the farmers are not agreed about the production volume and appearance of the product. Further, farmers have doubts about market opportunities for organic products. Moreover, large-scale farmers are less likely to move into organic fertilizer next five years. In contrast, small-scale farmers are very likely to use organic fertilizer on their farmland. In addition to that, according to survey details, majority of respondents responded that the mixed method is more practical than zero usage of chemical fertilizer at the initial stage.

**KEYWORDS:** Farmers perception, Organic fertilizer, Chemical fertilizer

### **Introduction**

Organic farming can be defined as an alternative farming concept which does use biological and ecological materials instead of chemical inputs in the production process (Gafs et al., 2010). Ancient peoples use the organic method for their farming activities. However, farmers tend to use chemical fertilizers and pesticides for their agricultural activities as a result of the industrial revolution (Perera et al., 2007). Therefore, agricultural yield significantly increases with agricultural products that have got a better appearance. Hence, farmers tend to use chemical fertilizer and pesticides to maximize their yield and get the quality of their agricultural products. Nowadays, there has been an increasing tendency to demand organic products among consumers globally. To fulfill excess demand, organic production and organic farmlands are rapidly increasing.

When considering the distribution of organic farmland at the regional level, the Oceania region comprises approximately half of the total organic farmland area by 2020 (Table 1). Table 1: In 2020, organic farms and 74.9 million hectares worldwide. Further total organic farmland increased by 4.1 percent when compared to 2019 (Helga et al., 2022).

**Table 1: Organic Agricultural Land by Region - 2020**

Region	Percentage share
Africa	2.8%
Asia	8.2%
Europe	22.8%
Latin America	13.3%
North America	5.0%
Oceania	47.9%

*Source : Helga et al. (2022)*

However, many researchers claim that organic agriculture was more crucial for the reduction of poverty and organic agriculture provides a positive relationship between organic agriculture, poverty reduction, and food security in developing countries (IFAD, 2003; Araya and Edwards, 2005; Egziabher, 2005). In the Sri Lankan context, the agriculture sector occupies an important role in the economy despite its significantly low contribution to the gross domestic product and relatively low growth rate. In addition to that, it provides direct and indirect job opportunities for the rural population in Sri Lanka which is nearly 80 percent (Weerehewa et al., 2010). According to the report of the Food and Agriculture Organization (FAO), organic agriculture contributes to preserving countries' food security and it is an important strategy not only for trade but also it satisfied family food necessities for local consumers. Moreover, United Nations Environment Programme (UNEP) has mentioned that the organic agriculture concept is an economically and environmentally sustainable production process in the world when compared to other farming techniques (UNEP, 2011). Recently, there has been renewed interest in the usage of organic fertilizer. Within this context, the study aims to identify the perception of organic fertilizer usage among farmers.

## Research Problem

Fertilizer is one of the necessary inputs in agriculture. Therefore, any policy which is related to the fertilizer policy directly impacts agricultural productivity. The government of Sri Lanka has supported the farmer community in the country providing subsidies for fertilizer at incredible costs since 1962. The objective of this fertilizer subsidy is to improve both production and productivity. So, the government spends a large portion of the GDP on fertilizer subsidies. Hence, the profitability of the production of agriculture is gradually declining due to the high cost of importing chemical fertilizers (Data collection survey, agriculture sector, 2019). According to the recent data in government (Ministry of Agriculture, 2020) import of chemical fertilizers in Sri Lanka is 1,260,053 metric tons, which costs more than the US \$ 56 annually (Average). Further, paddy production required 383,000 MT for other crops need 877,053.5 Mt per year.

Considering the year 2020, the import of fertilizer was 57, 4705.5 MT and the expenditure of foreign exchange exceeded 36 billion rupees.

In the Sri Lankan context, the usage of agrochemicals is almost high in every field of agriculture. For example, Wijewardhana and Amarasiri (1993) pointed out that, vegetable farmers in upcountry use higher fertilizer than recommended rates because of higher income derived from upcountry farmers by cultivating vegetables when compared to the other crops.

Non-organic fertilizers increase the cost of production and also affect the quality of the environment (Ariyapala and Nissanka., 2006). In addition to that, well water quality also had been affected due to excess usage of chemical fertilizer in up country in Sri Lanka (Kuruppuarachchi, 2010; Wijewardena, 2001). Weerahewa et al. (2010) found that chemical fertilizer usage is increased due to giving material subsidies of chemical fertilizer by the government. In addition, Kendaragama (2006) studied fertilizer usage in different cropping systems in Sri Lanka. They found that chemical fertilizer usage for vegetable in upcountry is 425 percent over the recommended level. This research further pointed out that, higher usage of chemical fertilizer in long term, will affect the physical, chemical, and biological structure of the soil.

Within this context, the governments try to promote organic fertilizers instead of non-organic Fertilizers. Similarly, the Sri Lankan government has also introduced Haritha Lanka Programme (HLP) as a national plan to green the Sri Lankan society. Recently, the government of Sri Lanka restricted the import of non-organic fertilizer and agrochemicals with effect from the 6th of May 2022. The aim of this project is to improve Sri Lankan people's health and promote organic agriculture with organic fertilizer (Beillard, 2021). The Government introduced this organic cultivation program under the theme of “ Haritha Ratak, Wasa Wisu Nathi Hetak” in 2021, There is much dialogue among policymakers, government officials, farmers, media, and the general public towards both positive and negative arguments about the new program. Therefore, it is timely to review the farmer's perception of organic fertilizer usage on their farm land.

## **Literature Review**

Organic farming is considered to have lower input usage and lower yield and higher output prices compared to non-organic farming systems. The organic farming system requires greater natural pest control methods. Further, Cacek and Langner (1986) outlined that, the organic farming system is less detrimental to the environment and human health. However, organic farming needs a greater level of organizational skills from a management perspective. Nguyen et al. (2008) emphasized that crop rotation is an important technique of organic farming systems. It is the advantage of the reduction of CO<sub>2</sub> emission, production efficiency, and maintaining yield at a sustainable level in the long term.

According to MacRae et al. (2007), organic yields, on average, are 10 percent less than the yield of conventional farming. Hence, more countries are intensive in conventional farming. In contrast, when compared to the profit level, the difference can be 20 between organic and non-organic farming.

Cavigelli et al. (2009) pointed out that, when compared to the non-organic and organic cultivation systems, organic agriculture systems have recorded low costs of production and low yields. Also, organic systems reached greater net returns by 2.4 times with a lower level of risk.

Qiao et al. (2016) done a comparison of organic and conventional tea farms in Wuyuan, China, and Kandy, Sri Lanka. They found that organic production and non-organic tea production performed better economically in Kandy Sri Lanka. But, in Wuyuan, organic tea estates provided a considerably low profit while the conventional tea farm was unprofitable. However, organic households performed slightly better performance in Wuhan. Qiao et al. (2016) emphasized that organic production is more gainful for farmers who are farming in small-scale developing countries. Qiao et al. (2016) pointed out that, small-scale farmers reached higher profits through better seeds, organic fertilizer, and technical assistance. However, they have to take the risk. Acs et al. (2009) found that organic yields fluctuate more than conventional yields.

A transition from conventional to organic farming is a collection of many actions. As seen in previous studies, the transition can take 1–3 years. It will depend on the product and government regulations. Mamo and Bayih (2019) conducted a study to assess farmers' perceptions and attitudes on compost and chemical fertilizers in South Ethiopia. The study found that farmers have given less attention to the usage of compost. In contrast, they have a greater tendency to use chemical fertilizers. Further, the study identifies determinates of less usage of compost, such as Lack of knowledge, labor force requirement, and lack of training.

Further, Balamurugan and Karthikesan (2018) conclude that most farmers have a positive opinion about applying natural manures in India. In contrast, most large-scale farmers are not ready to use organic manures due to lack of natural manure, slower released nutrition, need for a large quantity of manure, difficulty to prepare and store, low output for the beginning period, natural calamities, government policy for producing organic products. Ghosh et al. (2020) found that 80 percent of respondents had a positive attitude towards organic farming in Bangladesh. Also, their main information sources regarding organic farming were relatives and extension agents.

## **Methodology**

This study analyzes the farmers' perception of using organic fertilizer in the Hambantota district. This research is based on primary data collected from 120 paddy farmers in Beliatta divisional secretariat division, Hambantota district, Southern Province, Sri Lanka. The structured questionnaire was developed to collect data from field surveys. Data analysis was taken from SPSS statistics software.

As an analyzing technique, relative important indexes were used to identify farmers' perceptions on different aspects such as environmental, healthy, production, cost, and marketing. Farmers' perception was measured by using a five-point Likert Scale. Scale statements were weighted like; strongly agree (n5) :5; agree (n4):4; neither agree nor disagree (n3):3; disagree (n4):2, strongly disagree(n1):1 Relative important index was estimated by using the following equation.

$$\text{Relative Important Index} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{A * N} \quad [1]$$

## Results and Discussion

The majority of the farmers were responded that they strangely agreed that organic fertilizer essential in the farmland to improve the quality of soil and water. Also, respondents have a greater positive attitude towards using an organic fertilizer than chemical fertilizer which is favorable for the environment. Further, farmers believe that organic foods are healthier than non-organic food. And also farmers believe that organic fertilizer usage has fewer side effects for farmers, too. In the farmers' perception of production capacity, the majority of the respondents believe that production volume will decline when using organic materials. Considering the production cost aspects, farmers' opined that organic fertilizer is less rather than chemical fertilizer.

In the farmer's perception of the marketing aspect, it is clearly indicated that the majority of the farmers responded that they are less satisfied with the market availability of organic foods. Further, they mentioned that poor awareness of consumers about the value of organic products and lack of government support are major challenges in finding market opportunities. Hence, it reports least value of the relative importance index. Thus the farmers feel that applying organic manure is a high environmental benefit, favorable for health, and low-cost concept. Further, the value of the index is low production capacity and appearance of the chemical-free product. In addition to that, farmers have doubts about market opportunities for their production. Hence relative importance index value is less compared to the other aspects (Table 2).

**Table 2: Relative Important Index**

Aspects	Index
Environmental aspects	0.98
Health aspects	0.82
Production aspects (Volume and appearance)	0.66
Cost aspects (Cost of production)	0.85
Marketing aspects (Availability of market opportunity)	0.57

*Source :Authors' calculations based on field survey, 2021*

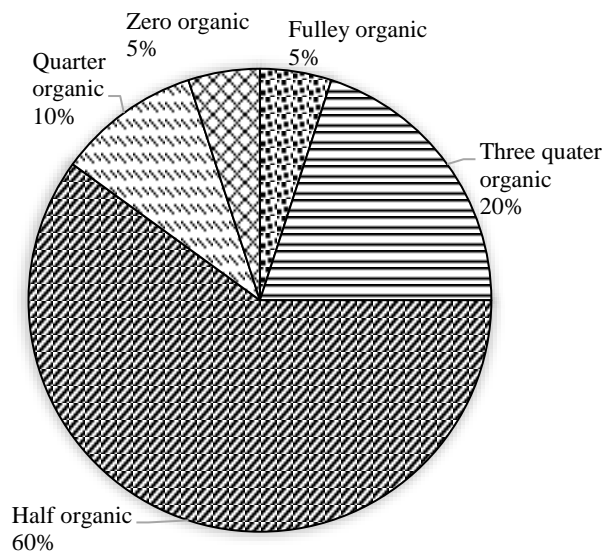
According to the results of cross-tabulation, small-scale farmers are very likely to use organic fertilizer (Table 3). Also, the majority of medium-scale farmers and large-scale farmers are less likely to move into organic fertilizer.

**Table 3: Results of the Cross-tabulation**

Land Size	How likely to move organic fertilizer within the next five years			
	Very likely	Less likely	Undecided	Total
Less than 1 Acer	20%	-	-	20%
Between 1-5 Acer	10%	35%	5%	50%
Greater than 5 Acer	-	20%	10%	30%
<b>Total</b>	40%	45%	15%	100%

Source : Authors' calculations based on field survey, 2021

According to the farmers' perception regarding the usage of organic fertilizer, the majority of the farmers are likely to use both organic and chemical fertilizer on their farmlands at the initial stage (Figure 1). It is because farmers need a sufficient period of time to adapt to the new policy. Also, farmers believe fully organic farmland is not practical at the initial stage. Hence, farmers are willing to move into the use of organic fertilizer step by step.



**Figure 1: Opinion about Organic Fertilizer Usage in the Initial Stage**

Source : Authors' calculations based on field survey, 2021

## Conclusions

The majority of farmers have positive perception usage of organic fertilizer on their farm land. When analyzing farmers' perceptions in different aspects farmers are more likely to move toward the organic due to it being farming concept, environmentally friendly. Also, health and low material costs are relatively important aspects secondly and thirdly. However considering the volume of the product and appearance of the product its relative importance is much weaker. Finally, farmers have much doubt regarding the market opportunities. Hence, market aspects accounted for the least value.

On the other hand, medium and large-scale farmers are less likely to move on to organic patterns within the next five years. It will be a challenge for food security in the country. So, the government needs to take necessary action for that. Farmers are more likely to use mixed fertilizer (Organic and chemical) at the initial stage. Therefore, government needs to intervene in giving subsidies to promote organic fertilizer usage among farmers.

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