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Yield vs. cost: Difference between organic and inorganic farming in Sri Lanka

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It is not the yield but the costs that farmers are concerned about when making a decision on chemical-based or organic farming

By Chatura Rodrigo (http://static.ft.lk/ftadmin/wp-content/uploads/2016/04/21214355/DFT-13-9.jpg)



Chemical-based paddy farming is geared towards achieving higher yields with new improved rice varieties and new farming techniques. Therefore, the popular argument against the adoption of organic paddy farming is that it does not generate enough yields and that might constrain the supply of rice for Sri Lankans.

However, a majority of organic farmers defend their efforts

guaranteeing same yields as chemical-based paddy farmers. (Organic farming also provides additional benefits, mainly Ecosystem Goods and Services). If there is no difference in the yield, the question arises as to why farmers are not adopting organic farming. Perhaps, it may be the case that it is not about the yield that farmers are concerned, but about the cost that they incur in the production process.

The research

In order to understand this situation further, the Institute of Policy Studies of Sri Lanka (IPS) initiated a research project covering more than 600 paddy farmers in the Galle, Matara, Kandy, Matale, Gampaha and Colombo districts. The research was funded by the South Asian Network for Development and Environment Economics (SANDEE).

The research adopts a mixed method approach and aims to provide policy insights to better understand the opportunity costs associated with paddy farming in Sri Lanka. This article is based on some initial findings of the farmer survey and will be a starting point of further analysis.

Are the findings compatible with popular beliefs?

There were 310 organic farmers in the survey sample and the maximum yield for organic paddy farming was recorded at 2730 kg/acre. Inorganic farmer sample also consisted of 310 farmers and the maximum yield from inorganic farming was recorded at 2625 kg/acre. The average yield from organic farming was 1393.7 kg/acre and the average yield from inorganic farming was 1313.7 kg/acre.

On statistical grounds, it was proven that there is no statistical significance between the two yield components. Therefore, on average both organic and inorganic farmers were producing the same level of yield. The findings were against the popular belief where inorganic farming was expected to have higher average yields.

However, further information suggests that a majority of organic farmers are cultivating varieties that are proven to be high yielding. In addition, they have adopted cultivation methods claimed to be associated with astronomy and auspicious times. Whether these practices are significantly affecting the yield or not is yet to be proven. It is also a subject beyond the scope of this research. However, it is clear that organic farmers are using varieties that are high yielding and their farming practices are complementing the high yields.

The average seed paddy requirement in organic farming (41.4kg/acre) is lower than inorganic farming

(44kg/acre). Focus Group Discussions (FGDs) proved this information where farmers confirmed the seed paddy requirement is low for organic paddy farming. However, in statistical terms, there is no significant difference in seed paddy requirement in organic and inorganic farming.

As the article suggested at the start, the difference could be in the cost components of the two cultivation methods. However, all cost components might not have a statistical significant difference. One major cost component is the cost of seed paddy. Results from the survey suggest that the average cost for seed paddy in organic farming is Rs. 4,420 per acre and in inorganic it is Rs. 4,346 per acre. During FGDs organic farmers also pointed out that they are accounting a higher cost for seed paddy compared to inorganic farming. However, cost of seed paddy did not differ significantly among organic and inorganic farmers.

In the standard classification of organic paddy farming and inorganic paddy farming, the organic paddy farmers are not expected to use any form of chemical fertiliser such as MOP, TSP and UREA. However, inorganic farmers can use organic fertiliser and still call themselves inorganic farmers. The study suggests that some organic farmers (close to 20% of the sample) use chemical fertilisers as well. However, the amount they use is less than the amount used by inorganic farmers. These differences are statistically different as well. The comparison below is based on the sample of inorganic farmers and self-proclaimed organic farmers who use chemical fertilisers.

Average MOP usage in organic farming (22.4 kg/acre) is lower than the usage in inorganic farming (36.8 kg/acre). Also the average TSP usage in organic farming (21.1 kg/acre) is lower than the usage in inorganic farming (27.6 kg/acre). Furthermore, Average UREA usage in organic farming (58.17 kg/acre) is lower than the usage in inorganic farming (98.45 kg/acre).

Animal manure, leafy manure and bone manure are the main organic fertiliser types that are in use. The percentage of inorganic farmers that use the above mentioned organic fertiliser types are less than 5%. Therefore, it does not make sense to compare. However, organic farmers use 120.2 kg/acre of animal manure, 28 kg/acre of leafy manure and 35 kg/acre of bone manure. Furthermore, on average 539.6 kg/acre of bio-pesticides are being used by the organic farmers in their cultivations.

Another major cost component is the cost of labour. Labour is two-fold, family labour and hired labour. In terms of family labour, average values are Rs. 13,935.5 per acre and Rs. 17,789.7 per acre for organic farming and inorganic farming, respectively. This suggests that the inorganic farming tend to employ much family labour. This difference in terms of family labour is statistically significant as well. In terms of hired labour, the average values are Rs. 11,936 per acre and Rs. 14,585 per acre for organic farming and inorganic farming, respectively. This analysis shows that there's a clear statistical difference in cost of labour between organic and inorganic farming -- organic farming employ less family as well as hired labour compared to inorganic farming.

Results from the FGDs support this finding as they confirmed that most of the "shared labour methods" are still in effect among organic farmers, which reduces labour costs. In terms of the cost of machinery, an organic farmer on average spends around Rs. 22,300 per acre and an inorganic farmer

on average spends around Rs. 13,852 per acre. These results were further justified during the FGDs where organic farmers mentioned that conventional machinery are not easy to use with organic paddy farming mainly due to the morphology of the plants (height and the width of the plant bunch).

Results show that organic farmers are getting a higher farm gate price compared to inorganic farmers. The average output price from organic farming is Rs. 47.98 per kg while inorganic farming it is Rs. 38.72 per kg. These prices are statistically different from each other. This suggests that organic farmers are better off in terms of output price.

Current status

It is important to understand the full structure of the profits to determine which farming method is more profitable than the other. The estimation of the input demand functions will allow in estimating the opportunity cost of supply associated with organic farming compared to inorganic farming. This is the next step of this study.

However, this preliminary analysis provides some valuable insights. First of all, it is important to remember that the data collection was done in year 2015 where the fertiliser subsidy was in full effect. The chemical fertilisers were subsidised 90% which is a considerable cost saving component for inorganic farmers. In addition to paying for organic fertiliser or employing labour in preparation, the FGDs suggest that organic farmers had to incur many transaction costs such as transportation, in securing required organic fertiliser.

Secondly, most organic farmers were not commercial oriented compared to inorganic farmers, meaning that they sold less of what they produce. Therefore, even though they were offered a higher price at the market place, finding a market was not an easy task. FGDs confirmed that the opportunity cost of finding a market place for organic farmers is higher compared to inorganic farmers. This increases the unintended transaction costs such as storage and transportation.

Thirdly, cost of machinery for organic farmers is quite high compared to inorganic farmers. For example, as suggested by the FGDs, some organic paddy lands are muddy. Therefore, the average time a tractor spends on ploughing the land is higher thus increasing the cost of land preparation.

These insights justify the starting point of this article, that it is not about the yield, but it is about the costs that the farmers are concerned when making the decision.

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