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Causes of farmers' aversion to organic vegetable production in Shyamnagar and Kaligonj Upazilla of Bangladesh

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A B S T R A C T

Agriculture is an ongoing changing field where farmers constantly change production technology by adopting different updated modern practices. The study explores the motivating factors influencing farmers to switch to synthetic pesticides dependent on farming from organic farming methods. The main factors are the lower price of organic vegetables, pesticide availability, social responsibility and economic considerations. The most challenging AEZ -13 coastal Satkhira has been taken for this study. The result shows that farmers who choose to switch give high importance to the production cost, price of organic vegetables, supply of bio-product, and availability of organic products than the moral, economic and social concerns.

Keywords: Bio-product, Chemical inputs, Organic manure, Lure, Color trap

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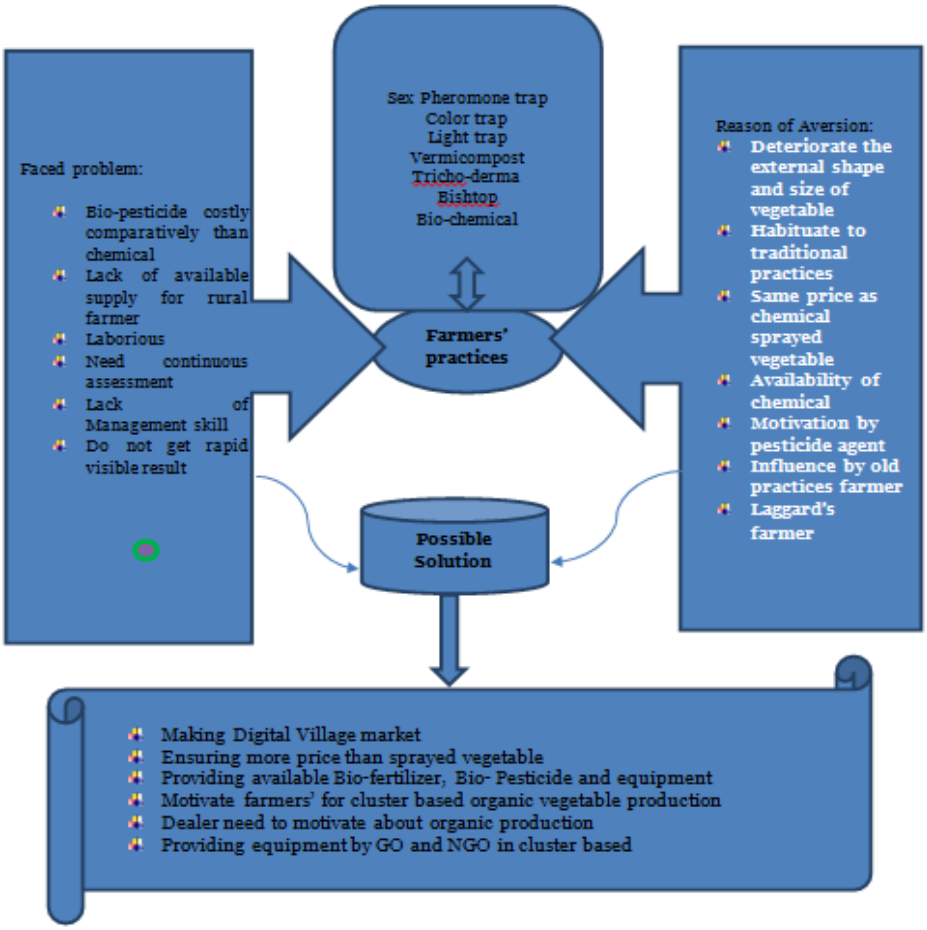
Introduction

Agriculture has been a way of life for people for a long time. Traditional farming systems that considered the earth a living being moved the way for modern agriculture. The outcome of new technology transfer is the farmers, adoption and bringing this into practice and further diffusion to other individuals in the community. Regarding adoption, farmers sometimes discover problems in putting recommendations into practice. Adopting, adjusting or rejecting depends on farmers' behavior (Valera and Plopino, 1987). The switching was mainly because of the increased demand for food, which forced people to adopt modern techniques like high-yielding variety seeds, use of fertilizer etc. Seven studies show that adopting organic farming is subject to social concerns and economic reasons (Mzoughi, 2011). Organic farming offers solutions for problems associated with conventional agriculture, such as environmental problems, biodiversity loss, food safety, and animal welfare (Haring *et al.*, 2004). Consumers prefer organically produced food products rather than products produced using synthetic chemicals. The benefits of consuming organic food products are healthy, nutritional value, animal welfare and environmental protection (Paul and Rana, 2012; Doorn and Verhoef, 2015). Belief in high quality, better tastes, and health consciousness are the primary drivers behind purchasing organic food products (Paul and Rana, 2012; Doorn and Verhoef, 2015). This changing purchase pattern of consumers influenced the marketing of organically produced fruits and vegetables. Agriculture is a field that has undergone constant and rapid change. These changes are often attributed to newer farming techniques, technology's impact, and the way farmers view farming. Frequently changes in society's outlook also influence farmers to adopt new and improved farming methods which are suitable. (Pautasso *et al.*, 2016) Bangladesh ranked 3rd in producing vegetables globally (Hossain, 2019). It not only meets up its demand but also import to other countries. Bangladesh government is trying to achieve food sustainability and food safety. Agricultural departments are providing training and educational materials for farmers. For this reason, they focused on organic vegetable production. Recently some farmers have been averse to adopting technology for organic vegetable production. Farmers have been seen as a significant constraint in the development process (Cruz, 1987). Several factors influence the

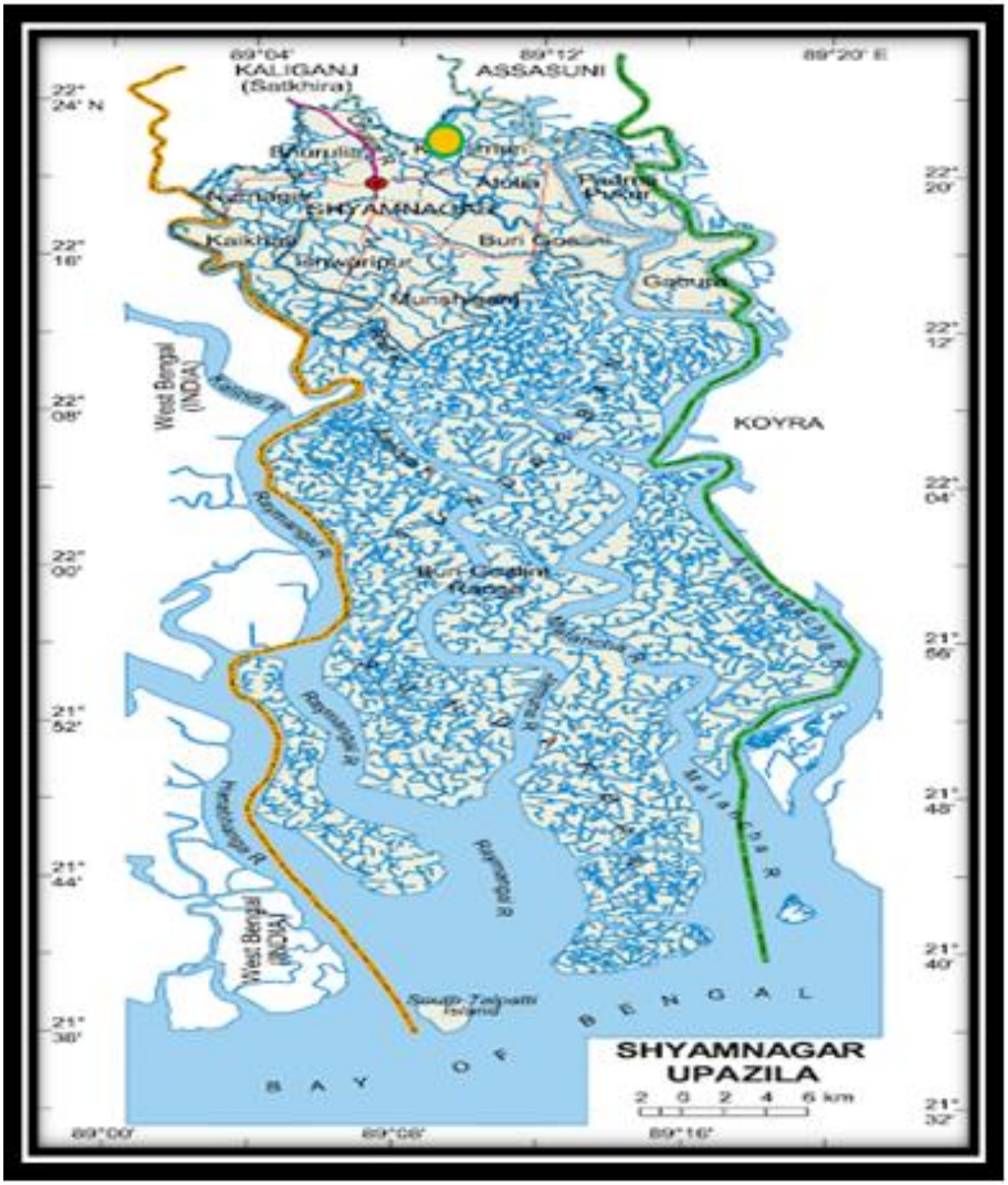
extent of adoption of technology, such as characteristics or attributes of technology; the adopters or clientele, which is the object of change; the change agent (extension worker, professional, etc.); and the socio-economic, biological, and physical environment in which the technology take place (Cruz, 1987). Agriculture depends on the uncontrolled use of fertilizers and other chemicals are causing severe effects on the public and environment (Pimentel *et al*., 2005). The usage of chemical inputs on agricultural land is reducing soil fertility, and in succeeding crop seasons, farmers are forced to use more chemicals to get the same yield as received before. Farmers use chemical inputs since they are getting high yields. However, the negative impacts are equally important to be considered. Continuous use of chemical inputs has caused damage to the environment and human health and caused problems to the environment and agricultural sustainability (Pimental *et al*., 2005). Modern Agricultural practices are paving the way for sustainable agriculture. The extensive use of chemicals for crop production has polluted the agricultural land. These highest uses of pesticides and chemicals are causing environmental damage and serious effects on the producer and consumers' health. This study was conducted in the Shyamnagar and Kaligonj Upazila of Satkhira district to investigate the reason behind switching from organic to inorganic agricultural practices of farmers. The identification will help suggest and spread the organic vegetable production practice.

Conceptual Framework



Methodology

Focus group discussions mentioned by ASA (2023) were used to collect the qualitative data. Group discussion was conducted with knowledgeable farmers who practiced organic vegetable production and were averse to the technology at Kashimari Union of Shyamnagar Upazila in Satkhira. Collected data was taken from 46 farmers who practiced organic vegetables in their fields. The discussion was conducted to draw upon the information on how farmer views technology, their experience, belief, and adoption of technology. The additional contact with individual farmers for complimenting information was also conducted. For result analysis, Microsoft Excel software was used in this study.



Results

The informants for the study cultivated different crops and are practitioners of mixed cropping also. The major crops in cultivation included Eggplant, Tomato, Cauliflower, Cabbage, Lady's finger, Bottle guard, Pumpkin, Broccoli vegetables and fruits. Analysis of the farmer's motivation-based landholding is given in Table 1. Classification based on landholding size: 'Small farm' was up to 0.2 hectare, and 'large farm' was above 0.21 hectare.

Table 1. Distribution of farmers according to their adequate farm size.

Categories according to land possession (hectare)	Practiced farmer (n=46)		Percentage
	Male	Female	
Small (up to 0.2)	27	7	73.9
Large (above 0.21)	8	4	26.1
Total	35	11	100

It was found that the majority of the farmers had a small farm size of 73.9 percent and the rest 26.1 percent large.

Farmers' definition of organic vegetable production

Organic food is the food produced by methods complying with the standards of organic farming. It features practices that cycle resources, promote ecological balance and conserve biodiversity. Organizations regulating organic products may restrict certain pesticides and fertilizers in the farming methods used to produce such products. Organic foods typically are not processed using irradiation, industrial solvents or synthetic food additives. The farmer thinks for production, they can use natural products besides synthetic products in fewer doses and maintain a long interval. From farmers' interviews, it is indicated that farmers practiced some specific technology such as sex pheromone trap, colour trap, vermicomposting, light trap, Trichoderma, bishtop and bio-chemical. Table 2 shows the percentages of aversion.

Table 2. Percentage of averting from a specific technology.

Name of technology	Previous user Number	Now practicing Number	Percentage of Aversion
Sex pheromone trap	46	28	39.1
Colour trap	46	16	65.2
Vermi-compost	46	36	21.7
Light trap	5	0	100.0
Trichoderma	32	5	89.1
Bishtop	8	0	100.0
Bio-chemical	31	12	73.9

*Among 46 farmers, 12 females (26.02 percent) were directly involved in agricultural production. Farmers are mostly 100 percent opposed to the Light trap and Bishtop of the lack of available electricity and visible result. Farmer know the advantages of Trichoderma but do not get available supplies. For this reason, 89.1 percent of farmers are opposed here. On the other hand, Bio-chemical is costly and less effective compared to synthetic chemicals. This 73.9 percent of farmers chose the synthetic chemical. Synthetic fertilizer retailers also indirectly push them to take insecticides. Farmers know and try to practice Sex pheromones and colour traps but need more management skills and cost to avoid this technology.

Farmers' perception of technology

Farmers believe that technologies suit farmers because they give good efficiency in high yield, less pest, and more benefit. Technology is important in agricultural production. Organic farming is also eco-friendly.

Farmers' learning of technology, training, adoption and diffusion

Farmers were not trained in most of the technologies related to organic agricultural production. Farmers were introduced to the technology of crop production and fish production. Farmers' practices learn from cosmopolitanism and oral communication outside the formal training.

Faced problems in field practice

Costly comparatively than synthetic chemical

Local pesticide sellers are the consultant for poor rural farmers. So, the seller suggests those synthetic chemicals where he can earn more commission. But, organic tools and equipment have a fixed price. Farmers can spray 100ml pesticide in 1 Bigha (33 decimal) land, which prices comparatively less than 6 sex pheromone traps, 6 colour traps, and other equipment or management costs.

Lack of available supply for the rural farmer

Farmers used different pest and disease management equipment, such as Yellow Sticky traps, Trichoderma powder, Sex Pheromone traps, etc. But the local dealer does not get available supply, so the farmer must pay high prices. There is a remarkable lack of organic products in the market for available supply.

Laborious and need continuous assessment

After installation, farmers need to continuous assessment and change the lure and water of the trap. On the other hand, they can spray the pesticide with less laborious management. So, farmer thinks it is more laborious and costly. Farmers responses about their aversion reason had focused on in Table 2.

Lack of management skill

Farmers do not get training for proper installation and management. So, when prominent farmers hire labour, they must train in their own effort. Farmers do not know how to set up lure, Bishtop (Attractant trap), colour trap, How to change the water, how to prepare Bio-pesticide, or how much duration needs to change the water of the sex pheromone trap.

Do not get rapid visible result

Farmers have been using pesticides and fertilizers for a long time. So, they expect very rapid results from organic equipment like synthetic chemicals. After using Vermicompost, the nutrient dissolve slowly and supply nutrients for the whole season. But, farmers expect visible results like Nitrogen fertilizer. After using Bio-attractant, they think it will kill pests like pesticides.

Reason for aversion to organic vegetable production

Farmers averted from organic vegetable to synthetic vegetable production. They had mentioned some reasons. The reasons for aversion of the farmers have shown in Table 3.

Table 3. Farmers' response about Aversion reason from the faced problem.

Most critical Factor	Respondent	
	Yes	No
Do not get rapid visible result	37	9
Lack of management skill	32	15
Lack of available supply for the rural farmer	46	0
Costly comparatively than synthetic chemical	41	5
Laborious and need continuous assessment	43	3
Motivated by pesticide agent	29	17
Same price as sprayed vegetable	46	0
Deteriorate the external shape and size of vegetable	42	4
Habituate to traditional practices	30	16
Availability of chemical	40	6

Table 3 proved that most farmers oppose organic vegetable production due to less supply of equipment and market linkage problems. When the equipment has less supply, its price will increase, and farmers alternatively take synthetic chemicals.

Deteriorate the external shape and size of vegetable

In the case of the Solanaceae family vegetable case, some fruit become curled, shrink, and are less attractive to consumers. On the other hand, sprayed vegetables become skinny, shiny, and attractive for consumers.

Habituate to traditional practices

Farmers become habituated to fertilizer and pesticide doses but do not know about measuring bio-tools and equipment. So they feel good about practicing known practices of synthetic chemicals.

Same price as sprayed vegetable

After harvest, farmers expect high prices for organic vegetables, but local people are unaware and pay the same fee. There is no good linkage with the supermarket or DAM (Department of Agricultural Marketing).

Availability of chemical

Bangladesh has many pesticide companies and fertilizer companies, but ISPAHANY is the only one that imports lures, color traps, and other organic products for farmers. So, farmers do not get an adequate supply.

Motivated by pesticide agent

Local pesticide dealers suggest farmers synthetic chemicals because they get more commission and interest than organic tools. Thus, the market has less supply of organic vegetable production equipment. So, farmers are motivated to take synthetic chemicals. The farmer always thinks the best doctor for the plant is the retailer pesticide agent.

Influence by old practices farmer

Old farmers did not believe in new technology and only accepted it in their own experience. The small farmer always follows the large farmers. So, they get suggestions about different pesticides from experienced farmers. Hence, they are habituated to synthetic chemicals they suggest the chemical.

Farmers worried about low yield

Farmers have a perception of new technology their production can reduce, so they do not try to practice new organic technology.

Laggard farmers

Laggards farmers and old-behavior of cultivation practices embedded in farmers for a long period: were not persuaded to use new technology. They only practiced their techniques, such as using a High rate of fertilizers and spraying over-dose pesticide without following residual intervals in the crop.

Large landholding farmers

Farmers feel that it is not sure about new technologies, particularly those farmers with large land. They doubt if the yield loss due to new technology in larger fields the amount of loss will be more incredible.

Conclusion

Food sustainability and security have become significant issues in the agricultural sector. Department of Agricultural Extension mainly suggests organic food production. But, practiced farmers are averting some problems, which are primarily costly compared to chemicals, lack of available supply for rural farmers, need continuous assessment, lack of management skills, and do not get rapid, visible results. Thus, deteriorate the external shape and size of the vegetable, the same price as a sprayed vegetable, Availability of chemicals, and motivation by pesticide agents also catalyze to averse them from organic vegetable cultivation. But, farmers want to practice if they get the available supply of organic agricultural products from the local retailer and available training from NGOs and GO.

Recommendation

The paper provides a better understanding of the factors influencing farmers to switch from organic farming. The key reasons for the farmers to switch were the abundant supply of organic inputs, lack of specific skill, the higher price of organic inputs, synthetic chemical inputs for crop production, and the same price of the vegetable at the consumers' level. Subsidies for organic farming inputs and regular and effective distribution of inputs to farmers, i.e., making the products available, are some ways to encourage them to continue with organic farming. Policy makers can take the initiative to introduce organic manure, lure, color trap, and Bio-pesticide brands at lower cost and effectively distribute through agriculture offices. Government-aided retail shops' organic products will also help to capitalize on consumers' positive attitudes toward organic farming.

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