Case study of farmers growing organic food products near Udaipur city

Abstract: Organic farming certainly holds significant promise, especially in ~~a~~ the country like India with its diverse agro-climatic conditions and rich tradition of sustainable practices. The move toward alternative agricultural methods is indeed becoming crucial. These methods often focus on sustainability and eco-friendliness, aiming to maintain or improve crop productivity while minimizing negative impacts on the environment. Techniques such as organic farming, integrated pest management, and conservation agriculture are gaining traction as they align with the need for more sustainable practices. To get an insight about the status of farmers growing organic crop and selling their produce in the market of Udaipur city, case study of farmers was done. The main crops grown were cereals, pulses and legumes, roots and tubers, leafy vegetables, other vegetables and fruits. Farmers were using vermi compost prepared at their farm as organic manure, *Amrit Jal* and *Amrit Mitti* as organic pesticide and fertilizer. All of them have very good financial, technical and marketing support from NGOs or from shopkeepers to whom they sell their organic produce. ~~They~~ Farmers were motivated by NGOs working in their village for their upliftment ~~of farmers~~. Farmers sometime face constraints of getting good quality seeds, lack of support from government and shopkeepers sometimes do not give good and timely profit. They also want to grow more and more varieties of food with higher productivity but they have financial constraints to buy big piece of land, quality seeds and organic manure.

Keywords: Organic crop, organic manure, organic produce, farmers, higher productivity.

Introduction

Agriculture facilitates to meet the indispensable needs of human civilization by providing food, clothing, shelter, medicine and recreation. Hence, agriculture is the most important venture in the world. India's agricultural sector is still very important and considered to be the backbone of Indian economy. However, in the 1960s, the Green Revolution allowed developing countries, like India, to overcome continual food scarcity by producing more food and other agricultural products by using high-yielding varieties of seeds, modifying farm equipment, and substantially increasing use of chemical fertilizers. Due to less accessibility of land it directed to increase in the use of chemical fertilizers and pesticides which cause serious damage to the environment and human health. Hence, high-yielding varieties are being used with infusion of irrigation water, fertilizers and pesticides. This combination of high-yielding production technology has helped the country develop a food surplus as well as contributing to concerns of soil health, environmental pollution, pesticide toxicity, and sustainability of agricultural production. Scientists and policy planners are therefore, reassessing agricultural practices which relied more on biological inputs rather than heavy usage of chemical fertilizers and pesticides.

Hence, the presence of chemicals and heavy metal content within the soil lead to the consumption of these harmful material through daily food intake by living creatures such as humans, animals *etc*.

Review of Literature

Kumari *et al.* (2014) reported that Indians take about 40 times more pesticides through food items than the average American intake. Findings suggested that agrochemicals especially phosphate fertilizers are a major source of inorganic arsenic in chronic kidney disease of endemic areas in Sri Lanka **(Jayasumana *et al.* 2015).**

Comment [p1]: Why is the Author name here?

It is evident from the study carried out in the three districts of Barak valley (Cachar, Karimganj and Hailakandi) Assam, that the farmers often use pesticides ranging from high to extremely hazardous categories like organochlorides, organophosphates and carbamates. Lack of adoption of adequate protective measures were noticed to have increased the declining state of the health of farmers in the region **(Dey *et al.* 2013).**

An answer to this havoc is the organic farming, an environmentally friendly agricultural approach which ultimately leads to proper human health. Organic farming relies on crop rotations, crop residues, animal manures, legumes, green manures, off farm organic wastes, and aspects of biological pest control to maintain soil productivity and tilt, to support plant nutrient and to control insects, weeds and other pests **(Sharma and Kaur, 2013).**

Comment [p2]: This is not the right way to start a sentence, Here you have not discussed about the problem yet started the sentence by saying havoc. Hence, rewrite the review.

The market segment of organic product is still in its infancy stage so there is the need to encourage the concept of organic farming among Indian farmers. High prices, high logistics cost and insufficient demand were three challenges faced by the organic marketers **(Sakthirama, 2014)**. However, knowledge of organic products as well as action taken by the government either to inform or to create awareness has not reached the satisfactory level in encouraging sustainable purchase with organic products **(Ragavan and Mageh, 2013).**

Methodology

Case study of farmers practicing organic farming was conducted with the help of interview schedule regarding the practices adopted for organic farming. The interview schedule included the questions related to background information, types of crops grown, irrigation system and agricultural practices adopted, motivation, support system, manure used, advantages and constraints faced while growing and marketing of organic food products.

Results

In this phase the researcher has collected the qualitative data which has been systematically presented under the following heads:

CASE STUDY: 1

Background information

Mr. A was 45 years old farmer practicing farming since last 18 years. His farm was situated in *Birothi* village approximately 50 Kms away from Udaipur city. He himself was the owner of farm. Total area of farm was 5 *bigha* (3.125 acres). He belongs to nuclear family system with wife and 3 children. His wife was homemaker as well as a farm woman rendering help in farming activities. The total farming activities were performed by the family members only. They adopted mechanized and non-mechanized farming practices. He borrowed the tractor for ploughing the field and had one bullock plough. He owns 3 cows, 1 pair of ox and 6 goats. He owns a *pucca* house near the farm. He did not have his own private vehicle and used public transport to carry organic food products to the shopkeeper for sale. He also used the transport facility provided by the shopkeeper. He earns approximately Rs 3-~~Rs.~~ 3.5 lakh per annum.

Crops grown

The main crops grown were wheat (varieties: kalyan sona and pahrmi), maize and barley, bengal gram (*chana)*, black gram *(urad)*, green gram *(moong)* and cow pea (*chavle*), potato, reddish and sweet potato, spinach, fenugreek leaves, lady's finger, bottle guard, cauliflower and cabbage was grown in his field.

Irrigation system and agricultural practice

The soil of his farm was *domat* soil and had an open well for irrigating the crops which can be easily seen from Plate 1. They also relied on rain water for irrigating crops during monsoon. Crop rotation practice was adopted by him. He kept on rotating the different things grown in his farm.

Plate 1: Open well in the farm for crop irrigation

Motivation

Earlier this farmer was working as field worker in *Mahan Seva Sansthan*. *Mahan Seva Sansthan* works in the tribal dominated, drought prone districts of Udaipur and Dungarpur in Southern Rajasthan, focusing on the blocks of Jhadol, Kotra and Kherwara in Udaipur District. *Mahan Seva Sansthan* has been involved in the implementation of vermi compost units in the villages. From this organization he got an idea of preparing vermi compost (can be seen from Plate 2).

Plate 2: Farmer A preparing vermi compost at the site

Support system

Three major types of support system were taken by the Farmer A. He reported that he had received financial support for setting up of vermi compost pit from *Gramin* Bank with the help of an organization called Access. Access is a national livelihoods support organization, with focus on incubating innovations for sustainable livelihoods of the poor. Financial support was also given by the family. He has contributed initially Rs. 50,000 from his own savings. This organization and shopkeeper, to whom he sells his produce, provide technical support to the farmers by inviting agricultural scientist, providing quality seeds to the farmers, organizing training at KVKs *etc*. Further, marketing support was given to him by the shopkeeper who was selling his organically grown food products in the city and assured him to purchase all the farm produce on regular basis at a good market price. He is also receiving full physical, mental and psychological support from his family members also.

Manure used

He has never used any chemical pesticides and fertilizers in his farm since last 18 years. Initially he was using cow dung and cow urine as a fertilizer and pesticide in his farm. He expressed that he is totally using vermi compost as organic manure (Plate 3) prepared by himself at his own farm which is made out of agricultural and animal waste.

Plate 3: Prepared organic fertilizer at farm

Advantages

Farmer expressed that, after using a combination of all the three-support system *i.e.*, for organic farming they had started gaining more profit and increased crop production. The quality of land also improved and they had psychological satisfaction with the feeling that they are not harming the earth through farming. He also expressed that he had gain knowledge about the harmful impact of pesticides on health and land. He gained lot of popularity in his social circle and now he has become one of the progressive farmer who is encouraging other farmers to go for organic farming in his village.

Plate 4: Farm of the Farmer A with grown organic crop

Constraints

Farmer said that he has not faced much of problems while doing organic farming as he was already a field worker and was having well versed knowledge of farming. He also mentioned that he came in contact with the owner of shop selling organic food products who gave him better price for his organic products. But he also mentioned that still government need to boost up and provide some kind of support to create awareness regarding organic farming and to promote organic farming. He also said that he wants to become a wealthy farmer and wants to enlarge his business but does not have big piece of land. Establishment of ware house and cold storage in the village is also required so that their produce can be stored in good condition for longer duration.

CASE STUDY: 2

Background information

Mr. B is a farmer of 55 years having his own farm situated in *Birothi* village which is approximately 50 Kms away from Udaipur city. Total area of farm was 2 *bigha* (1.25 acres). He belongs to joint family system in which there were in all 8 members. The total farming activities were performed by the family members only. He owns 2 cows, 1pair of ox, 3 goats and 4 rabbits. They adopted mechanized and non-mechanized farming practices. He borrowed the tractor for ploughing the field and had one bullock plough. He owns a semi-*pucca* house near the farm. He used public transport facility for coming to Udaipur city. He does not have private vehicle and use public transport to sell the organic food product to the shopkeeper. He also uses the transport facility provided by shopkeeper. His source of income is only through organic farming. The total income from farming was Rs 2-~~Rs~~ 2.5 lakh per annum. Apart from this his sons were also getting income of Rs. 70,000 per annum. ~~Thus~~Thus, his total family income was approximately Rs. 2.7-Rs. 3.2 lakh per annum.

Crops grown

The main crops grown were among cereal wheat (kalyan sona), and barley, bengal gram (*chana)*, green gram *(~~moong)~~ ~~and~~moong)* and cow pea (*chavle*), potato, reddish, carrot and sweet potato, coriander leaves, spinach and fenugreek leaves, lady's finger, brinjal, bottle guard, bitter gourd and cauliflower were grown in his field.

Irrigation system and agricultural practice

For irrigation of the crops, he was dependent on rain water during monsoon and his neighboring farmer's water resource, as he was not having his own well. He hired the help on payment basis as per the number of hours water facility is used for irrigation. The type of soil in his field was *domat* soil. Crop rotation practice was adopted by him.

Motivation

Farmer B has mentioned that Farmer A of his own village who was doing organic farming since long as mentioned in the case study of Farmer A. Farmer A was the person who only told him to practice organic farming, the importance of organic farming and vermi composting. Farmer A was helping him in getting quality seeds, preparing vermi compost at his field and marketing his farm produce in Udaipur city.

Support system

Farmer B reported that Farmer A helped him in getting the financial support from an organization called Access for establishing vermi composting pit at his farm. His vermi composting pit can be seen from Plate no. 5.

Plate 5: Farmer B with his vermi compost pit

Manure used

Initially when he started farming, he was using chemical based fertilizers and pesticides in his farm. He expressed that by using those chemicals the land quality of farm deteriorated. But since he started preparing his own vermi compost as an organic manure he totally shifted to organic farming. Apart from this, he was also using cow dung mixture with cow urine as a soil conditioner.

Advantages

After starting organic farming, he earned more profit as compared to conventional method of farming. The quality of land also improved and hence felt that his land productivity is increased. He felt no burden of debts for the purchase of chemical fertilizers. He has also gained lot of knowledge about making vermi compost and can render knowledge to other farmers also.

Constraints

He faces financial crunch in buying quality seeds, hiring transport facility. He was also facing irrigation problem as he does not have his own well. He wants to increase his income from farming to have better life but has small piece of land and can't afford to buy new land. Sometimes he faces problems in transporting the organic produce to the market well in time. Many a times he does not receive his profit timely.

Plate 6: Farmer B's farm with organic wheat crop

CASE STUDY: 3

Background information

Farmer C aged 49 years was doing organic farming since last 9 years. His farm was situated at Village Mokat of Block Sarada in the Udaipur district of Rajasthan State. Total area of farm was 2 *bigha* (1.25 acres). He himself was the owner of the farm. He and his wife were qualified upto 8^{th} and 5^{th} standard respectively. He was belonging to nuclear family with 5 family members. Farming was his main occupation with rearing of cattle too. He owned 4 cows, 2 pairs of ox, 8 goats, 4 rabbits and 4 hens. He adopted mechanized and non-mechanized farming practices. He was having his own tractor for ploughing the field and had two bullock ploughs. He owns a pucca house near the farm. He hired public transport facility as well as has his own motorcycle for coming to Udaipur city. He used public transport facility to sell his organic food products to the selected shopkeeper in the Udaipur city. He approximately earns Rs 3.5- ~~Rs.~~ 4 lakh per annum.

Crops grown

The main crops grown by Farmer C were wheat, maize, barley and rice, bengal gram (*chana),* black gram *(urad),* green gram *(moong)* and cowpea *(chavle)*, potato, reddish and sweet potato, spinach, coriander leaves and fenugreek leaves lady's finger, bottle guard, capsicum, green chili, cauliflower, cabbage, tomato, guava, pomegranate and banana.

Irrigation system and agricultural practice

The type of soil found was brown soil. They also had their own open well in the farm for the water facility and irrigation which can be easily seen from Plate 7. Rain water was another source of irrigation during rainy season. He adopts sustainable agriculture practices which means greater production in smaller area. For harvesting was done on his farm. For this he took help of family members, and machines.

Plate 7: Open well situated at farm of Farmer C

Motivation

He mentioned that he came in contact with CEO of a NGO named as Gayatri Seva Sansthan who motivated him for organic farming. Gayatri Seva Sansthan has its own rural training centre in his village where he attended many trainings and inspired by trainers to whom he came into contact. He also mentioned that now he also delivers a lecture for organic farming and more farming in smaller field among the farmers.

Support system

Full assurance was given by officials of NGO in all means such as technical, financial and marketing support. NGO helps in getting the good quality seeds and plants to him. The fencing of field was also made with the support of this NGO to avoid stray animals in his field. From family he got a great extent of psychological support.

Manure used

In case of Farmer C the organic manure and pesticide used were different from two previous farmers. He was using *Amrit Mitti* (Plate 8) and *Amrit Jal* (Plate

9) in his field. Ingredients for *Amrit Jal* included cow dung (1litre), cow urine (1 liter), jaggery (50 grams) and water (10 litres). All the above ingredients were mixed together and kept for three days. Mixture was stirred, clock and anti-clock wise 2 to 3 times in a day. Next day, he took one liter of this concentrate mixture and mixed it with 10 liters of water. This preparation is called *Amrit Jal.*

For composition of *Amrit Mitti* Farmer C collected topsoil (found below big trees or under the bushes) by scrapping (only1 cm). This topsoil contains essential minerals along with dormant forms of microbes. The microbes become active in topsoil when mixed with the moist biomass. Further, Framer C collected different kinds of green biomass from surrounding areas, chopped them and allowed them to dry. Farmer C then soaked the dried leaves in *Amrit Jal* for 24 hours. This *Amrit Jal* also generates microbes, which help to accelerate the decomposing process. Afterward, this was spreaded in the field. One layer of this soaked biomass and then one layer of topsoil and was spreaded in the ground. He then sprinkled *Amrit Jal* to moist the topsoil. Farmer mentioned that thus alternating layers were made which helps to increase the depth of manured soil area. This accelerates the decomposing process. During the complete process the heap of soil was kept moist by sprinkling it with *Amrit Jal.* Thus "*Amrit Mitti*" was formulated and ready to be used as manure in 30 days.

Plate 8: Crop of lady's finger grown in *Amrit Mitti* in the farm of Farmer C

Plate 9: Prepared *Amrit Jal* at the farm of Farmer C

Advantage

After starting organic farming, he had received good profit and he believed that the production may be increased in the future. The quality of land had improved. He gained good knowledge about preparing organic manure and organic farming methods. His social circle had also increased as he had attended many trainings and now he also delivers lectures in farm training programmes. He also mentioned that the decision to go for organic farming helped him financially which have improved the standard of living also.

Constraints

He did not report any of the problem related to distribution system, less income and less production. He also mentioned that Gayatri Seva Sansthan played an important role as a boon in his life and village as the member of Gayatri Seva

Sansthan introduced him with organic farming and now they are also working in improving the green cover of their village. He further added that other farmers of Rajasthan State should also opt for organic farming and it can be only possible if government also plays an important role in creating awareness among farmers. He, has expressed that only problem he is facing is he does not have lot of finance to purchase a big piece of land for growing more organic crops and become a progressive farmer.

Plate 10: Farmer C showing his fruit orchard to the investigator during her visit

CASE STUDY: 4

Background information

Farmer D was a female farmer of 46 years of age and was doing organic farming with her husband and three sons since last 6 years. Her farm was situated at Village Mokat of Block Sarada in the Udaipur district of Rajasthan State. Total area of land she had was 5 *bigah* (3.125 acres). She was not qualified and her husband was qualified upto 8th standard. She belonged to nuclear family with 5 family members. Farming was their main occupation with rearing of cattles too.

She had 2 cows, 1 pair of ox, 9 goats, and 2 buffaloes. They adopt mechanized and non-mechanized farming practices. She was having her own tractor for ploughing the field and had one bullock plough. She owns a *pucca* house near the farm. Her home was electrified and having appliances like T.V, cooking gas, dish connection, refrigerator, mixer, fans *etc*. Her family members used public transport facility for coming to Udaipur city. She used public transport to transport the organic food product to the selected shopkeeper for market survey. Her family earns approximately Rs 2.5-Rs.3.00 lakh per annum by farming activities. Her two sons also work as labourer in Udaipur city during lean period.

Crops grown

The main crops grown by Farmer D were wheat, maize and barley, bengal gram (*chana)*, black gram *(urad)*, green gram *(moong)*, Red gram (*Arhar/Toor*) and Lentil (*Massor*), potato, reddish, carrot, ginger and sweet potato, spinach and fenugreek leaves were grown, beans, bitter gourd, bottle gourd, brinjal, cabbage, cucumber, lady finger, pumpkin, ridge gourd and *tindori*, guava, mango, papaya, orange, and pomegranate.

Irrigation system and agricultural practice

The type of soil found was brown soil. The source of irrigating the crops were rain water during the monsoon and open well situated in the farm area (Plate 30). Farmer adopted crop rotation system which would give them the best results in organic farming. They also believe in sustainable agricultural practice, by using less space between the plants in order to prevent the loss of moisture from the soil. The technical information about this practice was very well informed to the farmer by NGO working in their area.

Plate 11: Open well in farm of Farmer D

Motivation

The farmer has attended many trainings, demonstrations and camps organized in their village by Gayatri Seva Sansthan, after getting lot of information on advantages on organic farming and assurance of help in all manner from the NGO.They received the quality seeds and plant sapling from the NGO with the instruction that they have to take utmost care of them. NGO workers keep coming for regular check that the farmer is taking proper care of the plants or not. If there is any problem in the field related to soil, plants, organic manure *etc*. NGO arranged the visit of experts and subject matter specialist to guide the farmer.

Support system

Farmer reported that her family received financial support from NGO which helped them to develop a fruit orchard (Plate 12) in their farm. Farmer was one of the beneficiaries of an Indo German Watershed Development Programme in which the financial support was given to the NGO for disbursing money to farmers in the village who were growing crops organically. NGO also helped the farmers in covering the orchard with net to protect the fruits from birds and also helped in fencing the field to protect the crop from stray animals. Marketing support was provided to the farmer by one of the selected shopkeeper.

Plate 12: Guava orchard of Farmer D

Manure used

They used both *Amrit Mitti* and *Amrit Jal* (Plate 13) as organic manure in their field.

Plate 13: *Amrit Jal* in farm of Farmer D

Advantages

After adopting organic farming, by the farmer the land quality was improved, production and quality of crop grown was increased. She further expressed that now her family members have gained a lot of knowledge regarding various agricultural practices which are environmentally sound and sustainable. She feels that now she is one of the most satisfied farmer and wants to grow more and more organically. The shopkeeper to whom she sells her organic produces gives her good profit and promised to purchase more and more from her at premium price.

Constraints

The farmer did not mention much of the problems regarding organic farming system. It was just reported that prior to support received from NGO they use to face financial and technical problems. Previously the fruit orchard was destroyed by the attack of birds but now NGO has helped in covering the whole fruit orchard through net. Further, no stray animal can enter in the field as they have also covered the sides of farm with iron poles and wires. It was also mentioned that whenever any problem arises the officials of NGO immediately takes action to solve them.

Plate 14: Researcher and Farmer D in the farm

Conclusion: Case study of four farmers who were growing organic food products in their own farms near Udaipur city as well as selling these food products to one or more of the selected shopkeepers for the market survey was conducted. An effort was made to convey the shopkeepers and consumers problems to improve the production and sale of organic food in the market of Udaipur city. All of them have very good financial, technical and marketing support from NGOs or from shopkeepers to whom they sell their organic produce. They were motivated by NGOs working in their village for upliftment of farmers.

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