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STUDY ON IMPACTS OF ORGANIC FOOD PRODUCTION TO THE ENVIRONMENT A CASE OF KAZI & KAZI TEA ESTATE LIMITED, PANCHAGARH, BANGLADESH

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Abstract: Study on environmental impact of organic food production to the environment was conducted over the period of four months concentrating exclusively in the Kazi & Kazi Tea Estate Limited (KKTE) in Panchagarh district. The main objective of this study was to make an assessment on environmental impact of organic food production. In order to get qualitative information, data were collected through FGDs and KIIs. Organic food is free of harmful chemicals, tastier and healthier than conventional foods, and can be stored more days than chemical foods. Every one articulated the negative impacts of conventional foods. The role of organic production to the environment is inevitable with positive sign. KKTE is playing great role in raising awareness on environment among the workers and community people through training and supporting hardware. Respondents were mentioned that KKTE is playing great role in environmental conservation by planting trees, organic farming and using renewable energy. Such organic production is offering diverse products in the local to national and international market including vegetables, tea, herbal tea, ghee, honey and sweets. Organic production is releasing less carbon by using nature friendly inputs and renewable energy and promoting for communal uses including solar energy and bio-gas plant. Chemical contaminations from others conventional farming are the main problem for organics. Lack of awareness and training is the main hindrance in popularizing the organic foods. Appropriate policy support, incentives, organic food fair may create greater awareness among the mass people. It is recommended that if the perceived problem could be solved by setting up of more tea processing industries, competitive markets at the grass roots for organic foods, supply of natural gas and resolving problems could accelerate the production of organic food production, organic regulations, policy support, training and advocacy would be the pathway for sustainable development.

Keywords: Bio-pesticides; bio-fertilizer; organic production; organic farming; renewable energy.

1. INTRODUCTION

Impact studies may compact with a variety of interventions-be they social, economic, environmental, political or otherwise in different sectors. The notion of impact in itself is very blurred and all-inclusive; it can mean anything and everything. Impact may be economic, social, political, environmental, technological or institutional and a host of other things. A simple definition of impact is that it is the change brought about by a certain action. Food can any substance, composed of carbohydrates, water, fats, proteins and water that is eatable or drinkable by animals including humans for nutrition or pleasure. Organic food is produced without using most conventional pesticides; fertilizers made with synthetic ingredients or sewage sludge; bio-engineering; or ionizing radiation. Organic food is usually motivated by a personal desire to improve one's own health and/or healthy family members. Organic food is free of harmful pesticides,

and that organic growing techniques can mitigate global warming, and it's clear that organic farming can benefit anyone, on any continent.

The quality of food has definitely gone down since the Second World War. The level of vitamin C in today's food no bear resemblance to the level found in wartime food. In contrast, conventional farmers don't build the soil, and use synthetic fertilizers, which do not support soil micro-organisms. The pesticides enter our soil, wells, lakes and oceans and disrupt ecosystems. Pesticides run off into the oceans and create "dead zones" where algae are over grown and oxygen levels will not support aquatic life. Peeling and washing produce may reduce some of the pesticides but doesn't eliminate them all. Many folks are becoming aware of these problems and are seeking out organic food. It's getting easier to find organic food in the grocery store.

Responding to consumers' information needs appears as a key factor in the solution to the trust issue [1]. The way consumers make food choices can be complex and vary widely, but as Brunso and colleagues [2] postulated, there seem to be four quite universal dimensions in quality perception: taste and appearance, health, convenience and process. In accord with previous cognitive studies [3], when making reference to general motivations for buying organic products, European consumers mention above all aspects associated with health and well-being. Organic products can be seen as a bundle of characteristics that consumers recognize and appreciate, both physical (perceivable attributes) or abstract, and perceived in the form of cues [4].

KKTE broke the barrier by establishing a tea garden on land that previously lain fallow using innovative organic and nature-friendly farming methods. It has secured organic certificate including EU and NOP Regulation.

In the farming practices, KKTE uses only natural friendly measures for pest and weed controls, avoiding synthetic chemicals to makes use of only renewable resources and keeps the soil's fertility. These sound practices demonstrate the garden's efficiency to protecting both human health and nature. Kazi & Kazi Tea Estate limited is operating its activities in Panchagarh district including organic farming and diversities. Kazi & Kazi Tea Estate is the pioneer in organic tea plantation in Bangladesh. KKTE is also a composite garden, having dairy, herbal plantation and other agricultural products such as rice, wheat, corn, oilseed, fruits, pulses and vegetables, all are organically grown.

1.1 OBJECTIVES: BROAD & ASSOCIATE

The broad objective of this study was to know the environmental impact of organic production to the environment. The other associate objectives of the study were:

- To know community perception towards KKTE organic production
- To find out the changes due to KKTE organic interventions
- To know the impact of organic farming
- To evaluate the role of organic production to the various dimensions of organics and environmental conservation
- To find out drawbacks and limitations of KKTE
- To put forward sound recommendations & solutions based on findings to overcome drawbacks and problems

2. METHODOLOGY

This is basically participatory approach and all of information was gathered through active participation of the respondents, stakeholders and community people. The study was concentrated in Panchagarh. The first step of designing appropriate methodology was to formulate the study design followed by definition of impacts and identification of findings. The methodology that has been used to undertake this study was based on: Community consultation (Focus Group Discussions) and Key Informants Interviews and notes were taken as part of the one-on-one community consultation for the impact study.

The key feature of sampling strategy was finalized after pre-field visit and documents review. In this study random sampling was followed in selecting respondents for FGDs and KIIs from study sites. The survey was based on following criteria:

- (i) In order to get qualitative information data were collected through 20 FGDs with each respective respondent (Two FGDs from each unit, one FGD with the KKTE workers and another one FGD with

outside KKTE people). 12 participants were in each FGD of which 6 participants male and 6 participants female to get real picture of the study areas.

- (ii) Total 50 respondents were interviewed through structured KII formats (5 persons from each unit: One Govt. Official, one UP member/chairman, one KKTE regular staff, one KKTE male worker and one KKTE female worker)

Given its aims and objectives the study employed random sample. Total 50 persons were interviewed with guided semi-structured questionnaires. The study addressed difficulty by relying partly on qualitative techniques, including key informant interviews and focus groups, semi-structured questionnaires and purposive surveys, and qualitative research at the community level.

3. RESULTS: NATURE FRIENDLY FOODS AND SUATAINABLE DEVELOPMENT

3.1 Study population

Analyzing sample respondents, data showed us that 100% respondents were male from staff and 50% respondents were female from workers. On the other hand, 80% respondents were male from government officials and UP members. The average age was 35 years with the range from minimum 27 to 48 years among the staff and 21 to 60 years among the workers. The government officials and UP members were in between 30 to 65 years old (Table 1).

Among the governmental officials and UP members 65% respondents were hold secondary education followed by university degree and primary education. On the other hand, 40% respondents were possess university degree among regular staff and 55% respondents were belongs to secondary education among the workers.

Table 1 Respondent’s analysis by sex, age, education, occupation and income

Type	Sex		Age	Education	Household members	Income	Occupation
	Male	Female					
Govt Officials/ UP members N=20	16(80) ^a	4(20)	47 (30-65) ^b	Primary-3(15) ^a Secondary-13(65) ^a University-4(20)	7(3-13) ^c	21750 (3,000-1,20,000) ^d	UP-10 (50) ^a Service-10(50) ^a
Regular staff N=10	10(100) ^a		35 (27-48) ^b	Secondary-5(10) ^a University-4(40) ^a Others-1(10) ^a	6(3-13) ^c	15344 (3600-35000) ^d	Service-10(100) ^a
Workers N=20	10(50) ^a	10(50)	36 (21-60) ^b	Illiterate-6(30) ^a Primary-2(10) ^a Secondary-11(55) ^a University-1(5) ^a	6(2-12) ^c	5997 (600-25000) ^d	Worker 20(100) ^a

*^a Percent value, *^b Age range in years, *^c Person in numbers, *^d Income range in BDT

3.2 Nature Friendly activities for organic production

All of the activities in organic productions are purely nature friend and coincide with the principles of organic farming. As per study report, 100% respondents opined that KKTE is doing nature friendly farming activities of whom 40% agreed for use of organic inputs, 15% for avoiding chemicals, 15% for planting lot of trees and 10% for organic systems (Fig 1). 100% respondents from regular staff were agreed that KKTE is doing nature friendly farming activities of which 40% were mentioned that organic inputs are used followed by no use of chemicals (20%) and only used nature originated bio-fertilizers (20%). 90% respondents from government officials/ UP members were mentioned that KKTE is doing nature friendly farming activities (Fig 2) and 75% respondents were mentioned that they are aware about KKTE farming

activities and has clearly mentioned that KKTE is doing nature friend farming activities through avoiding chemicals (15%), using organic inputs (15%), using bio-fertilizers (10%) adopting organic principles and planting lot of trees (5%).

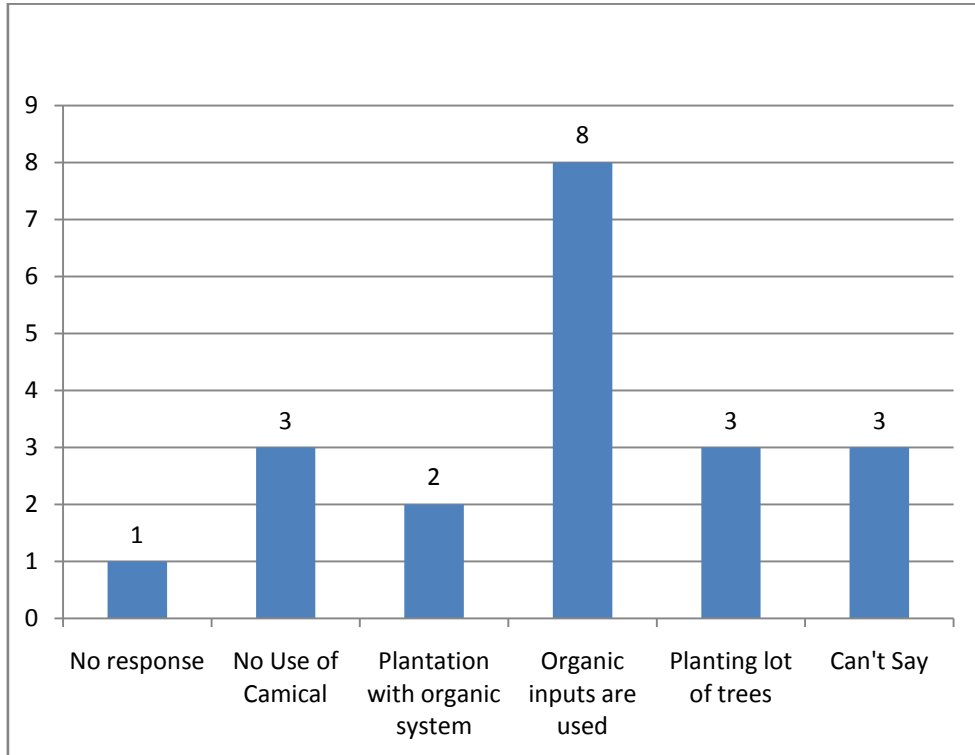


Figure 1: KKTE's nature friendly activities

3.3 People's Perception towards Chemical Farming

55% respondents agreed that chemical farming creates severe problems to health followed by environmental pollution, decrease of soil fertility. Only 10% respondents have no idea on it (Fig 2). Majority of the respondents from staffs were mentioned that health hazard (60%) is the prime concerned in chemical farming(Fig 3)followed by polluted environment (20%) and soil fertility decreased (10%).

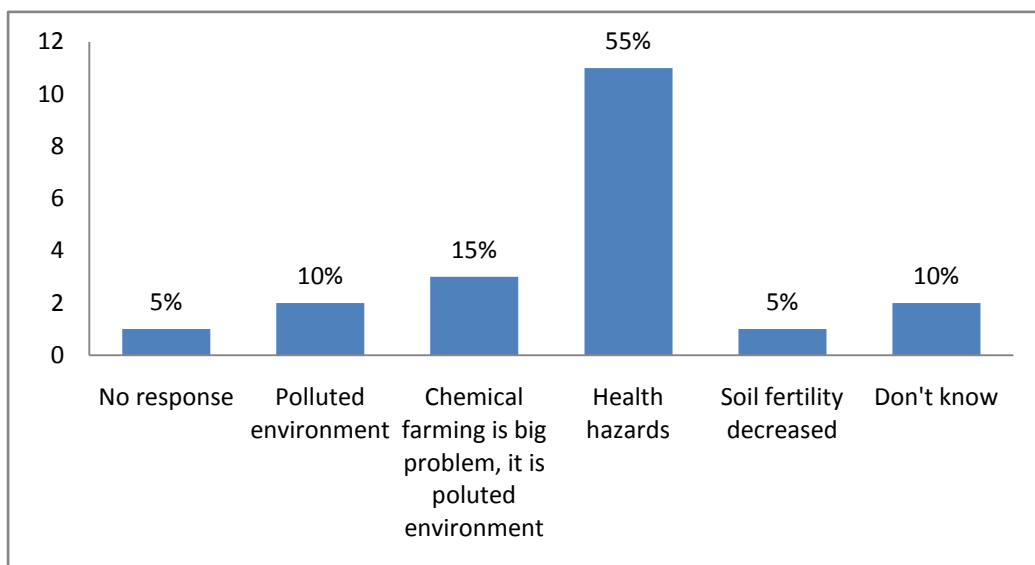


Figure 2: Workers perception on chemical farming

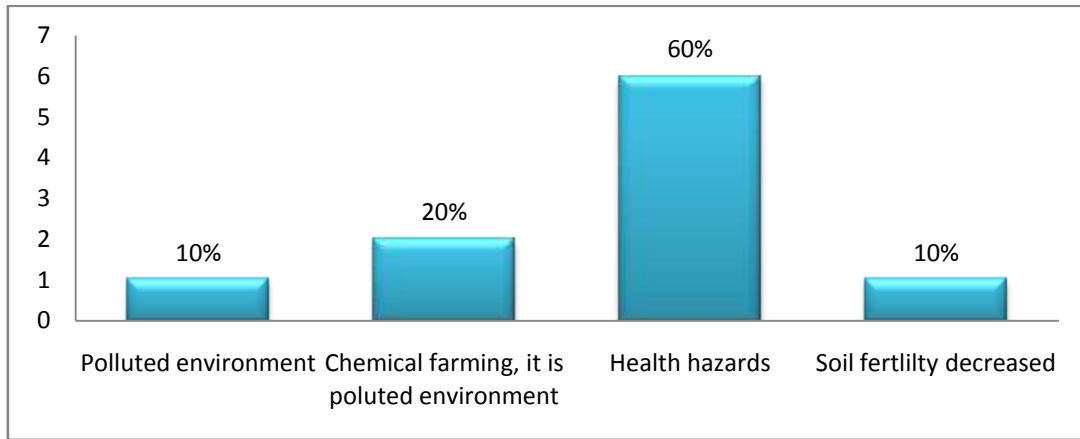


Figure 3 Staffs perception on chemical farming

3.4 How they distinguished chemical farming & organic farming?

45% respondents were opined that organic farm never pollutes the environment. 20% respondents were mentioned that they can easily distinguish organic farm from chemical farm based on input utilization i.e. organic farm use only organic inputs avoiding chemical inputs. On the other hand 10% respondents were mentioned that they have no idea on it (Fig 4).

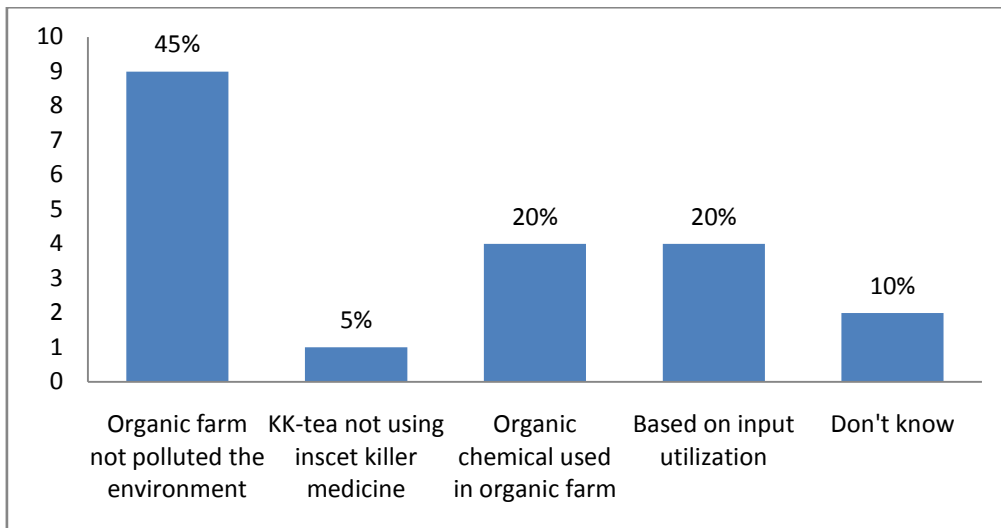


Figure 4 workers opinion on chemical vs. organic farming

40% respondents from regular staff were mentioned that organic farm never pollute environment and only use organic inputs. 20% respondents were able to distinguish between chemical & organic farming based on input utilization (Fig 5).

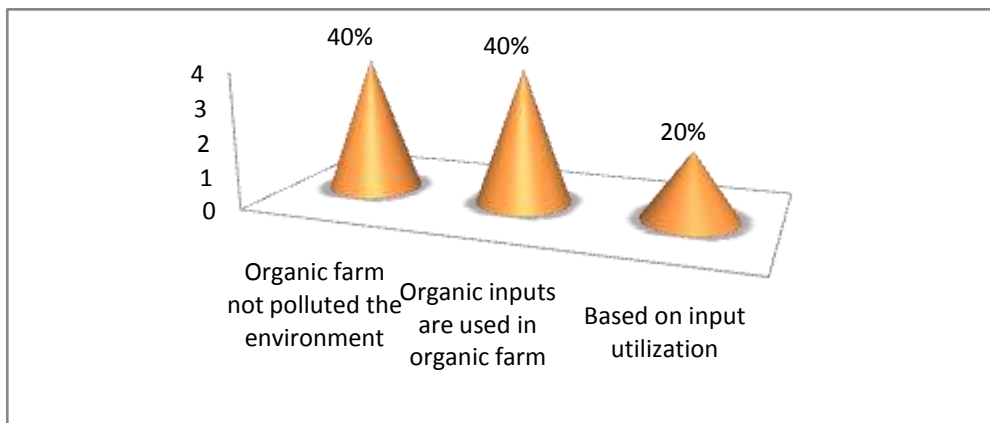


Figure 5 Staffs perception on chemical vs. organic farming

Among the government officials/UP members, 35% respondents were mentioned that organic farm never pollute environment (Fig 6) followed by chemical farming is bad for health (25%), no chemical used in organic farming (15%).

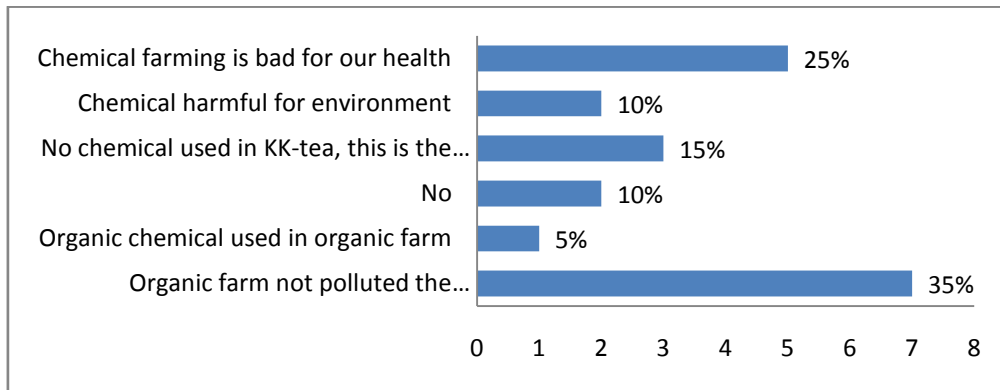


Figure 6 Government officials/UP member's opinion on chemical vs. organic farming

3.5 Benefits of organic farming

Organics ensure clean foods meaning healthy. Healthy foods meaning natural, no preservatives or additives, naturally made that preserve health. According to World Health Organization health may be defined as the state of complete physical, mental and social well-being and not merely the absence of disease and infirmity. So we should care of it. The respondents were mentioned few benefits of organics. 65% respondents were agreed on the benefits of organic farming of which 15% respondents were mentioned that suitable for human health, 5% agreed on friendly environment followed by improve soil fertility though organic practices, supply of fresh air & water. Only 5% respondents have no idea on it (Fig 7).

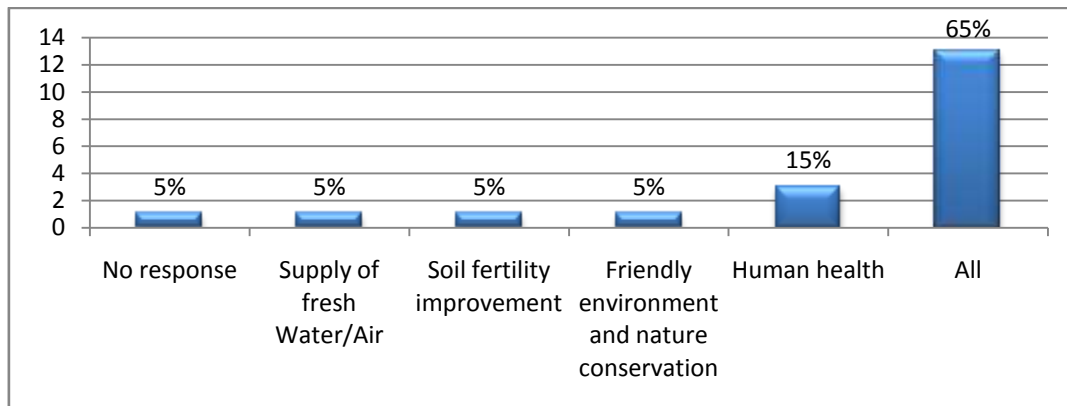


Figure 7 Benefits of organic farming

50% respondents from regular staff were able to mention the health benefits of organic farming (Fig 8) followed by supply of fresh water and air (20%), gradually increase production with low inputs (10%) and avoid chemical hazards (10%).

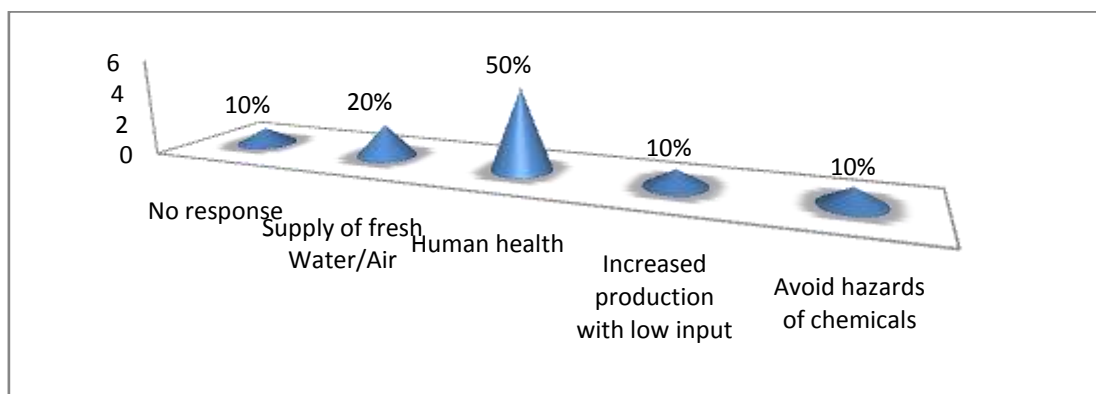


Figure 8 Benefits of organic farming from staff point of view

On the other hand, 70% respondents from government officials/UP members were mentioned that health benefits are the main concern of organic farming (Fig 9) followed by soil fertility improvement (15%) and friendly environment (10%).

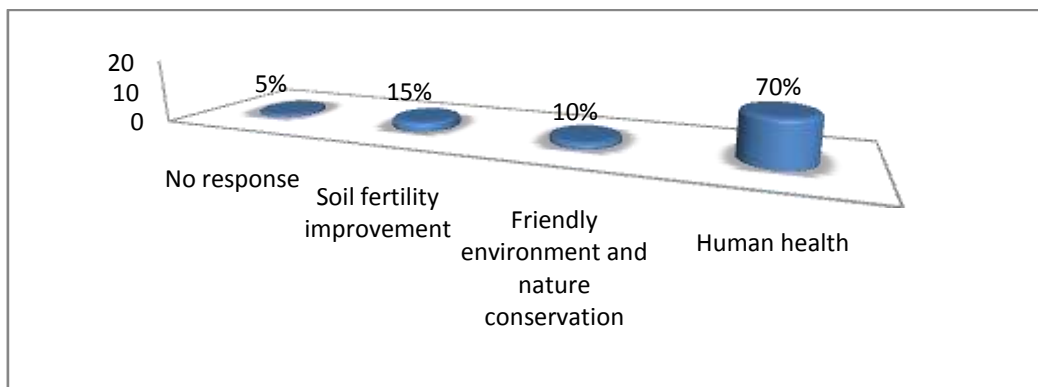


Figure 9 Benefits of organic farming from government officials /UP member's point of view

3.6 Organic works for environmental conservation

Greening was perceived as the prevalent cultivating practice in Panchagarh, Bangladesh. It was attributed to diverse and complex motivations that include brought fallow lands under green cultivation; land conversion from unused to better utilizations; land conversion from traditional use to tea plantations; professional organic training that emphasizes single solutions and practices.

There was no differences in opinion among the respondents about the impacts and potential impacts; responses ranged from ideological to practical. For some respondents, greening was perceived as a useful and necessary land management tool, resulting in economic efficiencies and increased incomes in the organic cultivation. For other respondents, chemical farming was perceived as having negative impacts on the environment, and as reducing aesthetic qualities of an area. In case of organic farming, more faunal and floral diversity is found which support sound environment in the sustainable agriculture. Huge numbers of positive impacts were found in the organic farming including uses of local varieties, naturally available ingredients for farming practices.

Narrowly defined, environmental impacts of the chemical farming were confined to the presence or residual effects on environment. Among the more commonly identified negative impacts were soil erosion; Health hazards; lowered water quality and amount of water; reduction in the biological diversity of crops, resulting from conversion of diverse and wildlife habitats to monocultures habitats.

90% respondents were mentioned that KKTE is playing great role in environmental conservation by planting trees, organic farming and using renewable energy. Community can take part in the environmental conservation by planting trees in their homesteads (30%), adopting organic farming practices (20%), and avoiding chemicals (Fig 10).

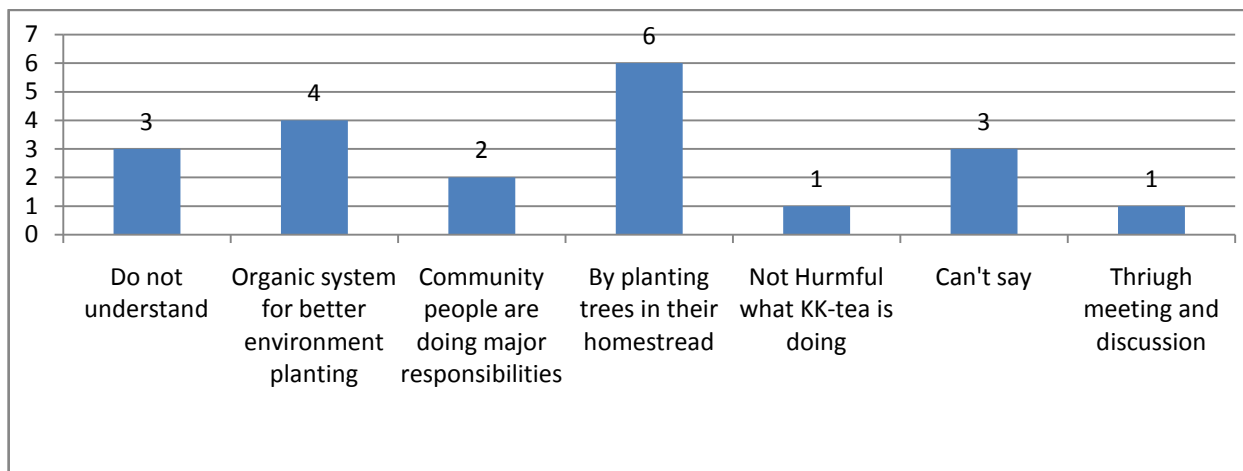


Figure 10 role of organic farming in environmental conservation

100% respondents from regular staff were mentioned that KKTE is playing great role environmental conservation (Fig 16b). The community people can take part in environmental conservation by adopting organic practices (30%) followed by planting trees in their homestead (30%), using only organic inputs (20%) and planting indigenous medicinal plants (10%).

85% respondents from government officials were mentioned that KKTE is doing nature friendly activities and playing great role in environmental conservation. Community people can take part in environmental conservation by planting trees in their homesteads (40%), adopting organic practices (20%), by raising awareness (15%) and through meeting and discussion (10%).

3.7 Products and farming diversity of KKTE

Based on production principles in organic, it supports wide range of varieties in the cultivation practices. KKTE is offering wide range of products for community people to national market as well as in the international market. In the tea sector, KKTE has developed diverse type of teas including pure tea, herb teas, spices (masala) tea and blended teas. Among these Orthodox black tea, CTC black tea, green tea, white tea, vasaka tea, tulshi (Basil) tea, neem tea, pudina (mint) tea, ginger tea, lemongrass and masala teas are remarkable. Another important product is dairy products including fresh milk, sweets, ghee, cheese and butter. Among agro products rice, vegetables, wheat, pulses, mustard, oil and honey are the more popular products.

In case of farming, KKTE evolved diversified farming activities including growing of agricultural crops, dairy, tea and herbs covering 800 ha of land. KKTE is offering diverse products in the local to national and even crossing international boundaries. 55% respondents were recognized tea, sweet, ghee and honey another 20% were recognized tea, basil tea, lemon grass, mint tea, ghee, honey and sweets. Another 5% were identified vegetables, rice and other crops mentioning high quality and purity of the products (Fig 11).

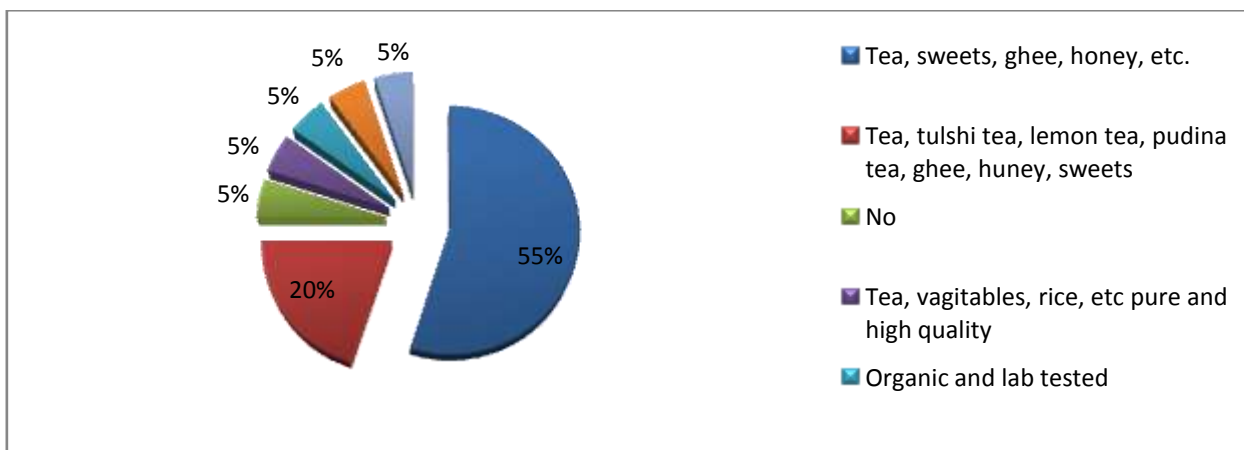


Figure 11 Product diversity in KKTE

70% respondents from regular staff were mentioned that tea, sweets, ghee and honey are the organic products offered by KKTE, while 10% were mentioned only tea another 10% added herb teas (including tulshi, mint and lemon tea) and only 10% respondents were mentioned that high quality of the products adding rice and vegetables.

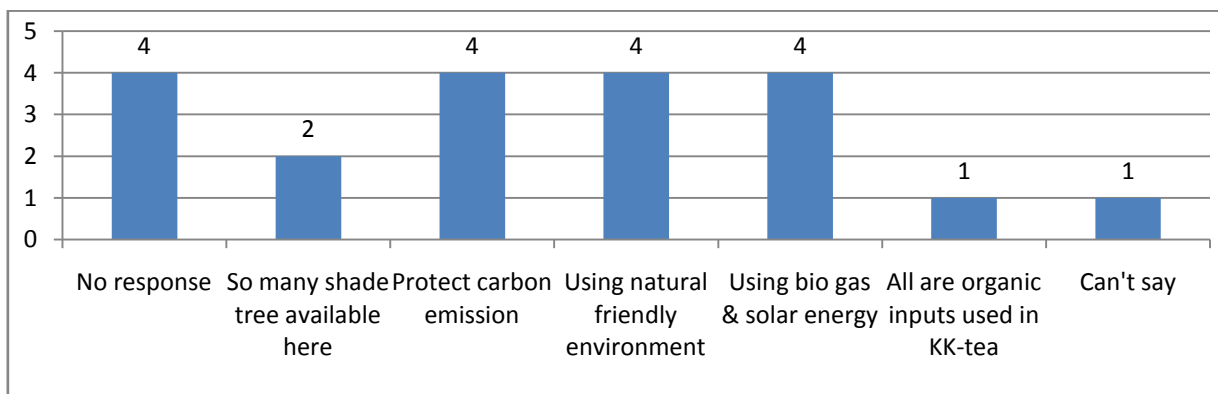


Figure 12 KKTE product diversity

Respondents from government officials and UP members 40% were mentioned that KK-Tea is well known to them. Another 20% reported that tea, sweets, rice and honey followed by tea, tulshi, mint, lemon tea, honey, ghee, sweets, (20%), high quality (15%) and better than market (10%)

3.8 Status of carbon emission through organic production

Organic production system is working as the store house of carbon by storing in its whole production systems.75% respondents were mentioned that KKTE is emitting less carbon (Fig 12) by using nature friendly inputs (20%), planting lot of tress (20%), using solar and bio-gas (20%) and reduce carbon emission (20%).

100% regular staff reported that KKTE is emitting less carbon by less irrigating (30%), using bio-gas and solar energy (20%), planting tress (20%) and planting of local species for carbon absorption.

According to government officials/UP members 75% respondents were mentioned that KKTE is emitting less carbon by protecting carbon emission (30%), planting trees (15%), less irrigating (15%), using organic inputs(10%) and using bio-gas and solar energy (5%).

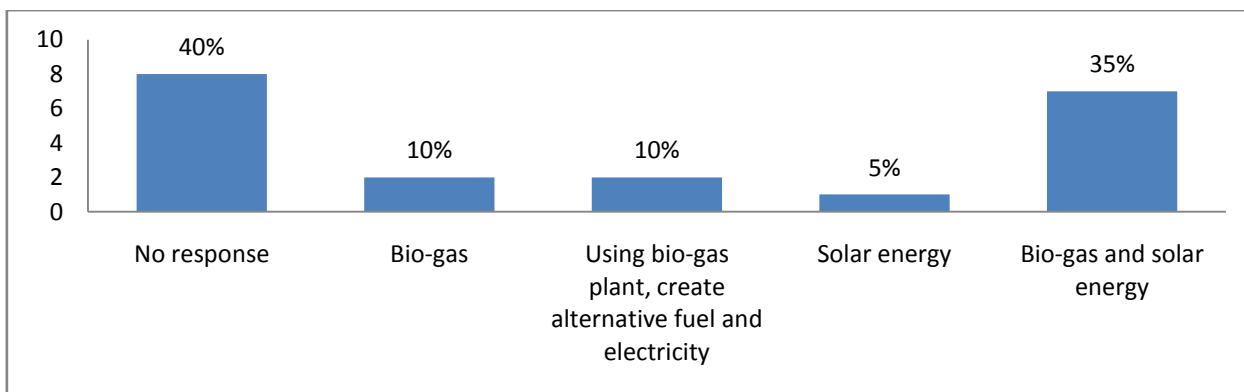


Figure 13 role of organic production in carbon sequestration

3.9 KKTE organic production, processing and energy use

The production systems were used little fossil fuels for processing and production.35% respondents were agreed that KKTE is using bio-gas and solar energy in reducing environmental hazards. On the other hand, 40% respondents were not able to respond in this aspect.40% regular staff reported that KKTE is using biogas and solar energy for power generation and 40% mentioned only bio-gas. 50% respondents from government officials/UP members were reported that KKTE is using biogas plant as alternative power energy and only 5% reported solar energy.

3.10 Role of KKTE in renewable energy and organic production

Organic production uses no or little fossil fuels for the production as compared to chemical production. Only 25% respondents were mentioned that KKTE is serving to community for renewable energy and farming of whom 15% told that KKTE is providing community based biogas plant .60% respondents from regular staff mentioned that KKTE is serving to community for renewable energy (Fig 20b) through community based bio-gas plant installation (30%) and lending money (10%). 30% government officials/UP members clearly mentioned that KKTE is supporting community people for renewable energy (Fig 20c) through using bio-gas energy (30%) and environmental conservation (10%).

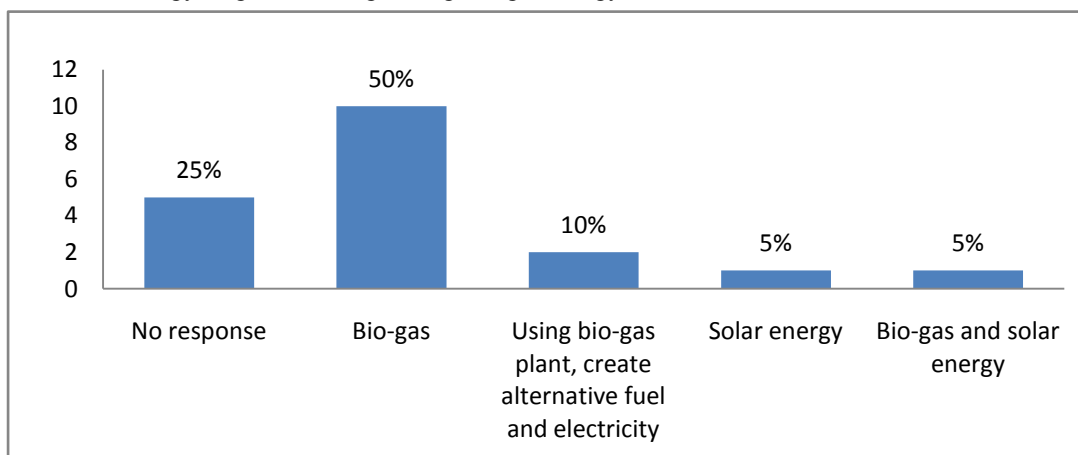


Figure 14 role of KKTE in renewable energy

3.11 Impacts of organic production to the environment

Lots of positive impacts are generated by organic cultivation. The few points on positive impacts of organic productions were mentioned in the box 1

BOX-1

- Protect soil from erosion process
- Increase soil fertility
- Gradually increase production
- Ensure proper uses of local inputs
- Reduce cultivation cost
- Reduce impacts on human health
- Less or no foot print on the earth
- Recycle the wastes and improve soil quality
- Purify the air maintaining sound air quality

3.12 Problems and risks of organic production

Several problems were recognized during the study including lack of organic seeds, lack of organic inputs and chemical contamination through neighboring fields are the common problems. No risks and environmental hazards were created by KKTE (through organic production) as because it's an organic garden and always evolve nature friendly activities for farming or organic productions. No poisonous materials were derived or disposed here and there for the creation of risks to the environment.

4. DISCUSSION

A noticeable result of all these interviews is expression of a broad spectrum of impacts, concerns and opinions that form the image of KKTE facilities in Panchagarh. Indeed, this array of often contradictory perceptions is what drove the initiation and completion of the entire study of ecological impacts of KKTE production.

Another common perception is that KKTE provides a market for organic quality produces. According to others, chemical farming (monocultures) is causing negative impacts on environment and soil fertility. Some of these contradictory perceptions can be resolved through this social impact study and the combined research results of the entire study on economic and ecological impacts of KKTE in Panchagarh. Opinions will remain unresolved because they reflect pervasive large-scale, long-term, social, economic, political, and ecological landscape. Thus, we are forced to ask and continually reiterate some of the following questions:

Organic growers work in harmony with nature by maintaining ecological balance. Organic growers are leaders in innovative research by inventing new option in reducing chemical pesticides or chemical compounds. For a significant fraction of consumers of the products, organic means quality, and attempts to improve it actually undermine, or 'conventionalise' the underlying production frameworks [5]. These insights give strong anchors (taste, freshness, appearance, healthiness and purity, environmental concerns) for development of protocols for further, more detailed examination of quality and safety issues in the new round In order to understand these needs and to find out how to translate different conceptions of quality attributes and food safety into practice, it is necessary to explore quality standards much more in depth.

The need also emerges to solve existing gaps among different actors in the organic food chain and to determine which of these aspects. like most of the studies inquiring on food quality [6] [7] [8] [9] [10] indicate out that quality dimensions and considerations are among the most important aspects in any food purchase. However, consumers usually connect it to health, and/or to safety, but not to an actual food quality perception can be fulfilled in a profitable way [2].

Safety of food is very important when shopping for organic products, whatever the shopping outlet [1]. Rejecting the idea that all food in supermarkets is safe [10], they turn to organic and local shops for their organic purchases. Organic products are accepted as long as they "taste good" and are often not recognized as such. In Northern countries organic food is generally accepted as having a "genuine taste" and a better "texture" [1] However, there is still little scientific evidence concerning the actual superiority of organic products with respect to the conventional ones, at least for

occasional consumers[11] [12]. As per respondent's opinion, they need set standard organic policy and appropriate certifying agency for annual inspection for maintaining quality of organics and safer uses of produces.

5. CONCLUSION AND RECOMMENDATIONS

The overall socio-economic condition of common people is changing rapid in Panchagarh following a faster development of the tea sector. Local tea growers elected body and officials concerned opined that setting up of more tea processing industries, competitive markets at the grass roots for tea leaves, supply of natural gas and resolving problems like power crisis could accelerate the production of tea. At the same time, hundreds of Panchagarh females, who lived in utter miseries due to abject poverty for years together, are now changing their fate and achieving self-reliance by earning wages as plucking workers in the dozens of tea gardens at the officially recognized third Tea Zone of the country. The growing tea sector in Panchagarh has ushered in a new hope for further enhancing the standard of socio-economic life and women empowerment. The female workers are yet to get their just wages from the garden-owners as the growing tea-farming sector in the region has been facing manifold problems including present unfair prices of the tea leaves for the tea farmers.

At the end of study we may conclude that organic food is safe, better taste, healthier and friendly environment. Peoples are becoming aware about organic foods in producing as well as consuming. Hopefully, the organic market will be expanded very soon with blooming demands. Like taste and flavour, the appearance of organic fresh foods may stand in contrast to foods from the supermarket chains. Larger size, uniformity and absence of blemishes are features that wholesalers and retailers can select for at wholesale markets. Organic farming supports biodiversity by (1) uses no or fewer chemical pesticides, (2) using less inorganic fertilizers, (3) by adopting friendly habitats management and (4) mixing arable and farm animals farming. After completion of the study the following recommendations were made to popularize and extension of organic cultivation in minimizing environmental degradation.

- Make people aware on the impacts of organic production to the environment
- Make provision to teach organic farming in the school, college and universities for greater extension
- Arrange organic food fair to disseminate the tale of organic and environment
- Organize Farmer's field day on organic production and exhibit their organic produces
- Need more research on organic production and climate change
- Government should take care of organic production through appropriate policy support and rewarding for organic production
- Adhere advocacy campaign on organic production and utilization of organic produces

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