



Research Paper

Organic Vegetable Growing in Mkuranga District and Farmers knowledge on its Contribution to Health and Environment

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Abstract- Organic agriculture has great positive impacts to the environment. Likewise, human health has close connection with the state of the environment. Organic agriculture produces food that has less agricultural chemical residues and hence poses less threat to human health. Industrial revolution brought about environmental pollution which threatened human health and the environment. Organic farming which uses less external inputs is thought to be able to protect human health and his/her environment, however very small percent of the total cultivated land is under organic production to date. This paper presents the findings from the research carried out in Sotele and Kerekese villages, Mkuranga District in Coast Region, Tanzania, about the organic vegetable growing. Specifically, the paper explains about the farmers knowledge about the role of organic farming on human health and environment. An exploratory research design is among the methodology used in the study. Face to face interview, personal observation and Focus Group Discussions (FGDs) were the main data collection techniques adopted. A non-probability sampling technique (purposive) was used to obtain organic vegetable crops production groups namely, Jipe moyo, Mshikamano, Umoja ni nguvu and Ushirikiano women group. It was followed by simple random sampling technique whereby a sample of 32 farmers was selected for focus group discussion and 41 for interview. Two key informants from Mikocheni Agriculture Research Institute (MARI), District agricultural officer, ward executive officer and village leaders were also purposely selected for interview based on the type of farming system and the location of the activity. Results showed that organic farming has great role on environment and health to both user's and producers. These included, improvement of soil fertility, protection of useful micro-organisms and production of food free from chemical residue. Furthermore, farmers in Mkuranga district have knowledge about the advantages of organic farming products on health and environment, although, it was noted that they are limited to successful engage themselves in organic production due to the lack of organic farming inputs including, organic manure, pesticides and insecticides which could be used to improve soil nutrients and fight against pests and diseases. It is recommended in this paper that, for sustainable agricultural activities which are environmental friendly within Sotele and Kerekese villages as well as the country at large, the ministry concern should insist on organic farming knowledge to the farmers, improve agricultural extension service, infrastructure and technology.

Keywords: Mkuranga district, Organic Vegetable, Farmers knowledge, Health and Environment.

Introduction

Most cities in the world increasingly face serious environmental pollution that threatens efforts to improve the standard of living and worsen health conditions. In developing countries, environmental pollution is an important challenge to the public health. The problem is intensified by the rapid use of chemical fertilizers and pesticides on management of crops^[3]. After the Second World War, both in developed and, to some extent in

developing countries, agriculture became highly mechanized, specialized and dependent on Agro-chemicals. Such a growth in farming created some problems affecting the environment, food and farm-worker's safety^[7]. Mateka (2003) pointed out that, an increased use of chemicals has been intensified as a major health hazard, leading to conditions that spread serious diseases like eye infections, persistent skin diseases and respiratory track infections. These diseases stem from environmental problems such as

contaminated water, air and land pollution. The use of agro-chemicals in agricultural activities also affects micro-organisms which are very useful in soil formation through decomposition of organic matter. To overcome the side effect of agro-chemicals different farming systems have been subjected to discussions and research to discover alternatives to the highly intensified agricultural practices, in a view to create conditions for sustainable agriculture and development which herein consider environmental protection and health of the users/producers (ibid). One of the alternatives is organic farming.

In its simplistic form, organic farming may be defined as a kind of diversified agriculture, wherein crops and livestock are managed through use of integrated technologies with preference to depend on resources available either at farm or locally. It emphasizes more on optimising the yield potential of crops and livestock under a given set of farming conditions rather than maximization [6]. Organic agriculture requires a great awareness and understanding of biological and ecological processes and interactions, and a longer term approach to make the system work without depending on chemical remedies.

Regardless of the previous studies on organic farming such as those done by Conklin and Thompson, (1993) purposely to compare organic and conversion farming on yield and quality of crops and found that organic farming is very powerful in terms of yield and quality over conversional farming but, still more than 60 percent of Tanzania's population depend on agro-chemicals for crop production, including vegetables [1]. These chemicals are documented as one of the most common reasons for serious health problems and environmental degradation [7,10]. It is not well known if farmers in Tanzania have knowledge on the importance of organic farming to the environment and their health. Hence, the study described in this paper was done to find more facts about the contribution of organic agriculture on human health and environment with the aim of demonstrating the role of organic vegetable production to health and environment, specifically to identify the role of organic farming on health and environment and explore the extent to which small scale farmers had knowledge on advantages of organic farming in terms of the environment and consumer's/ producer's health. The research conducted was identified as being useful as it could bring to light the facts about the understanding of small scale vegetable farmers on the positive contribution of organic vegetable production to human health and environment, and ultimately help the Tanzanian vegetable growers to opt for organic principles in their vegetable production process.

Materials and Methods

Study area description: Mkuranga district was selected as the area under study due to its environmental conditions which support vegetable growth, and also has

many small scale farmers who practice organic vegetable production. The district is among the six districts in Coast Region. Others include, Kibaha, Kisarawe, Rufiji, Bagamoyo and Mafia. According to Tanzania National Census of 2002 Mkuranga district is bordered to the North

by Dar-es-Salaam, to the East by the Indian Ocean, to the South by Rufiji district, and to the East by Kisarawe district. The district administration structure is made up of 4 divisions, 15 wards and 101 villages.

Research Methods: The study used Exploratory Research Design. The exploratory research design was employed so as to describe the main purpose or goal for the study. Poor expansion of organic farming has been noted in many parts of developing countries including Tanzania. Therefore, the study used exploratory design as the means to identify the role of organic farming on health and environment and explore the extent to which small scale farmers had knowledge on advantages of organic farming in terms of the environment and consumer's/ producer's health. A non-probability (purposive) sampling technique was employed to select women groups involved in organic vegetable production in Sotele and Kerekese villages within the district. This included women found in the following groups, Jipemoyo group, Ushirikiano women group, Umoja ni Nguvu and Mshikamano group. These farmers were dealing with organic farming particularly, vegetable production. They had been in the production for more than a year. A sample of between 8 and 12 farmers was randomly drawn from each group for interviews and 8 farmers per group for Focus Group Discussions (FGDs) (Table 1). The composition of FGDs members were all women since the groups were made by women organic vegetable growers. Interview was also made with other key informants purposively selected from Mikochei Agriculture Research Institute (MARI), district agricultural officer from Mkuranga, executive officer from Kisiju ward and Sotele and Kerekese village chairpersons. They were selected based on the type of farming system and the location of the activity.

A total of 73 farmers were involved in the study, 32 for FGD and 41 for interview. In addition to that, 6 key informants were included in the interview. Since the study intended to get people's opinion with regard to the roles and knowledge on organic farming on environment and health, qualitative analysis of information was made. Tables were used to show how respondents responded to various questions and some relationships between variables.

Results and Discussion

Farmers' Knowledge on Organic Production in Mkuranga

Organic farming requires the use of natural fertilizers such as cow dung, chicken manure and composite manure as well as natural pesticides like neems, pepper and pawpaw leaves. This was mentioned during FGDs as well as by the 41 respondents interviewed. Through FGDs, farmers indicated to use these kinds of organic inputs to protect human being and manage their crops against diseases and

pests. They were also used as fertilizers. These results match to Mangala (2004), who argued that an organic input helps to protect other living organisms which are very beneficial to environment. For example, there are soil micro organisms which decompose organic matters. Usually, organic matter

adds nutrients to the soil and hence increases productivity. There are some bacteria like nitrobacteria which convert atmospheric nitrogen into nitrates. This also adds fertility to the soil. Furthermore, there are pollinators like bees which

facilitate the whole process of reproduction as they are able to transfer pollen grains from one plant to another. These are further protected by the use of organic farming methods in crop production.

Table 1: Number of Respondents Selected for the Study (N=73)

Group Names	Total Number of Group Members	Respondents for Interview	Respondents for FGD
Jipe Moyo	31	12	8
Mshikamano	30	12	8
Umoja ni Nguvu	25	8	8
Ushirikiano Women group	20	8	8
Total	106	41	32

Table 2: Knowledge about Uses of Organic Fertilizers (N=41)

Uses of organic fertilizers	Frequency	Percent
Don't know	6	14.6
Knowledgeable	35	85.4
Total	41	100.0

Tables 2 indicates that 85.4% respondents understood that organic farming require the use of organic fertilizers such as cow dung, chicken manure and composite manure and 14.6% respondents do not have knowledge about the requirements of organic farming in terms of fertilizers.

On the other hand, Table 3 shows that 82.9% of respondents know that organic farming requires natural pesticides like neems, pepper and pawpaw leaves while 17.1% of respondents they have no knowledge about the required pesticides required for organic farming. However, through direct observations, it was noted that there were no enough sources of organic pesticides, insecticides and fertilizers regardless of having great knowledge on the inputs required for organic farming by the majority of respondents.

Table 3: Knowledge about Uses of Organic pesticides (N=41)

Uses of organic pesticides	Percent
Not knowledgeable	17.1
Knowledgeable	82.9
Total	100.0

Consumers' attitude on organic farming

The respondents were asked to give their opinions on the advantages of organic farming to environmental conservation and health of the people. Results showed that majority of farmers knew the advantages of organic farming on their health and environment in general. Table 4 showed that about 39% respondents do not know whether there were advantages of organic farming in their health and the environment while about 61% respondents were aware of the advantages of organic farming in the environment and their health.

Table 4: Advantages of Organic Farming (N=41)

Advantages of organic Farming	Percent
No advantages of organic Farming to environment and health	39.0
There are advantages of organic Farming to environment and health	61.0
Total	100.0

Tarkiainen and Sundqvist (2005) in their study on the attitudes of consumers in buying organic food founded people to have positive attitudes and interest in organically produced food. However, the proportion of consumers who purchase organic food regularly was reported to be low due to the insufficient knowledge and awareness on organic produce (ibid). Lack of organic products is clearly not under consumer control (ibid). The availability of organic products to consumers is in the hands of the supply chains. Furthermore, Tarkiainen and Sundqvist (2005) argue that production of organic food is a moral decision reflecting collective utility of environmental well being and to some form of individual well being.

In Finland, consumers had positive attitudes and beliefs concerning organic products (ibid). This has also been observed in some sales of organic food, which have risen considerably over recent years. In 2001, the global sales of organic foods and drinks reached around US \$ 19 billion, representing a US \$ 3 billion increase from previous years^[11]. Furthermore, Lockie *et al.*, (2002) and Lea and Worsley (2006), found that the consumers in Australia believed organic food to be healthier, tasty and environmental friendly than conventional food. They agreed that organic food had more vitamins and minerals than conventional food. However, unavailability of the products was the main barrier to the purchasing of organic food^[5].

Organic farming ensures food security^[6]. This is because in traditional rain fed agriculture (with low external inputs) organic farming has shown the potentials to increase yields. For example, under drought conditions, crops under organic farming produce significantly and sustainably higher yields than comparable crops under conventional farming system, often out-yielding conventional crops by 70

– 90 per cent. Apart from that organic systems have less long-term yield variability than conventional system (ibid).

Challenges facing Organic vegetable production in Mkuranga district

Developing countries have advantages and challenges in organic food production^[9]. First, low-input traditional systems are still a major part of the countries agriculture. Contrary to the developed nations, organic farming practices can help the farmers to increase productivity and protect natural resources. Most developing countries like Tanzania have small domestic markets. The main challenge they face is not having the domestic markets but having proper production practice of organic product that will ensure availability of the products to meet consumer satisfactions^[12].

Regardless of the advantages of organic farming in Tanzania (Table 4) the expansion of organic farming was hampered by lack of the initial capital, enough water for irrigation especially during the dry seasons, improved seeds, enough natural fertilizers and pesticides, enough working facilities like water cane, hoe and rake, availability of agriculture extension officers and presence of serious pests and diseases (Table 5). This implies that organic vegetable production at Sotele and Kerekese villages would be sustained only if the challenges were solved. Furthermore, other factors like poor infrastructure and lack of government support also affect the expansion of organic farming.

Through FGDs technique respondents pointed out that they always face pests like birds, monkeys, mice, grasshoppers, caterpillars, termites as well as diseases like fungal and powdery mildew. These diseases and pests affect crops. The methods employed for controlling those pests and diseases include: setting up traps, nets and guns, botanical chemicals such as papaya, neems leaves and tagetes for vegetables, and uprooting/cutting of the affected crops/branches for crops like cashew nuts and coconuts

Table 5: Challenges of organic vegetable production (N=41)

Challenges	Number of Respondents (multiple responses)	Percent
Lack of necessary working facilities	26	63.4
Water problem	32	78.0
Lack of capital	22	53.7
Problem of pest and diseases	27	65.9
Lack of agricultural extension officers	14	34.1
Lack of pesticides and insecticides	17	41.5
Lack of fertilizers	16	39.0
Lack of improved seeds	15	36.6
Communication problem	10	24.4
Lack of knowledge about organic farming	8	19.5
Base of %	41	100

Conclusion

Results showed that organic farming has great role on environment and health to both user's and producers. Furthermore, farmers in Mkuranga district have knowledge about the advantages of organic farming products on health and environment. Regardless of the roles and advantages of organic farming, it was noted that farmers are limited to successful engage themselves in organic production due to the lack of organic farming inputs including, organic manure, pesticides and insecticides which could be used to improve soil nutrients and fighting against pests and diseases. Hence, recommended that, for sustainable agricultural activities which are environmentally friendly within Sotele and Kerekese villages as well as the country at large, the ministry concern should insist on organic farming knowledge to the farmer, should improve agricultural extension service, infrastructure and technology. Apart from that, consumers of organic products must be aware and ready to pay extra coins for organic products to encourage the organic growers who have sacrificed the quantity for quality. Meaning that, there are less organic products per unit area as compared to conventional crops or animals. Diversification of organic production is important in order to meet the needs of organic inputs like organic manure and pesticides. Anyone who grows organic plants could have also animals around to provide manure. In this way the nutrients could be recycled within the same garden. Furthermore, Tanzania must include organic production in its "Kilimo Kwanza" literally meaning "Giving agriculture the first priority". By so doing, it can help to overcome the challenges facing organic production in Tanzania. Organic products selling centers must be strongly publicized and organic products be labeled in order to help consumers to know where to find the products and also to make a choice when they go for shopping. This practice can help to expand markets for organic products.

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