

ASSESSING LOCAL PRACTICES OF ORGANIC VEGETABLE PRODUCTION IN BHADAURE TAMAGI, KASKI, NEPAL

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ABSTRACT

This study assessed local practices of organic vegetable production through two focus group discussions and a household survey with 66 randomly selected households of ward number 1 and 2 of Bhadaure Tamagi Village Development Committee, Kaski district of Nepal. The study found that most of the farmers were growing varieties of organic vegetables by using local practices for household consumption as well as for marketing mainly by using livestock manure, and organic biopesticides prepared locally. In addition, organic vegetable production in the area has helped to increase their income and contributed to strengthen traditional seed exchange practice, conservation of local seeds and agro biodiversity. In order to sustain current production trend and enhance marketing of organic vegetables, the study recommends targeted interventions of organic farming related to capacity building, technology support and market promotion of the produces.

Key words: *Local practices, marketing, production of organic vegetables, small holder farmers*

INTRODUCTION

Organic farming has been adopted and proved to achieve food security of the farmers through creating a balance between agro ecosystem and human health (Bhatta et al., 2008; Khanal, 2008; Pokhrel and Pant, 2009). It is therefore seen as an advantageous investment for the small holder farmers of Nepal (Sharma, 2004). Farmers in most areas have perceived organic farming practice in line with the existing values, past experiences and present needs of the farmers and market.

So, it was not difficult for them to convert inorganic vegetable farming to the organic one (Kafle, 2011). More over, organic farming offers resilience against adversities, especially climate change by enhancing adaptive capacity of farming community and to mitigate it (Dahal, 2011). Still there are farmers practicing organic farming regardless of enabling environment of organic farming. However, there is very little information available regarding the existing practices of organic production adopted by small holder farmers in Nepal. Hence, this study was carried out to i) assess farmers' socio-economic status, farming practices and production system adopted for organic vegetable farming; ii) analyze

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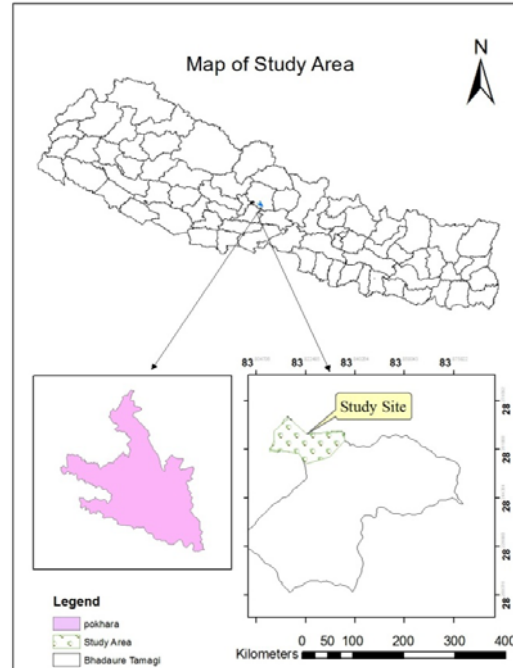
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the marketing system of organic vegetables adopted by community and market functionality.

METHODOLOGY

STUDY SITE

The following criteria were applied to select study site: 1) Community practicing organic vegetable production, 2) Ethnic community or marginalized community, 3) Periurban areas of Pokhara and 4) Marketing of vegetables to Pokhara. Accordingly, the study site was ward number 1 and 2 of Bhadaure Tamagi VDC of Kaski district, where farmers are doing organic vegetable production. Kaski district shares its boundary Lamjung in east, Syangja and Parbat districts in west, Manang and Myagdi in north and Tanahun in south (DADO, 2011). The study site has a temperate climate with altitude ranging from 1500 to 2000 meter above sea level. The study site is 9 km away from Naundanda of Bhupisherchan Highway and is connected by an agricultural road. Managing irrigation water for vegetable production is a major challenge in the study site.



Data Collection Methods

Preliminary survey

Pre-survey field visits were conducted to gather preliminary information regarding the organic practices for vegetable production, market chain, and existing condition of marketing and awareness of consumers of the sites. This information was used in preparing questionnaires and designing a sampling framework.

Key informant interview

It was used to gather information on the useful farming practices, local knowledge and innovations in managing soil nutrient and disease pests for organic production as well as for finding the farmers' constraints to produce organic vegetables. The local leaders, active

farmer, middle man, seller and the consumers were key informant for data collection during the survey (from preliminary survey to focus group discussion).

Focus group discussion (FGD)

Two Focus Group Discussions (FGD) were conducted in each study area after the field survey. The participants for each FGD were from 6-10. In FGD, both male and female farmers participated.

Household Survey

A representative sample (n=66 households) was randomly selected among the organic farming practicing farming households through the simple random sampling procedure. Sample size was determined by choosing 90% confidence level and assuming 50% variation in the population (Bartlett et al. 2001). Households were selected by using simple random sampling method with the help of computer random numbers from the purposively selected 11 organic vegetable producer groups of ward 1 and 2 of the VDC. Semi-structured questionnaires were administered to the sampled farmers being involved in organic production.

Household survey helped find out the local organic practices, skills and technologies, to know out the existing marketing situation of organic products and list out the awareness and willingness of organic consumers.

Case Studies

Two case studies were used to collect in-depth information of selected farmers including male and female among the households. Motivating factors for farmers to adopt organic vegetables production, existing marketing situation of organic vegetables and awareness level of retailers and consumers as well as the constraints of the market, market prices and market margin in the organic vegetables of pokhara. It was done after the household structured questionnaire survey.

Transect walk

Village transect walk was also done to have a direct observation of the area, to observe real field situation, to validate FGD findings, and to familiarize with the location.

Literature Review

The secondary information related to the study was collected from available literatures such as books, journal papers, proceedings and district profile, annual report, and national policy documents.

Data Analysis

Quantitative data collected were analyzed by using Statistical Package for Social Science (SPSS) version 16.0 and qualitative data were analyzed by analytical descriptions. Descriptive statistics was used to analyze data.

RESULTS AND DISCUSSION

SOCIO ECONOMIC STATUS OF RESPONDENTS

Among 66 randomly surveyed households, 60% households were Gurung, 20% were Brahman and 20% were Dalits. Among the respondents, 26% respondents were male and 74% were female. In terms of educational status, 49% respondents were able to simply read and write, 32% had secondary education, 7% had primary education, 6% had higher education and remaining 6% were illiterate.

Agriculture (89%) and pension (12%) were the main income sources for surveyed households being agriculture as a main occupation for most households (93%) followed by business (3%) and services (4%). This situation is similar to other organic farming locations, such as Kafle, 2011 also reported farming as the main occupation of a majority (89%) of the farmers in Phoolbari VDC of Chitwan.

All respondents have their own land i.e. inherited from their ancestors. They gave the area of their land in *hal* in Nepali. One *hal* is equivalent to 2 ropani. Therefore, land area has been converted to ropani from *hal*. Average land holding of the surveyed households is 13.30 ropani including khetland, bariland, home gardens, kharbari, and private forest. In addition, 40% households were found taking land (average land size being 2.7 ropani) on rent for growing crops. Around 81% households were found to cultivate their all land. Most of the farmers (61%) cultivate organic vegetables for household consumption and, if surplus, then they sell in the market for earning money.

Farming practices

Almost all respondents (99%) reported that they raise livestock. Among them, 91% households have raised buffalos and goats. The average number of buffalo owned per household was 2. Livestock manure (mainly of buffalo and goat) was the primary source of manure for organic vegetable production in the study area. Of the total respondents, 50% households reported to use improved farm yard manure (FYM), however, only few households (11%) have improved cattle shed for producing quality organic manure from FYM. And, 82% households reported that they were using cattle urine to prepare organic manures and pesticides (Table 1).

Table 1. Farming practices for organic vegetable production in study area

S.N.	Farming practices	Percentage	
		Yes	No
1.	Cattle shed improvement	11	89
2.	Urine collection	821.8	18
3.	Farm Yard Manure improvement	50	50

Source: Households Survey and Focus Group Discussion, 2012

The study found that 94% households were using biopesticides to manage insect and diseases in the organic vegetable production. Most of the households (90%) purchased biopesticides (such as, Tycostar, Neem F, Margosom) from market and only a few (8%) prepared biopesticides by themselves. They prepare liquid manure that contains a mixture of animal urine and pieces of neem (*Azadirachta indica*), banmara (*Eupatorium* spp.), chilli (*Capsicum annum*), bakaina (*Melia azadarach*), etc. while preparing local biopesticides. They were using hoeing and hand weeding methods to manage weeds.

Besides using biopesticides, farmers also reported of using alternatives to control insects and diseases. Among the options, mostly used measure was ash application in the fields (100%), followed by cattle urine (91%), hand picking (89%) and integrated cropping system (50%). Integrated cropping system included pest resistant crop cultivation and mixed cropping with aromatic plant species to manage pests such as integrating cole crops, root crops, legumes, tomatoes, brinjal, coriander, garlic, onion, chillies, potatoes, fruit trees and fodders. Integrated cropping system also reduces the need for procuring inputs and stimulates market-orientation among farmers for higher income (Singh et al. 2012). This type of organic farming practices offers resilience against adversities, especially climate change by enhancing an adaptive capacity of the farming community and to mitigate it (Dahal, 2009).

For soil nutrient improvement, majority of respondents found to be using traditional FYM (92%), improved compost (56%), liquid manure (56%), cattle urine (89%), and poultry manure (73%) while few respondents replied that they use green manure (2%) and goat manure (47%) for improving soil in their land (Table 2).

Table 2. Farming practices for soil nutrients improvement in study area

S.N.	Farming practices	Percentage	
		Yes	No
1.	Traditional FYM	92	8
2.	Improved compost	56	44
3.	Green manure	1	99
4.	Liquid manure	56	44

5	Cattle urine	89	11
6	Poultry manure	73	27
7	Goat manure	47	53

Source: Households survey, 2012

Organic vegetable growers collect local seeds and conserve them for organic vegetable production. Organic seeds have very good market not only in Nepal but also in India. A firm called Gorkha Seeds has been producing organic tomatoes at Nakhhu in Lalitpur district for last few years to cater to the domestic market as well as demand from India. Indian traders from Raxaul of India have demanded organic tomatoes and they have started supplying Shrijana tomatoes to India (Republica National Daily, 2010).

Market of organic vegetables forces to use local and hybrid seeds for organic vegetable production in the study site. 85% households of the study area were found using local and hybrid seeds. Farmers have been using different sources to get seeds for vegetable production in the study sites (Figure 1).

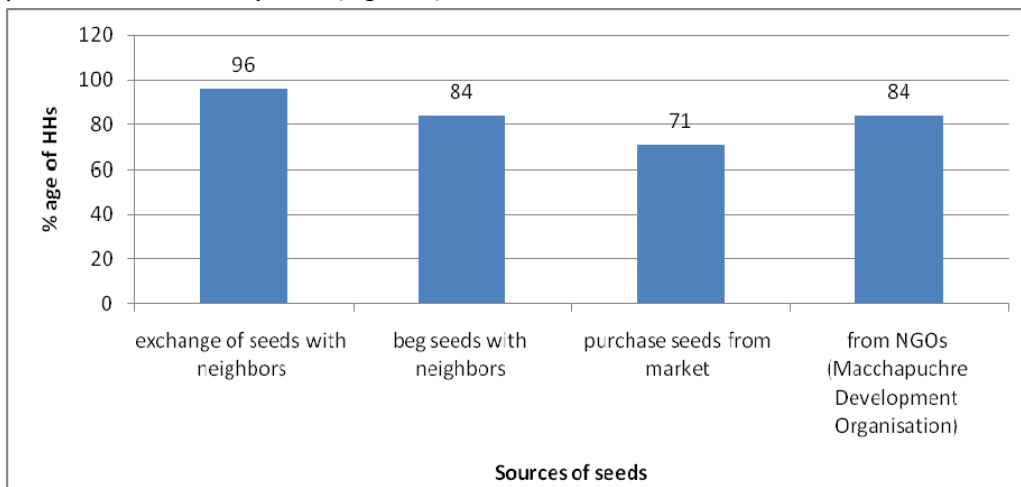


Figure .Different existing source of seeds (Source: household survey, 2012)

Majority of respondents (86%) felt that the availability of local seeds and seedlings has been increased with the adoption of organic farming. Majority of respondents (89%) also reported that there is an increase in the trend of using local seeds of vegetables such as cowpea (*Vigna radiata*), bean (*Phaseolus spp.*), potato (*Solanum tuberosum*), local tomato (*Lycopersicon esculentom*), pumpkin (*Cucurbita pepo* var *pepo*), broad leaf mustard. All respondents reported that organic vegetable production practices have increased crop production and species diversity in the study area. Singh et al. (2012) also found that organic vegetable practices enhanced species diversity and crop production.

PRODUCTION SYSTEM FOR ORGANIC VEGETABLE FARMING

Respondents grew 22 types of vegetables in the study area. The total vegetable harvested in a year was found to be 37, 126 kg/year (Table 3).

Table 3. Production of organic vegetables in study area

S.N.	Name of crops	Botanical Name	Total Production (Kg)
1.	Carrot	<i>Daucus carota</i> L. subsp. <i>sativus</i> (Hoffm.) Acreng	990.00
2.	Pumpkin	<i>Cucurbita pepo</i> L. var. <i>pepo</i>	990.00
3.	Eggplant	<i>Solanum melongena</i> L.	1320.00
4.	Ginger	<i>Zingiber officinale</i> Rosc.	1320.00
5.	Turmeric	<i>Curcuma domestica</i> Valetton	1320.00
6.	Coriander	<i>Coriandrum sativum</i> L.	1320.00
7.	Summer squash	<i>Cucurbita pepo</i> L. var. <i>condensa</i> Bailey	1320.00
8.	Radish	<i>Raphanus sativus</i> var. <i>radicula</i> L.	1452.00
9.	Cabbage	<i>Brassica oleracea</i> L. var. <i>capitata</i> L.	1650.00
10.	Brocauli	<i>Brassica oleracea</i> L. var. <i>italica</i> Plenck.	1650.00
11.	Garlic	<i>Allium sativum</i> L. var. <i>sativum</i>	1762.00
12.	Broadbeans	<i>Vicia faba</i> L.	1782.00
13.	Soyabean	<i>Glycine max</i> (L.) Merr.	1782.00
14.	Cucumber	<i>Cucumis sativus</i> L.	1848.00
15.	Cauliflower	<i>Brassica oleracea</i> L. var. <i>botrytis</i> L.	1980.00
16.	Beans	<i>Phaseolus vulgaris</i> L.	1980.00
17.	Onion	<i>Allium cepa</i> var. <i>cepa</i> L.	2310.00
18.	Hot chilli	<i>Capsicum annum</i> L. var. <i>minimum</i> Mill.	2310.00
19.	Broadleaf mustard	<i>Brassica rapa</i> L. subsp. <i>pekinensis</i> (Lour.) Olsson.	2640.00
20.	Tomato	<i>Lycopersicon esculentum</i> Mill.	2640.00
21.	Pea	<i>Pisum sativum</i> L.	2400
22.	Potato	<i>Solanum tuberosum</i> L.	3000

Source: Focus Group Discussion, 2012

Similarly, they grow paddy (*Oryza sativa*), maize (*Zea mays*), finger millet (*Eleusine coracana*), wheat (*Triticum aestivum*), upland paddy (Ghiaya, Juhari, Bageli, etc.) for household consumption by using local organic practices.

Respondents reported that food is sufficient for 8 months on an average in study site. However, it was found that farmers have in fact improved the level of food security after being introduced organic farming methods (Singh et al., 2012). China also showed similar results that improvement in food security in terms of nutrition and quality, optimization of

the agricultural structure and ensuring profit for both farmers and the company involved for organic vegetable production, processing and trading (Brandt, 2007).

MARKETING SYSTEM OF ORGANIC VEGETABLES

Farmers were producing organic vegetables using available local resources since several years. However, it has been 2 years since farmers were producing organic vegetables from marketing point of view. Out of total respondents, 60 %) households grew organic vegetables to sell while 40% of households grow for own consumption. Around 61% households ' sold surplus (after own consumption) organic products and 39% farmers sold the whole production to earn money. A majority of households (56%) sold organic vegetables to their to neighbor, 13% farmers to local shop, 4.5% farmers to local traders, and 51% farmers to traders from outside the village.

Organic farmers of Bhadaure VDC reported that they sold their organic vegetables such as cauliflower, cabbage, broccoli, radish, leafy vegetables, knol khol, coriander, potato, carrot, hot chilli, pea, cowpea, tomato, beans etc to "The Bazaar." The Bazaar is one of the working business house that facilitate marketing of organic vegetables from farmers to the consumers through its market outlets located in Pokhara city. The bazaar also supplies organic products to Shree Complex of Pokhara city. The organic vegetable growers of the other districts have market place in the Kathmandu valley for the diverse products ranging vegetables like lettuce, spinach, turnip, carrot, cabbage, tomato and leek are the major ones (Aryal et al., 2009).

The marketing channels of organic vegetables in Bhadaure Tamagi is (i) production in farmers field (ii) collection center (iii) display at market outlets and (iii) ultimately to consumers. Similar type of marketing channels of organic products was reported from Kathmandu valley (Aryal, 2008). In the study site, generally, farmers take their organic vegetables in a collection center (Deurali) where traders from Pokhara city can buy it to take them to the consumers. In addition, farmers directly sell their organic vegetables to neighbors, local shops and local traders in the villages apart from "The Bazaar"

CONCLUSION

Farmers in the study are using local manures and biopesticides to produce organic vegetables Organic vegetable production has increased by using local available resources for making organic manures, FYM, improvement of cattle shed, and using of cattle urine. These are the main practices for organic vegetable production in the study site. FYM and cattle urine are used for soil management; whereas cattle urine collection, use of ash, and integrated farming practices were targeted for pest management. Organic vegetable production trend is increasing in the study area over the time. The peoples' perception at local level indicates that 100% respondent of the Bhadaure Tamagi V.D.C has experienced

change in organic vegetable production and that too increasing in the growing vegetables for home consumption as well as the market purpose. Hence, organic farming can attract periurban small holder farmers and contribute to improve their livelihoods and build their resilience.

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