



## Organic Farming and its Prospects in Peri-urban Area of Pokhara, Nepal

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### Abstract

This paper examines the importance of organic agriculture as a way of improving sustainable livelihoods in the Himalayan region in Nepal – by conserving resources, producing quality food for home consumption and for earning additional income from the market. Taking the case of Pokhara region, it explores the opportunities and constraints in organic agriculture. It reveals that despite high demand of organic food products in Pokhara, especially in tourist area, the supply has not been adequate due to various constraints like fragmented production and availability of guaranteed and reliable quality and marketable quantity. The paper also reveals that there had been some limited and fragmented approach to improve organic agriculture in the past. But, due to the lack of a watershed approach in making the whole watershed organic farming area, it was hard for individual farmers to maintain all requirements of organic production. The paper argues that some of the present constraints like fragmented production and unavailability of marketable size of production would be resolved if whole watershed approach is taken into account. Furthermore, linking agro-tourism with organic farming would increase the income of farmers, which would make farming attractive for the youth. This again requires a watershed approach in declaring some bioregions as organic, which would help in facilitating organic-farming movement.

**Key words:** Bio-regions, conservation economy, organic farming, soil and biomass, sustainable livelihood, watershed

## INTRODUCTION

While much discussion has centered on improving livelihoods, there is less concern in Nepal to explore potentials and practices for sustainable livelihoods through organic or sustainable farming. Organic farming<sup>1</sup>, which has been developed within a rubric of natural capital and conservation economy, is one of the forms of sustainable agriculture. It is a combination of best practices at the household, community and bioregion levels that increase productivity while at the same time nurture bio-

cultural diversity. Such practices have demonstrated results in increasing biomass and other sources of natural capital (Pretty 2006; Stone and Barlow 2005). However, in many instances in Nepal, organic farming has been promoted more at the household level, and in very few cases, at the community level. This study has shown that unless organic farming is taken at the household, community and bio regional level, its benefits are less visible and less sustainable. Moreover, it is difficult to produce pure organic foods if the organic farming practices are not taken at the bio regional scale. Similarly, there are many advantages and complementarities among the households and communities if organic farming is taken at this scale.

1 Here organic farming, ecological farming, agro-ecological farming and sustainable farming or agriculture is taken synonymously (see also [www.conservationeconomy.net](http://www.conservationeconomy.net)). However, a discussion is also made in this document on the definitional aspects of organic farming. Similarly, here chemical agriculture, industrial agriculture and green revolution are taken synonymously.

One of the reasons why organic farming is sustainable is because it enhances natural capital through improved soil vitality, high soil fertility, less land degradation, maintaining local bio-diversity, good stock of forest managed sustainably, restored watersheds, wetlands, and pastures and production and use of clean energy. The enhanced level of natural capital and conservation economy helps increase household income and meaningful employment for its members without the need to migrate to other countries or to the cities or abandoning the option of agro-ecological livelihoods<sup>2</sup>. At present, more and more people are leaving the country or rural areas in search for employment and income. Even though migration for outside employment is not necessarily due to push factors, decline in food production, risks of food insecurity and need to earn more income to meet the high expenses for livelihood at home are some of the drivers of out-migration. The present chemical agriculture that has been promoted in the name of increasing production has adverse impact on the health of people and this has required more expenses in the health system. There are increased level of risks involved in green revolution techniques. Genetic engineering techniques have also threatened public health. There are no studies to demonstrate how far chemical farming has increased health risks are in Nepal. But, observations and experiences clearly show that incidences of diseases connected to the use of chemicals like insecticides, pesticides and other potent chemicals have increased in areas where

these chemicals have been used<sup>3</sup>. Moreover, this system of farming requires inputs from outside, as Nepal does not produce much of these chemicals. Farmers are not getting remunerative prices for their produce, but are forced to pay more for fertilizers and pesticides. As a result, some portion of the income would certainly go out of the hand of the farmer. Considering this Vandana Shiva says that poverty in rural areas is increasing. She called for adoption of ecological agriculture, which is not only productive but also a solution to poverty (2009). She argued “what the people need the most is good and clean food at affordable prices” (Shiva 2009).

The traditional organic farming is till predominant in Nepal thanks to the inaccessibility due to lack of transport infrastructures. Even though some of the principles adopted in this system like integration of different components of farming, maintaining diversity, using home-made organic insecticides and manures, using the open-pollinated seeds, mixing of different crops and enterprises, and recycling of the waste are useful for

3 Author of this article had done a research in Phanchkhal area in the late 1990 and interacted with many farmers, who had clearly observed and experienced the health risks arising from the intensive use of insecticides and pesticides and chemical fertilizers. They would say “well I have earned some money, but at the cost of my family members and their health”. The incidents of human diseases like cancer had grown there. It is clear that people know nowadays about these diseases, which they did not know past. But, nowadays, they have noticed the increased level of deaths especially among those who work in the farm. Accordingly, there had been more death of women in that area. This could be a subject of a research. But, the link between chemical agriculture and health problems, especially of new kind, has already been established.

2 [www.conservationeconomy.net](http://www.conservationeconomy.net)

improving natural capital, not much research has been done to improve the production in organic agriculture. On the other hand, inorganic farming has been receiving almost all research funds and support from the governments and development partners. There is also a great deal of controversy as to whether organic farming produces more or less as compared to inorganic chemical agriculture. Here the first thing is to understand the meaning of production and productivity. If the production of overall biomass is considered as an indicator, certainly organic farming is more productive than chemical farming (Shiva 2009). Moreover, considering the energy efficiency, the traditional farming and organic farming are more efficient in producing more energy from less input of energy<sup>4</sup>. Those who support chemical agriculture do not give due regard to other production or the contribution to natural capital except for the foodgrain or the commodity that human directly consume. Even in this regard, i.e., production of the commodity that human directly consume like grain, meat, leaves, and fruits, organic farming could be more productive if done properly. Moreover, production and yield rates in the ecological and organic farming system could be as high as energy intensive industrial food system (Uphoff 2005; Toledo 1998). This requires agroecological restoration along with creation of watersheds and local foodsheds, which minimizes water use for food production while recharging the water supply in the environment.

The mainstream development industry in Nepal is promoting chemical-intensive

farming under the broad approach of 'industrial agriculture', which emphasizes use of chemicals and machinery. This farming technique has many disadvantages in terms of losing the capacity of biophysical system to cope with various risks and uncertainties. Reduction of bio-diversity and interdependence among the species, pollution, soil erosion and degradation, and high-energy input from fossil fuel make the chemical farming not resilient to changes in the system. As a result, the impact of drought, diseases and pest or even climate change could be devastating in chemical farming. Taking the case of USA where industrial agriculture is common, 19 per cent of fossil fuel was used in agriculture in 2008. Current food system is also adversely affecting the health and healthcare system, which consumes 16 per cent of the US national budget. Four of the top 10 killers in the US today are chronic diseases linked to diet: heart disease, stroke, type 2 diabetes and cancer (Pollan 2008a, 2008b, 2009). These four and all-top ten diseases are connected to modern American diet that is heavy in salt, sugar and fat. Thus transitioning towards organic and sustainable food systems would avert us from this downward spiral. Nepal is also following this model of farming as well as the food system. As a result, the problems seen in developed countries are also beginning to appear in Nepal. For example, people living in urban and peri-urban areas are increasingly suffering from heart diseases, cancer and obesity, diabetes and the like. On the other hand, it is also true that there are widespread incidences of hunger and undernourishment due to lack of access to food. So increase in food production is a must but choices have to be made in favor of sustainable practices as well as localised and fair distribution of food to those who need it.

4 [http://www.alternet.org/story/85433/vandana\\_shiva%3A\\_why\\_we\\_face\\_both\\_food\\_and\\_water\\_crises](http://www.alternet.org/story/85433/vandana_shiva%3A_why_we_face_both_food_and_water_crises)

Climate change has become of the challenges for increasing food. The mainstream attention to climate change in recent years falls short of connecting it to agro-ecological system, which is the mainstay of people's livelihoods in regions like the Himalayas (Chhetri 2009). Thus current climate change strategies fail to offer long-term and sustainable solutions that are conducive to people who live in these fragile ecosystems and regions. One of the reasons why chemical agriculture cannot cope with risks like climate change is because it destroys the bio-diversity. As of now, industrial agriculture tops the list as destroyer of habitat for species (endangered as well as at risk) with 38 per cent of its share in the US<sup>5</sup>); it is followed by commercial development (35 percent), grazing (22 per cent), dams (17 percent) and logging (12 percent). Instead, a biologically diverse agro-ecosystem increases resilience and reduces vulnerability to climate change. There are also abundant ways individuals and groups are reconnecting food-systems with ecosystems and enhancing biodiversity through agro-ecology, permaculture and farming in nature's image (Posey 1999; Jackson and Jackson 2002; Pretty 2005, 2009; Pemmental 2005; Tobias and Morrison 2009). On the other hand, the current industrial and globalized agriculture contributes to, and is vulnerable to, climate change. As it is practiced today, industrial agriculture contributes up to 37 per cent of the greenhouse gases (ICFFA 2008). In that sense, it is true that industrial agriculture, ranching or monoculture, is the source of the problem, and not a solution, to climate change.

5 New York Times, Feb 11, 2009.

In the face of water shortages and irregular water supply in the wake of climate change, the organic farming could be a solution to meet this challenge. For example, in the industrial agriculture, it takes an average of 1000 litres of water to produce 1 kg of cereal grain and 43,000 litres of water for 1kg of beef<sup>6</sup>. It is about ten times more water in industrial chemical agriculture as compared to traditional organic farming. Water is clearly a limiting factor and will become more of a crisis as climate change melts our glaciers, dries up our springs, and leaves more and more areas water scarce. It's also a solution to the conflicts all around us. These conflicts have occurred at grassroots level as well as at regional and national levels.

The multi-functional, bio-diverse and localized yet diversified food system in organic farming mean there is less release of green houses gases. This will reduce the many weaknesses of the industrial food system like high food mile and high energy backpack food; chemical and biological pollution of soil, air and water; soil erosion and degradation; water scarcity; and emissions of green house gases. It is estimated that ecological organic farming could reduce up to 25 per cent emissions of green house gases (ICFFA 2008: 12).

Organic farming or the sustainable agriculture is not only about the production of clean and safe food, but also a way of empowering and invigorating community cohesion and organization. Local organizations for promoting sustainable agro-ecosystem, which will encompass above principles, are strengthened. These organizations

6 New York Times, Feb 11, 2009

are of the people struggling to improving livelihoods and, at the same time, following the sustainable agro-ecological system and time-tested indigenous practices. These organizations are to be strengthened in a way that they become able to reclaim autonomous food systems and thereby enhancing their food sovereignty and maintain their diverse forms, functions and structures. Mutual support and co-operation and local democracy will be strengthened through these organizations. It is seen that disempowering of the local communities by the state bureaucracies (eg. Scott 1998) have led to a situation where rural communities are not in charge of their local food system. This resulted in the erosion of local food system (including food culture) and mutual help, and greater penetration of corporate agriculture. Corporate agriculture has been instrumental in destroying the local ecological system and in bringing misery to farmers in developing countries. Local organizations are crucial for the adaptive and sustainable management of food producing environments as they have intimate knowledge of their environment (Pimbert 2009; Senge et al. 2008; Leopold 1991; Learning Research Network 1991). They are well placed to monitor and respond adaptively to environmental/climate change (i.e., ecological system) and to human society (social system), initiate collective action by bringing all related stakeholders at one platform (Berkes and Folke 1998). This is more so in the mountain areas, where ecosystems are characterized by inaccessibility, fragility, marginality, diversity and niche. Empowered local organizations will also be able to resist the system that is harmful to them. Federation of these organizations

of producers at different levels as well of consumers will empower both and will bring them together in direct contact.

It is true that communities are not homogeneous and there is wide disparity in ownership and access to resources and in the participation in discursive process. Therefore, there is also need to address inequality in access to resources. But there are plenty of common properties and government lands where poor people can practice sustainable farming practices.

### **ORGANIC FARMING: DELINKING LOCAL AND CORPORATE AGRICULTURE**

The biggest threat to agriculture in developing countries comes from WTO's provisions and growing corporatization. A few multinational companies are controlling the genetic resources in the form of seeds and chemicals that are used in the production of crops. Similarly, they are also controlling the processing and distribution of food. Shiva considers that biggest monopoly in our time is when agribusiness went into the oil economy (2006). They are not going to allow governments to move towards self-sustaining organic farming rapidly. Patenting of seeds and genetically engineering of crops has almost brought the agriculture of the world in the grips of the multinational companies. They have so far only genetically engineered four crops on any significant scale: cotton, soy, rice and canola.

The agriculture that helps to build local food system is considered as antidote to corporatization and globalization of food. Organic agriculture, which builds local food system and local economy, is just an

antidote to corporate agriculture. Because of the corporate and monopolistic system of the few multinational companies, the free gifts of nature that are needed for people's survival have also been commercialized. For example, water, seeds and traditional knowledge are free gifts of nature and our ancestors. But the patenting system has destroyed these free gifts. Organic farming is also important to keep these things under the control of local people. For example, open-pollinated seeds will be there until organic farming is practiced.

Even though organic agriculture is about production of food, it is also responsible

to teach urban-dwellers and others who do not produce food on the issue of how the food is produced and enhancing their knowledge of 'how the food comes to their table'. They also need to be convinced about the importance of safe and natural food. If the urban-dwellers commit themselves to eating only food that is genuinely free of patents, GMO's, pesticides and toxins, and free of corporate control, organic farming is successful and it will also help towards increasing local food production, but also in saving water consumption as organic food production requires less water and preventing various diseases caused by chemicals in the food.

#### The benefits of organic agriculture

Economic benefits	Environmental benefits
<ul style="list-style-type: none"><li>• Lower cost of production &amp; substantial savings</li><li>• Yield maintained or increased</li><li>• Higher household income</li><li>• Lower debt</li><li>• Higher cropping intensity</li><li>• Lower risk perception &amp; higher investment in agriculture</li><li>• Business innovation &amp; new opportunities</li></ul>	<ul style="list-style-type: none"><li>• Better soil, land and water conservation</li><li>• Conservation of agro-biodiversity</li><li>• Fewer pesticide related health problems</li><li>• Smaller carbon footprint as a result of reduced use &amp; production of inorganic fertilizers</li></ul>

## PHILOSOPHY OF ORGANIC FARMING

Organic farming is not only about food production; it is all about nurturing the nature and human body and developing a symbiosis. In this symbiosis, people are at peace with nature. Shiva argues that an agriculture that is at peace with nature is needed so that farmers are in peace and doesn't push them into the violence with nature. The violence and suicides that are seen in chemical agriculture are

not possible in organic farming. Second important philosophy is the celebration of diversity. Biodiverse systems produce more nutrition per acre than the most intensive industrial systems and also have a higher land-equivalent ratio. That means one can grow much more on the same piece of land because of symbiotic relationships between the plants. Third important philosophy is the importance of keeping in the commons that which belongs to the commons, like biodiversity and knowledge. As Shiva (2009) says "the

dominant market philosophy today is based on competition, but to my mind, the only things that sustain themselves in the long term are solidarity economies - economies based on mutual trust, on give and take.”

For organic agriculture, one has to move beyond what is called ‘green revolution’ - considered as panacea for solving global hunger. Chemical fertilizers, the new seeds, and pesticides don’t come free and are a major reason for indebtedness, which itself leads to loss of farms, land, and entitlement to food, and to suicides of many farmers, which is happening in many parts of the world, especially India (see Adhikari 2014). This trend of suicide of farmers is still continuing in India, especially in Maharashtra and in Madhya Pradesh. Moreover, the costs of these inputs are increasing and farmers sometimes are not able to pay the price for these inputs because of market crash leading to low price for their produce. Chemical fertilizers are fossil fuel-based and a major contributor of nitrogen oxide as a greenhouse gas. They also make the soil much more vulnerable to the smallest drought or flood.

The basic propaganda of corporate agriculture - green revolution is also part of this - is that the technology they promote is vital for increasing food production and thus to solve the hunger and malnutrition problem. GMOs are also promoted exactly on the same ground. How far this is true is questionable because there is already enough food in the market to solve the hunger and food crisis. Moreover, increasing food production is not synonymous with increasing food security. For example, Amartya Sen claimed that large historic famines were not caused by decreases in food supply, but

by socioeconomic dynamics and a failure of public action. In this regard, dismissing organic farming on the ground that it is not relevant to solve food-security problem, as it does not yield much, is baseless.

Nepal’s agricultural policy also emphasizes the inorganic agriculture. APP that government prepared for 20 years (1995-2015) follows the green revolution model that was adopted in Punjab, India. It aims at increasing the fertilizer and pesticide use at the level of Punjab for better production and growth in the economy boosted by increased growth rate in agricultural sector. After APP was over, Nepal government brought another similar plan called ADS - Agriculture Development Strategy - for another 20 years starting from 2016. This plan takes the same approach to agricultural development in Nepal that APP took. ADS again emphasizes high energy input based inorganic agriculture like that in Punjab and Haryana, India. However, after 50 years in Punjab, things have changed. Shiva writes:

“What the Green Revolution basically did was push farmers into debt. It left the land desertified. It destroyed variety. Punjab used to grow 250 crop varieties. Today it grows monocultures of wheat and rice during two separate seasons and a monoculture of genetically engineered cotton. Punjab is one of the areas where we have large numbers of farm suicides. Twenty percent of the Punjab is now unfit for cultivation. Ten percent is water logged by putting too much water in intensive irrigation. Now this is precisely the package upon which the genetic engineering revolution has been built. The biotechnology industry calls it the second green revolution”<sup>7</sup>

<sup>7</sup> <http://www.globalresearch.ca/globalization-and-poverty/11540?print=1>

Furthermore Shiva (2009) considers that there are two systems – allopoetic and auto-poetic that deal with ecosystem. The auto-poetic system are self-renewed and self-organized and have capacity to adjust. The allopoetic system is that which is externally controlled. Organic farming is auto-poetic and green revolution or GMOs is allopoetic, and it cannot produce seed to regenerate and adapt to new climate. Nepali state, with the help of international donors and agencies, slowly pushing its ‘auto-poetic’ agricultural system to ‘allopoetic’ system. Its consequences have appeared in urban areas, which consumes foods coming from ‘allopoetic’ system and as a result health of people have deteriorated.

## ORGANIC FARMING IN NEPAL

Still more than 70% crop cultivation in Nepal is almost free from the use of chemical fertilizer and pesticide. This is based on the definition of organic farming by a conference organized by the government in 2006. It defines organic farming as ‘farming without using synthetic products and farming without damaging environment/human health/ecosystem’<sup>8</sup>. Similarly it considers organic products as the product which is produced without using chemical fertilizers and pesticides and, if needed, with the use of local bio-pesticides and bio-fertilizers.

This lends vast opportunity for promotion of organic products. The tenth plan states the following policy for organic agriculture:

<sup>8</sup> Proceedings of a First National Workshop on Organic Farming 12-14 June 2006 (Baishakh 28-30, 2063) Kirtipur, Kathmandu . Jointly Organized by Directorate of Agriculture Extension, Directorate of Vegetable Development, and District Agricultural Development Office, Kathmandu Published by Directorate of Agriculture Extension Hariharbhawan, Lalitpur

– Avoid the use of GMO & LMO in organic areas. If at all they need to be used, then have a provision of pre-clearance system from concerned authority.

- Conserve and commercialize the indigenous commodities, medicinal plants and their cultivation (forests, tubers like gittha, bhyakur, kandamul, wild mushroom, and wild honey or bees - *bbir-mauri* - etc)
- Conserve soil and ground water sources and use water judiciously.
- Increase the use of renewable commodities.
- Improve coordination and connection between animal husbandry & organic agriculture.

Apart from this policy, government has not done much in organic agriculture. But a few NGOs and innovative farmers are engaged in organic farming. Some of the constraints<sup>9</sup> identified are: lack of organic matters availability; lack of recommended package of practices; high cost; no marketing net work; yield is low; lack of awareness/understanding; high certification cost; and, lack of national organic standard.

Even though the cost of production is considered high, it should be noted that the cost is generally high in chemical agriculture. For example, a research in India has shown that about 35 % of the cultivation cost in chemical agriculture has gone into fertilizer (21 %) and pesticide (14 %) and another 11 % on imported seeds (Kumar *et al.* 2009). This means 46 % of the total cost is used to buy things not produced locally. As a result, chemical

<sup>9</sup> As of footnote 7.

agriculture has been expensive. To meet the high cost of cultivation farmers have been under pressure to borrow. The estimated prevalence of indebtedness among farmer households in the study area was very high at 82 percent and, the average outstanding loan for farmers with small landholdings was more than twice the national average. The main purpose of these loans was to meet *current expenditure* in farming, which means that income from farming was insufficient to meet the associated expenditure. The cost of production in case of organic farming was \$ 180 per acre and \$ 280 in case of chemical agriculture. Similarly, saving was more in organic farming.

A major problem in farming and in converting the chemically polluted fields into organic fields is the use of heavy dose of pesticides and other chemicals. Even though pesticide or chemical use in Nepal's farming is less in general, it is extremely high in places where it is used. One of the most problematic locations in this regard is peri-urban area. Peri-urban area in Kathmandu, Pokhara and other major cities and towns produce vegetables by drenching the crops with pesticides and other chemicals. Especially in off-season crops, use of chemicals is very high. The higher prices for these types of vegetables give incentives to farmers to use more chemicals.

Since after the introduction of pesticides in Nepal, its use has increased rapidly throughout years for the purpose of improving crop yields, controlling and eradicating vector borne disease, pests, disease control in agriculture and forest crops. The commonly used pesticides are; Malathion, Chloropyriphos, Cypermethrin, Deltametrin,

Mancozeb, Methyl Parathion, Fenvelarate, Dichlorvos, Endosulfan, Chlorpyriphos + Cypermethrin, Dimethoate, Carbendazim, and Dithane. Import and formulation of pesticides have increased drastically in Nepal. For example, between 2006 and 2012, pesticide import/formulation increased from 128727.63 kg to 344585.7 kg of ingredients – more than double in six years time (CBS 2016: 68). This report also mentions that chemical fertilizer use has increased at the same time even though official data do not clearly reveal this, as import from private source is not accounted (ibid: 68). Another study revealed that, although pesticide use is still low (142 g a.i. per ha) in Nepal as compared to many other countries, a majority of the farmers are unaware of pesticide types, level of poisoning, safety precautions and potential hazards on health and environment (Sharma *et al.* 2012). According to the latest estimate, the annual import of pesticides in Nepal is about 211t a.i. with 29.19% insecticides, 61.38% fungicides, 7.43% herbicides and 2% others. This study reveals that Pesticidal misuse is being a serious concern mainly in the commercial pocket areas of agricultural production, where farmers are suffering from environmental pollution. Incidence of poisoning is also increasing because of intentional, incidental and occupational exposure. Toxic and environmentally persistent chemicals are being used as pesticides (Sharma *et al.* 2012).

## **POKHARA AND PRODUCTION OF FOOD IN THE PERI-URBAN AREAS**

Pokhara is one of the municipalities in Nepal, which has been growing rapidly. Its population growth rate has been about

7 percent per annum, which means that population doubles in every 8 years.

Urbanization in Pokhara has reduced the scope of farming within the urban area as more and more land has been converted to residential area. As a result, livelihood strategies have changed from primary production to trade and remittance. Industrial development is still in infancy even though attempts were made to develop industries since 1975 when an industrial estate was established. Pokhara was considered as a growth pole for the western development region, but as of now it has not been able to trigger economic growth in the region. The main reason for relatively better economic condition in Pokhara and its hinterland is the remittances. The second source of income is tourism. These two economic sectors will not be helpful for sustainable development unless local production is not increased and proper rural-urban linkages are developed for the flow of goods and commodities or service provision.

Pokhara's urbanization has influenced the farming system in its environs. For example, in some of the peri-urban area of this town, vegetable farming has grown to a great deal, but still a large part of vegetables and fruits come from India. The growing intensity of vegetable farming that is seen in some pocket area is supported by the heavy use of chemicals – fertilizers, pesticides and hormones. The later two inputs have seriously polluted the foodchain. There is considerable degree of environmental problem because of this. The influence of urban center is still not fully encouraging the farm production in the hinterland. It is not only that Pokhara is heavily dependent on India for fruits

and vegetables, even the milk production, which was sufficient in the past, has been insufficient. For example, the main dairy company in Pokhara called Sujal Dairy is getting only half of its requirement and it is bringing milk from India from November, 2010. The livelihood that urban area could spur in hinterland has not been significant in Pokhara's case.

A few pockets where intensive farming is done, especially for vegetable production, heavy chemical inputs have destroyed the health of the people and the environment. On the other hand, these inputs which come from outside are becoming expensive. This is obvious that the cost of production has increased, and will increase, in future if the same type of farming practices are followed. The increased use of imported seeds, especially hybrid seeds from countries like India and Japan and other developed countries, is another cause for concern. The present technology has thus increased production of vegetables to a certain extent, but at the same, has enhanced the risks to health and environment and a dependency on other countries. Therefore, this system may not be sustainable.

Considering the above problems, some farmers seem to realize the disadvantages of this new farming technology and trying to return to the traditional one by improvising to meet the present challenges. Tourists were also responsible to introduce the concept of organic farming. As early as 1980s, tourists from Europe, especially Germany, had advised a few restaurant-owners to develop their own organic garden and use its products in the restaurant. In addition, a few individuals having knowledge of the

adverse impact of modern development on environment had developed modern type of organic farming. There were some attempts to develop market linkage from organic farming to hotels. As the production was not in required volume, this linkage did not develop. Big hotels in Pokhara wanted a regular supply of such products and of assured quality. As this was not guaranteed, these hotels continue to get their supply from India.

In recent times, some attempts have been made to introduce organic farming in Pokhara. Until the early 1970s, all farming in Pokhara was organic<sup>10</sup>, which was called traditional. In this sense, there are two terms difficult to separate: organic and traditional. It is true that all traditional agricultures are organic, but not all 'organic' are traditional. The 'organic' can be modern in terms of use of new technology if not the use of chemicals. There is a thinking that all traditional farming is organic, but it is not true too. In this situation where traditional farming still remains, the word 'organic' has been spreading. It is not only I/NGOs but also hotels or restaurants and farmers themselves started trying to organic-related activities in and around Pokhara.

10 Since the mid 1970s, farmers in Pokhara (in other places too), were given freely a package consisting of chemicals, fertilizers and modern seeds in order for them to trial in their fields and get used to this system of farming. This introduction of modern technology in terms of seeds and chemicals was meant to discourage the traditional farming inputs for the sake of increasing the production. Then, an attitude of shunning the local seeds started. A distinction was made between 'traditional' and 'modern'. Anything traditional was not considered right for the time. Later on the practice of distributing free packages stopped and people were required those inputs in the market. This caused a speedy erosion of local seeds (see Adhikari 2014).

Word 'organic' is very new concept, which came from the 'western' countries. Accordingly, it is easy to convince the tourists and others about the quality of products by using the label 'organic'. So, this term 'organic' became common than the term 'traditional'. In Pokhara city, a local NGO, LI-BIRD (Local Initiatives for Biodiversity Research and Development) first started organic-related programs in 1995 so as to achieve sustainable agriculture system by preventing or improving biodiversity. Soon after, SADP Nepal (Sustainable Agriculture Development Program Nepal) and NPG (Nepal Permaculture Group) began to practice organic farming projects<sup>11</sup>. Aoki (2011) reveals that a person who knew the word first is a manager of restaurant, which was founded by German people 21 years ago (around 1988). They gave advice to the manager to grow vegetables without any chemical substances for their serving meals as well as how to manage a restaurant. This means that there are local people who had known the word 'organic' before I/NGOs started their own projects. Recently, much more tourists coming from economically developed countries have got interested in organic products, so the number of opportunities to hear the word is increasing in this area. In this way, local people first receive the information about 'organic' not only from foreign aid affairs or I/NGOs related to organic farming but also from foreign tourists. Then after, the term 'organic' became widespread through talking with family members or friends.

11 Aoki, Misa. 2011. Prospects and Challenges of 'Organic' in and around Pokhara (available in the internet).

## THE RESEARCH PROBLEM AND OBJECTIVES

Given that there is market and interest to develop sustainable farming, it is necessary that this opportunity be explored and constraints identified. It is obvious that a lot of farming cannot be in urban core areas (even though urban-farming is also gaining popularity and this is done organically), but it can be done in peri-urban areas and rural hinterlands. Moreover, there is some scope to introduce urban agriculture, especially in poorer sections of the city for social and economic benefits of the people living there. Because of tourism and urban households in Pokhara, there is scope for marketing of the surplus produce at the household level. Proper and effective linkages between producers and consumers have also not been made for the local produce. As a result, hotels depend largely on foreign produce like milk, egg, meat, vegetables and fruits. To this need, this study aimed to:

1. Study the existing situation of urban organic agriculture and the possibilities to expand it.
2. Examine the problems regarding farming in the hinterlands and mapping the sustainable farming and examine their problems.
3. Explore the possibility of linking tourism and sustainable agriculture through interaction with hotel and restaurants owners.
4. Prepare local practitioner, researchers and activists in sustainable farming through a process of mentoring.

This study was undertaken as a background-exploratory study for a large scale action-research at a later phase.

## THE RESEARCH METHODS

This was an exploratory research conducted in 2008, and qualitative information was gathered from farmers, their groups, and sales agents. After 2008, this region has been regularly visited and observed. After a brief literature review on urban agriculture and sustainable farming, study examined the best practices seen (2008-2016) in Pokhara and its hinterlands. Farming in a ward of the Pokhara municipality was examined in relation to the use of chemical inputs and its health and environmental hazards. The same kind of exploratory research was done in five villages of the hinterland – Bhalam, Aarba, Malepatan, Kahun, and Baumara. First, the organic farms developed in Pokhara and its hinterlands was identified and mapped. A few of them (five) were visited and their evolution and present condition studied. In Pokhara, a squatter settlement was visited and possibility of involving them in urban organic agriculture was explored. An interaction with political personnel, hotel owners and farmers was arranged to see the possibility of linking farms to hotels/restaurants.

## DISCUSSIONS WITH FARMERS AND SERVICE PROVIDERS

### District Agricultural Office (DAO, Kaski) – Manohar Kaderia

At present, organic farming has been possible only for coffee, which has also been exported as organic. We can distinguish organic farming from inorganic farming even if the distance is 4 meter in case there is road and 5 meter in case there is no road. Nowadays, there is a belief that if the Gobar-gas (bio-gas) is mixed with toilet excreta then it cannot be organic.

The main areas where some organic agriculture has been practiced in Kaski are: Begnas, Hemja, Aarba, Bagmara and Malepatan. There are other small pocket areas. He said “my experience shows that it has not been possible to produce fully organic agricultural products at the present commercial basis. Moreover, individual efforts may not be enough to produce fully organic food. It could be possible if there is collective commitment. I have myself undertaken some organic farming in my own place called Purkot. But this has not been successful. I had planted orange trees, but all trees dried up. I have just fell down all these trees and come to the office. Therefore, it will be difficult to undertake organic farming at the present circumstances”.

Until now, even those who work as organic farming resource persons have not been able to generate income from organic farm alone. In a way, they are not able to stand on their own in a full sense of commercial benefits. But they are successful because of their other income and support from agencies promoting organic farming.

At present, organic production is meant only the production of vegetables. But even this organic farming has not been fully organic.

**Namuna Prangarik Krishi Sahakari Sanstha (Model Organic Agriculture Co-operative Organization; chairperson – Teknath Baral)**

This co-operative was established about 7 years ago and there are 60 member farmers in this organization. Most of the farmers have grown garlic, onion, cabbage, potato, radish, tomato, mustard leaf (a few plants)

and soap leaf (a few plants). These have been produced mainly for household consumption and there is not much surplus production for the market.

While observing the farm fields in Aarba, all the farmers seem to be committed to organic farming. The chairperson of the group and others few gave a big speech on this topic but their fields also did not have much farming. In the past Li-Bird had helped them and motivated them in this area. But not much is being done. Most farms were run by old persons, and they have sent their young sons and daughters either to study in Pokhara or to Malaysia and Gulf for employment.

**Tulsi Prasad Baral (Pokhara-7, Malepatan)**

He has been producing vegetables since 2027 BS. At present he farms in 3 ropani. He has devoted 1 ropani for Cauliflower and 1.5 ropani for Broccoli. In the rest of the land, he grows Chamsur, Palungo, garlic, and mustard leaf. There is also inter-mixing of the crops.

Even though it was started as organic farming, he has to use pesticides from time to time. Without it, it is impossible to grow crops for him. He has been doing this since a long time ago. At least one spray of pesticide is essential for the nursery plants. The growing of Zukuni requires a heavy dose of pesticides. The main pesticide that was used was Novan. Nursery is developed in one Anna land for 3 ropani farmland. In this nursery, one has to use 100mg Novan mixed in 5 litres of water. In case of bean crop, ash mixed with kerosene is used. While planting seedlings, he uses DAP fertilizer and cowdung and chicken manure. Borus is invariably used.

1 Kg Borus is used in a ropani land. The Borus helps to increase the weight of the vegetables. It is a kind of hormone. The chicken manure does the function of Urea fertilizer. About 50 gm of this manure is used for a sapling of cauliflower or cabbage or broccoli.

It is very difficult to undertake organic farming – he said. If the crop suffers from disease and insect/pest, the organic pesticides take long time to act and control the disease and pest. The crop is then damaged by these diseases and insect and pest. If pesticides are used, it gives a quick result and crop can be saved. As a result, farmer is tempted to use pesticides. This is especially so for the farmers doing farming on a professional or commercial basis. But farmers know that this is not a long-term solution, and then for the profit and making the ends meet in this costly and difficult time, he/she is tempted by the short-term profit. This has been the case here in this place. In fact, he uses less pesticide and other chemicals as compared to other farmers of this place. As a result, he has been able to maintain the farm and its quality since 2027 BS (1970). His kitchen garden is not that destroyed by pesticides nowadays.

He buys seeds from Agricultural Input Corporation and from the dealers in the market. This is done because the process of producing vegetable seeds is difficult and complicated. Moreover, many people do not yet know how to produce or separate good seeds from bad seeds. For them it is easy to buy improved seeds in the market. This has a practice here.

### **Bishnu Maya Timilsina, Pokhara-5, Malepatan.**

She has taken 3 ropani land on rent by paying Rs 30,000 annually. She can save Rs 100,000 annually. At the time of interview, she has grown cauliflower in 1 ropani, Cabbage in 1 ropani, carrot in 2 Anna, radish 2 Anna, mustard leaf and Palungo in 0.5 ropani, and mustard leaf and mustard in 0.5 ropani. She grows vegetables according to the season. She buys all the seeds from the market.

She uses DAP, urea, chicken manure. She also uses Borus and Zinc invariably as these are also to be used for the production of good vegetables.

She uses the Diathoin-45 and Novan according to what is needed. Until the crop is ready, these are to used 2-3 times depending upon the situation of the crops.

It is difficult to practice organic farming when all the neighbours are using the pesticides and fertilizers. It will be hard to earn profit and maintain the family livelihoods from organic farming.

### **Padam Raj Koirala, Pokhara-5, Malepatan**

Of the 5 sons doing vegetable farming, interview was taken with one of the daughter-in-law. Her name is Ganga Koirala. She has done farming in 3 ropani, and this land is hers. She had grown Cauliflower in 1 ropani, cabbage in 0.5 ropani, Broccoli in 2 Anna, Onion in 12 Anna, coriander in 4 Anna. She buys seeds from the market. The faster growth of the crop and protection from insect and

pest is the main attention while growing vegetables. "I can save up to 60,000 Rs a year from this profession" he said. Initially, she used to do organic farming. Then there was market expansion and then we were introduced to modern farming to produce more for the market – she recalled. Once chemical fertilizers and pesticides are used, it would be very difficult to not use them, as it would reduce the production drastically. At present, all farmers use these inputs for the production of crops. People think that not using them and bearing the loss as stupidity.

### **Marketing agencies and the marketing situation:**

There are a few attempts in the marketing of the organic products. This includes mainly the efforts of Shree Complex Pvt Ltd. owned by Jalaklal Shrestha. Ramesh Ranabhat of Ranipauwa, Pokhara has also been engaged in producing agro-products from local produce. He produces Gava, Gundruk, Tandri Karkalo, Masaura and different products of Masalas. He also produces local wooden products used in the households like Theki, Samelka etc. He brings wood from Pokhara as well as Tarai and produces wooden goods and materials.

Sri Complex was established with the aim of providing technical help in the production of organic products. This also imparts education. It collects products from various production locations and brings them to the market. The products sold here are not wholly organic. It is because the Complex has not been able to convince and make commitments from farmers for the production of organic food. It has not been able to give

organic certificate to the produce. They have attempted to have a certification program, but it has not been done yet. LIBIRD, NEST institutions are helping in this matter. At one time, about 5 years ago Pokhara Chamber of Commerce and Industries attempted to produce organic vegetables in Bhalam village. Similarly, LIBIRD tried this in Aarba Village. They invested a lot in training and supporting farmers. They also built an area in the market center where organic products are to be kept. These attempts did not help much except for creating some awareness in these villages. Therefore, some farmers in Bhalam village do not use chemicals for the production of vegetables. In some way, it has been able to have a name as 'organic producer'. People in Pokhara want products from Bhalam and this tag is given to products from other places also. This also shows that there is some demand of organic products, but this has not been matched by the supply system.

### **INTERACTION WITH FARMERS AND OTHER STAKEHOLDERS**

An interaction was organized on 15 February 2011 with farmers and other related agencies, including the members of the political parties. The interaction was held at the hall of Pokhara Chamber of Commerce and Industries.

Most farmers commented on the present seed supply system. They reported that seed of the local cauliflower has been lost. The seeds given by Agricultural Office did not work. Similarly, they complained about the loss of radish seed and coriander seed. They are until now getting the seed of Marpha mustard leaf. Taking the example of rice, farmers expressed the loss of various

varieties of rice like Thimaha, Mansara, Gurdi, Tauli, Aanga and Falaya. There used to Madale cucumber, which used to be big and also had medicinal value. These were health food also. They would not produce gas in stomach. On the difficulty of seed availability, Bir Tamang of Li-Bird said that for the organic food, even the seed should be pure, i.e., not produced as the seed of the crop grown with the help of fertilizer, pesticides and other chemicals. Similarly, there is no scope of hybrid seed in organic farming. Therefore, hybrid seeds are not to be used in organic farming. The only way is to save the local seeds and improve the seeds through the selection process. There are improved seeds within the local seeds. Li-Bird has an experience of developing infrastructure for organic farming in Begnas, Arba and Kalabang villages, but things have not moved as planned. The other important thing is the soil. At present, soil is dead and it cannot produce anything.

Another problem faced by farmers is that of marketing. A farmer narrated that he produced cauliflower without fertilizer and pesticides. The produce was small and did not look nice. He had a hard time in selling this. As a result, he sold it at half the price and came back to village.

Farmers knew that the use of fertilizer and pesticide is like a temporary relief or the 'warmth of the piss'. This is so with the hybrid seed also, which has reduced our self-sufficiency in seeds. But they also do not know what can be done as all are using these inputs and there is no labour in the village. Migration for work in foreign countries has led to reduction in the labour force in the villages. As a result, people now do not keep animals. Similarly, the

young people staying in the village have also followed the behavior of the tourists and buy expensive things.

Farmers have no support for the organic farming. There is no subsidy in anything that organic farmers need as input. There is no organized effort for the promotion of organic farming including marketing. Even the simple things like animal-shed improvement, Jhol-Mol medicine and earth-worm farming for the treatment of the diseased plants and fertility of soil need resources. If supports are provided all farmers would go for this.

In Armala village too farming has been declining because of foreign labour migration. There is still no awareness of organic products. In the Pokhara festival, organic products did not sell well, and farmers returned back their products.

In the past, Pokhara Chamber of Commerce and Industry tried to make Bhalam a model village for the production of organic produce. At that time, there was a support from German government. It constructed a Sabji-Mandi, which was not used properly. Similarly, training programs were organized. In the bazaar center a collection and selling point was developed. But, organic foods were not produced. The hotels did not get produce in required amount and on regular basis.

In a way, there is no political commitment and there is no organization of farmers to press their demands. As a result, agricultural sector has lagged behind.

The organic farms and produce has also suffered from certification system. Most of the organic products are not really organic at present. Unless it is tested, it would be hard to know.

Suggestions given by the farmers were:

- Identify the watershed in which organic farming is to be done and government should declare that in this zone no one should use chemicals and should practice organic farming. At present, a farmer organic farm is destroyed by neighbor's inorganic farm.
- Organic farmers need support from government in infrastructure development like irrigation, animal-shed improvement and in marketing.
- The biggest problem has been in marketing and thus this need improvement.
- Organization of farmers and their networking is essential.
- At present, the volume of the production is less and thus marketing has been difficult. Therefore, attention should be given to improve the quantity of production.

Awareness and education of the young people in both urban area and rural area regarding the importance of sustainable farming and the need to engage in this area for the household economy and community development.

## WAY FORWARD

It is seen that there have been some attempts in developing organic farming in Pokhara and its environ. However, these attempts have not been fully materialized into increase in the production of organic foods. There are positive developments in terms of farmers' awareness that inorganic agriculture cannot go that far without damaging soils, water and health of the people. But again, the response to this has

not come in effective way. Few farmers are involved in organic farming but their production is not substantial. In fact, they say that they cannot do it in a big way as they do not have adequate labour force.

The organic farmers who are known in the society and community as organic farmers also derive a substantial part of income from other than the farming itself. This has given an impression to many that it is not economically viable in the present condition without premium process and other supports. In fact the benefits of organic farming are more in terms of health and environmental conservation and long-term sustainability. For these social benefits farmers do not get anything. On the other hand, farmers using the fertilizers and pesticide get the benefit from the government in the form of subsidy in these inputs.

There is also mismatch in the supply and demand. There is demand in the urban areas by individual consumers and hotels and restaurants. But there is no regular and adequate supply. Whatever small quantities are produced are also not taken to the place where the demand is there.

The certification process is also a problem and there is controversy as to how to organize this.

In the light of the present, situation it is necessary to do the following activities:

Study of organic farms and how much environmental and social benefits they provide to the community or society. The quantification or description of these benefits will be important to convince the government and donors to support the organic farmers. It could give activist organization the advocacy message for the

benefit of the farmers. In the initial stage, it is not possible to convince the farmers to totally run organic farming on an organic basis. The sudden decline in production after initiation of organic farming does not motivate farmers to adopt this. Therefore, an incentive mechanism is important.

Marketing of the products came as an important problem. Ways to produce organic products in marketable quantities is also important. It is true that many farmers are small farmers, but their co-operation in assembling a marketable supply from their community or location would be necessary to earn extra income from their production – apart from their own consumption of good food.

Possibility of producing pure seeds for the organic farmers through farmer-to-farmer production and exchange of seeds is necessary.

Agro-tourism needs to be integrated with organic farming for the additional income so that farming becomes lucrative. This could also help retain youths in farming profession.

The demand of farmers that a watershed should be considered organic is an important one. This has come from the experience of farmers that unless a whole watershed is not declared organic, it would be difficult to maintain pure organic farm. This would also be helpful in marketing the product, as it would provide an economy of scale. To this end, government may also need a legislation and procedure to enforce this provision. This requires a consultation and formulation of tentative legal provisions, which could become a law.

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