

## **SUSTAINABLE MODEL OF ORGANIC AGRICULTURE: A CASE STUDY OF NEPALESE FARMERS**

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**ABSTRACT:** *Epistemology of organic agriculture is logically and practically associated with the conventional farming practices. Organic agriculture can contribute in the social life of people by improving health and ecology. It is even more important for the preservation of natural resources too. In relation to the importance of organic agriculture, the main objective of this study was to develop the sustainable model of organic agriculture. The study was based on the inductive approach; qualitative design. Study was conducted in 4 districts of Nepal among the 614 respondents. The result found that there was significant contribution made by the organic agriculture to improve the socio-economic status of farmers as well as to care the relationship between the human being and their environment. Family farming system is the fundamental base for changing trend of agriculture in worldwide practices. There is need to protect and enhance family farming through farmers' cooperative for the sustainability of organic agriculture. The study developed the sustainable model covering the need of infrastructure development, policy improvement, and motivational factors for farmers and changing process of modern agriculture to organic agriculture. The roles of government, non-government, private sectors, individual farmers and consumers are equally important for the sustainability of organic agriculture. The model focuses on the collective effort of all responsible stakeholders. There is need to test the effectiveness of this model.*

**KEYWORDS:** Family Farming, Integrated Pest Management, Organic Agriculture, Sustainable Model

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### **INTRODUCTION**

“Organic farming is defined as a form of agriculture, which does not use chemical inputs in its production process, and enhancing the biological and ecological processes to promote soil fertility and good health of animals and plants (Gafsi, Le, & Mouchet, 2010, p. 4)”. It involves complete view and it depends on ecological processes, biodiversity as well as cycles adapted to local circumstances rather than the use of external inputs with hostile effects. It goals to promote fair associations and a good quality of life for all related components.

The traditional system of agriculture in Nepal was organic but by passing of time, the practices changed more towards inorganic which is a direct threat to agriculture productivity, environmental quality and human health (Krishna P. Paudyal, 2010).

Tamang et al. (2011, 3 June) write on the concept and history of organic agriculture in Nepal that “the organic agriculture is a very common word in Nepali agriculture sector. Over a century, traditionally farmers in hills and mountains are following the farming practice, which is similar to organic farming. However, many of them have no idea that their traditional practice is called organic agriculture (p. 3)”. More than that certification process also takes longer time and farmers do not go on that process. Tamang and her colleagues write on this issue as “because of the lengthy certification process the products produced through organic means do

not get recognition as organic products (p. 3)”. In the case of development scenario of modern inorganic trends of farming in Nepal, Tamang et al. (2011, 3 June) write that “There is increasing trends of using inorganic chemicals terminator seeds and adopting high input technologies. The population growth and demanding cash income to run the household forced farmers to increase their agriculture production including food therefore farmers started to adopt the modern farming techniques (p. 4)”. Time and again there are many reports on the harmful effects of unbalanced and excessive use of chemical fertilizer and pesticides on human as well as animal health and environment. To reduce those hazards, different kinds of environmental friendly agriculture/farming promotion efforts such “alternative agriculture, ecological agriculture/farming, bio-dynamic agriculture, regenerative agriculture, natural farming, permaculture, sustainable agriculture, with organic agriculture (Tamang, Dhital, & Acharya, Status and scope of organic agriculture in Nepal, 2011, 3 June, p. 5)” are in practice.

An increasing number of reports claim that organic agriculture can be a vehicle for poverty reduction, and empirical research approves a definite relation between organic agriculture, food security and poverty decline in developing country contexts (IFAD, 2003; Araya & Edwards, 2005; Egziabher, 2005). The Food and Agriculture Organisation (FAO) steered a wide report of organic agriculture’s potential to contribute to food security in 2002, concluding that organics is a positive strategy not only for trade, but for sustenance farmers attempting to meet family food necessities and perhaps sell surplus in local markets. Research from numerous developing countries points to lower production costs in organic systems because less external inputs are used (Rosegrant & Ringler, 2005) and price premiums of up to 300% may be gained on the international market (Setboonsarng, 2006, p. 8). Other studies have found that even without price premiums, farmers are adopting organic agriculture to save costs and achieve viable yields (Scialabba, 2002). Studies also show health improvements for farmers under organic systems. Farmers in India said that symptoms associated with pesticide poisoning disappeared after conversion to organics (IFAD, 2005), and a Latin American study showed that farmers perceived themselves to be better after adaptation to organics (IFAD, 2003). On a macro scale, a comparative paper published in 2007 compiled data on crop yield from 293 studies, and found that organic methods could produce enough food on a global per capita basis to sustain the current human population, and possibly an even larger population, without increasing the agricultural land base (Badgley, et al., 2007). Research is still biased towards certified market-led organic approaches, and the literature on the work of numerous organizations promoting organics for subsistence and local production-consumption networks is poorly developed (Parrott & Wright, 2007).

Organic Agriculture has a focus on environmental issues and food security. Organic Agriculture claims to provide benefits in terms of environmental protection, conservation of non-renewable resources, improved food quality, improve health status and the reorientation of agriculture towards areas of market demand. Additionally, organic farming increases the quality of soil, water, air and biodiversity. Soil building practices such as crop rotations, inter-cropping, symbiotic associations, cover crops, organic fertilizers and minimum tillage are central to organic practices. Similarly, the organic agriculture has significant contribution to promote the socio-economic life of farmers. So, considering the overall benefit of organic agriculture, the study aims to develop the sustainable model of organic agriculture from the study of organic farmers of Nepal.

## METHOD

The study was based on the qualitative research design focusing on the collection of people's perception and practices of organic farming. It had adopted the 'Inductive Approach'; develop the model on the basis of primary data. The study was done in four districts (Kathmandu, Lalitpur, Bhaktapur and Dhading) of Nepal. The primary respondents were the organic farmers and secondary informants were the experts, policy makers, development practitioners and government authorities. The study conducted among the total 614 respondents. The study developed the semi-structured types of questionnaires to collect the opinion of respondents. Reliability and validity of instrument was tested by doing the pilot study before the implementation to collect the final data. Purposive sampling technique was adopted to select the respondents. Perceptual data was collected and did the thematic analysis to develop the sustainable model of organic farming. As the limitation of this method, the study had only developed the model but not tested.

## RESULT AND DISCUSSION

According to the objective of this study had focused to explore the sustainability framework of the organic farming. It is well understood that as the principles of organic agriculture, it significantly contribute in the human health and environment so it is necessary to promote the organic farming. The study had identified some challenges of organic farming as experienced by the farmers; high production cost & high price of products, low quantity of product, no adequate market, certification problems ...etc. In spite of all these problems, consumers are conscious on their health and environment so from the individual level to Government level should contribute their effort and should honestly play their roles and responsibilities to sustain the organic farming so that human health and environmental pollution can be addressed.

Sustainable organic agriculture should meet the needs of the present generation without jeopardizing the needs of future generations. It must also be economically sustainable to the farmer, and to society as a whole. Global warming is creating increasingly unpredictable weather patterns in the world. Organic farms have higher yields than conventional crops when under stress caused by drought, heat, excessive rain or unseasonably-cold weather. As well, organic crops have higher pest and disease resistance.

The study had conducted the face to face interview with the subject experts of organic agriculture to explore the strategic ideas of sustainability of organic agriculture in Nepal. Experts' opinion showed the various opportunities of organic agriculture in Nepal which also ensured the need of sustainable model of organic agriculture.

“Organic needs the separate organization having with competent manpower, adequate resources and effective management. Organic should be one main area of Agriculture Ministry. Government should be careful in management of main 3 sector of organic agriculture. These are: i) **Software:** establish Research Education, Training, promotion of knowledge and information, ii) **Hardware:** availability of organic fertilizer, seeds, land, storage, lab, transportation, auction market ...etc and iii) **Market:** coordination between and within the national and international market for the greater sells and better price. If these 3 areas can be strengthen then organic agriculture can be sustained which can develop the growth of Nation also.” - **Basanta Ranabhat, Chairman, Organic Certification Nepal Pvt. Ltd (Nepal Govt. approved national organic certifying agency in Nepal)**

“There is need of separate Board of management and promotion of Organic agriculture which can increase the quantity of Export in International market. Developed countries are promoting the organic agriculture because of their increasing consciousness of climate change, environmental degradation and caring of health. Promotion of organic training and certification can be managed through the single Centre.” - **Kumud Shing, Director, Alpine Coffee Estate**

**Prakash Shrestha**, Director, Olla Coffee Center said that there was need of clear policy and program of Government to make the organic agriculture sustainable.

**Dhakeswor Ghimire**, Founder, Nepal Organic Coffee Producers Association shared his ideas by saying that there was need of separate entity to manage the organic system. Board should be non-political and result oriented. Government should aware the customers for the maximum use of organic products of Nepal and needed to control export of non-organic goods from the international market.

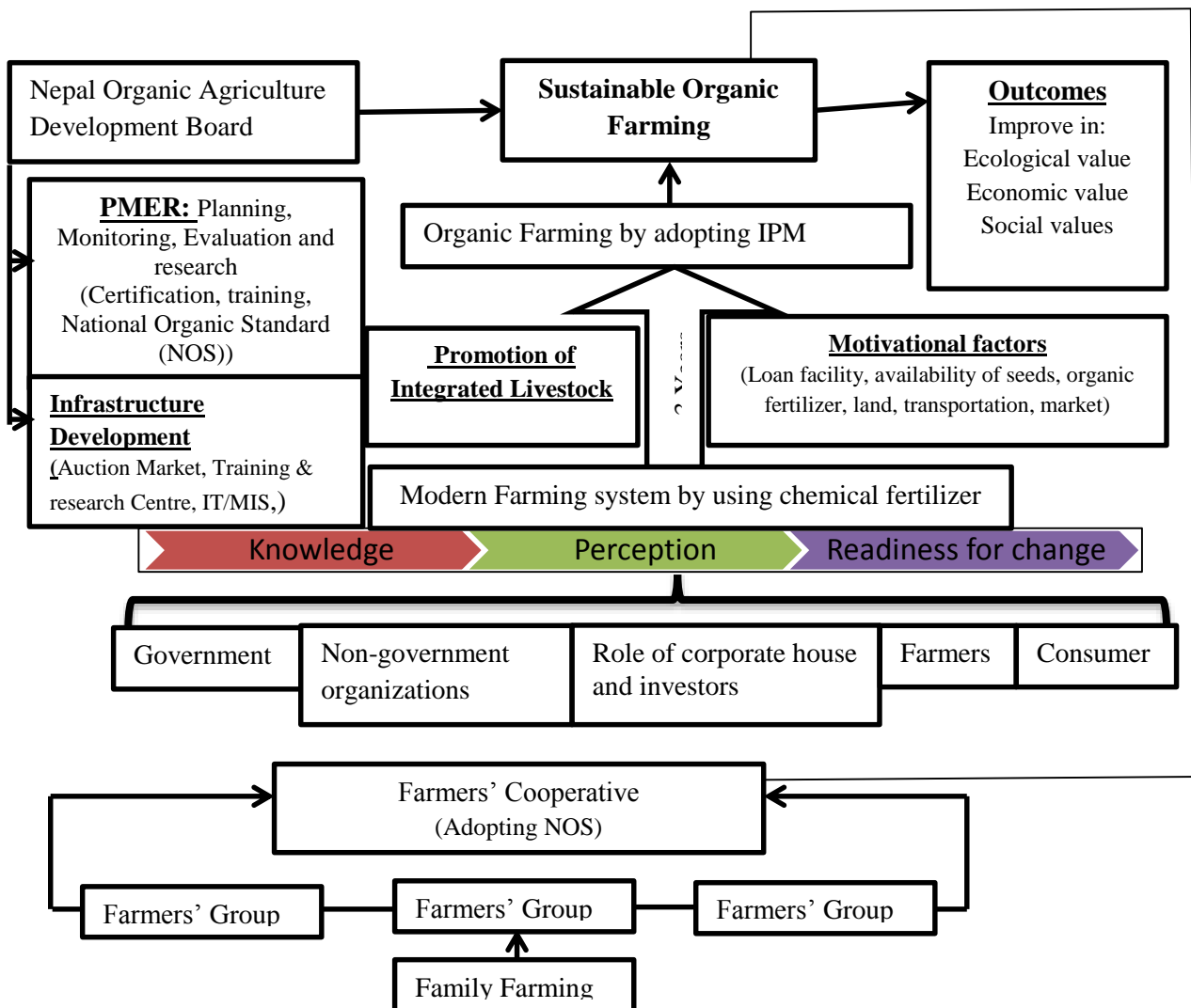
The need of separate Board for the management of organic agriculture was asked by many experts during the study. **Khadga Bhakta Paudel**, Senior Scientist (Rtd.), Senior Scientist (Rtd.), Nepal Agriculture Research Council (NARC) also said that Nepal Government had to formulate the separate Organic Board who could manage the marketing, certification, monitoring, research, provides or hires required technical experts, develop the 5 or 10 years strategies plan of production. Promotional activities could ensure the quality of organic goods in international market. Non-governmental organizations, private sectors and farmers should support the program of Nepal Government so that contemporary situation of ‘Push and Sell’ could be changed into cost effective organic farming

Different perception was found regarding the need of separate Organic Board. According to the Dr. Surya Pandey, Soil Scientist, Kiwi Research Center, Kavre, government could manage the promotion and monitoring of organic agriculture from the existing organizational system. Similarly, Dr. Bhartendu Mishra – Member of National Planning Commission, Aashis Thapamagar – Manager of Nativ Multipurpose Pvt. Ltd. Kathmandu and Dipak Prasad Koirala – Chairman of Nepal Junar Cooperatives Central Federation Ltd. Kathmandu also supported the statement of Dr. Pandey by saying that Nepal Government private sectors should be responsible to promote the organic agriculture. They also said “government should make the law against the pesticide and chemical fertilizer users and need to prepare the strategic plan of organic production. Government should establish the organic fertilizer production factory, trained the farmers, mobilize the technical manpower in community, provide the seeds and loan facilities.”

Manoj Acharya - Coordinator of Participatory Guarantee System, Kathmandu emphasized the need of clear policy of government, separate organic board, dissemination of organic guideline, monitoring, marketing, certification, coordination and research to sustain the organic agriculture in long run. The opinion of Mr. Acharya was supported by the Hiralal Rokaya - Nayapati Multipurpose Agro Firm, Kathmadu and Dilip Rai - Owner, Nepal Green and Specialty Tea Pvt. Ltd.

Dr. Yubabdhoj G.C - Director General, Department of Agriculture, Ministry of Agriculture, Nepal showed the need of production of organic fertilizer and pesticide in Nepal. He said “Agricultural diversification is important for the Economic development. Organic agriculture is suitable in Nepalese environment and beneficial for the Nepalese farmers also from the socio-economic perspective.”

From the overall analysis of qualitative and quantitative data of the study, the following sustainability framework of organic agriculture is recommended:



**Figure 1: sustainability framework of organic agriculture**

The above conceptual idea of sustainable organic farming shows the interrelationship between the different factors and actors which can play the vital roles to sustain the organic farming. The model explains about the process of readiness for the change. It says that when any new technology comes in the society, people first gathers the knowledge of that particular technology then think about the cost and benefit of it and finally decide the acceptance and rejection of that technology. Here, model focuses on the need of change in the modern farming system through the IMP system. It assumed that if farmers will practice 3 years of farming with IPM it will make easy to transfer into pure organic farming. The model also emphasize on the management of separate organic board that can overall manage the requirement of software and hardware part of organic farming. There is need of motivational factors and promotion of integrated livestock also which can support to sustain the practice of organic farming. The previous studies of agricultural system and this study also found that there is family farming

practice in Nepal. Family farming system is more individual centered. Family decides about the farming practices on the basis of their past experiences, socio-cultural values and norms.

Various previous literatures have highlighted the importance and contribution of 'Family Farming' in the promotion of agriculture and development of society. According to the Agence Française de Développement & Sustainable Development Department (SDD), family farming can address the challenges of food security and employment in future world. It said that "in 2050, the planet will be populated by 9 billion inhabitants. Most population growth will take place in developing countries and cities, which will require more resources. Dwindling energy supplies and climate change will call for new models for sustainable agriculture. Family farms are capable of meeting these challenges and have demonstrated their capacity for innovation and adaptation over centuries. They will however need support, particularly in countries in the global South, from ad hoc policies and mechanisms (such as professional training and land tenure security)" (AGENCE FRANÇAISE DE DÉVELOPPEMENT & SUSTAINABLE DEVELOPMENT DEPARTMENT (SDD) , 2012, p. 2). In Nepalese practices, farmers are individually working and promoting their goods in market that will be the problem to compete in market and sustain in long run. There are also some limitations of 'family farming'; limited access to credit, marginal position in the value chain, lack of infrastructure, limited access to information, and a marginalized role in international fora and development agendas which was accepted by the Cinzia Pagni, WFO (The World Farmers' Organisation (WFO), 2013). Family Farming also crates the problem of organic certification as they have to pay separately for each grower. So, this model recommended developing the Farmers' Group which can advocate the issue of organic farmers among the concerned authorities. Gradually, the Farmers' Group should be included and managed by the Farmers' Cooperative. It will be more formal organization of farmers and can support to manage the problem. For instance, the cooperative can collectively certify the product as organic and also provide the technical trainings, education on pest management, crop protection and to enhance the overall productivity and crops yield. Farmers' Cooperative should promote the productivity and capacity of family farming because 'family farming is the basic building blocks of sustainable organic agriculture'. All these effort shown in the model can be the supportive to sustain the organic farming.

The model has clearly mentioned the roles and responsibilities of potential actors who can play the vital roles to sustain the organic agriculture in Nepal. The detail roles are explained below:

**Role of Government:** government should be more careful about the planning of sustainable development of organic agriculture, easy loan support to farmers, promotion of PGS, and formulation of 'organic agriculture board', establishing the Training and Research Centre 'and' auction market. Besides that government should facilitate to develop the networking with the international market of organic products. Monitoring and supervision should be strong and government should award to those who will do better and punishment should be given to those who will do intentional mistake.

**Role of Non-governmental organization:** non-government organizations should involve in promotion of training and dissemination of organic agriculture. They should involve awareness rising to farmers and consumers about organic agriculture.

**Role of corporate house and investors:** they can contribute by investing in the field of organic agriculture and can develop the networking in international market. They should be responsible

to ensure the quality of organic agriculture by supporting in organic certification and using the trade mark of organic.

**Role of Farmers:** Organic farmers diversify their businesses by growing several crops at one time, often having both livestock and field crops, and sometimes value-added enterprises as well. The diversification reduces economic risk. As well, enterprise diversification makes it easier for farms to be more self-sufficient in terms of nutrients, livestock feed, soil organic matter and energy. The most challenging time is the transition period as farmers switch from conventional to organic agriculture. During this period, the price premium is absent and yields are low. Sometimes farmers can receive a minor price premium for transitional production, with a price higher than conventional prices, but lower than the certified organic prices. Some farmers find that the yields rebound within just a few years; this is most likely to happen with farmers who were using only minimal inputs. Other farmers, who were very dependent on herbicides, fertilizers and pesticides, find that it takes up to a decade for their yields to recover

**Role of Consumers:** consumers should be aware about the benefit of organic agriculture in health, environment and socio-economic status of people. Consumers should give the first priority to purchase the pure Nepalese organic products. They must involve in the dissemination of information and knowledge of organic products.

Regarding the sustainability approach of agriculture, various previous studies had also explored the different way and techniques of sustainability. Japanese philosopher *Osamu Soda*, in the recently released book *Philosophy of Agricultural Science*, describes a “process for increasing total welfare or realizing comprehensive values.” The concept provides for balance between ecological values, economic values, and life values in the context of “ba,” or place. It is in the local that farmers, research, and policy come together in the context of human community to solve problems and achieve goals (2006).

In coming years, nations, local communities, and individuals will have to make many difficult ethical decisions concerning the competing requirements of agricultural production, ecosystems, economics, and social justice (Oliveira, Vaughan, & Rykiel, 2005). Locally based agriculture can provide ecosystem services that are of great value in particular regions. For example, in the Minnesota River valley, impacts from row crop production have made the river one of the 20 most endangered waterways in America (Mulla & Mallawatantri, 1997).

There are numerous studies on possibilities of organic agriculture in developed and under developed countries. How is the feasibility of organic agriculture in under developed countries like Nepal? Urs Niggli (2015) writes on that:

While the crop productivity of organic farms appears to be 0.7–0.8 of that of intensive farms in temperate zones, the yield ratio in marginal regions of Africa where subsistence farming is still widely spread, has been found to be in favour of organic farms Hence, in resource- and income-poor countries, organic farming seems to offer an appropriate and low-cost way to increase productivity and to improve farm livelihood. (p. 1)

As Niggli has stated that possibility of organic agriculture is easier in those countries where still the practice of agriculture for subsistence is. Almost Nepalese farmers are also practicing subsistence farming.

Family farming is another way of applying alternative agriculture. This type of model occupies limited area and generates job and promotes for organic production. Saldanhaa et al. (9-14 August 2015) write on the possibility and viability of family farming for sustainable farming:

Family farming is featured as the one growing in which the aim of tasks on the premises is decided by both the producer and his family. Family work force is superior to hired work and the area of the property is within a limit set for each region of the country. Such way of farming has demonstrated characteristics of adaptation and feasibility, once it is not only a way of generating jobs and income in the rural areas but also a way of developing sustainable production. (p. 1)

This type of alternative agriculture is suitable even in Nepal because Nepal has not practiced yet commercialized and industrialized farming. Still family farming is on practice in rural areas. Such model promotes for sustainable farming.

The concept of family farming covers various elements. From a sociological perspective, family farming is associated with family values, such as solidarity, continuity and commitment; in economic terms, family farming is identified with specific entrepreneurial skills, business ownership and management, choice and risk behavior, resilience and individual achievement.

Family farming is often more than a professional occupation because it reflects a lifestyle based on beliefs and traditions about living and work (European Commission , 2015). Family farming represents the social base for most developing countries and constitutes the main form of agricultural organization worldwide. It contributes to both domestic and international markets. Family farming thus accounts for almost 80% of global food production, 98% of food production in Sub-Saharan Africa and almost all cotton, cocoa and coffee production worldwide. Covering around 40% of the planet's agricultural land, family farms are the number one source of employment worldwide. Yet they also paradoxically account for the majority of farmers living in poverty and food insecurity (AGENCE FRANÇAISE DE DÉVELOPPEMENT & SUSTAINABLE DEVELOPMENT DEPARTMENT (SDD) , 2012)

Saldanhaa et al. (9-14 August 2015) have proposed a model for family farming sustainable development, is called AGROINDEX. This model aims to contribute to:

Monitor the aspects of production, productivity, sustainability and human factors by the farmers themselves thus contributing in the search for sustainability and empowerment of families and the communities respectively; Decision-making by the family farmers that contributes to improve the production management on sustainable bases; Subside decision-making of the fomentation institution managers concerning the need of investments and results; improvement the management of projects of qualification and fomentation projects enabling the comparison of indicators before and after the interventions.; Release a set of information which will subside the managers to formulate and implement public policies that allow adequate conditions for local development. (p. 6)

Such model seems to be worthwhile even in the case of Nepal. The nature of farming in Nepal resembles as mentioned by Saldanhaa et al.

“Organic agriculture can contribute to meaningful socio-economic and ecologically sustainable development, especially in poorer countries (Kilcher, 2007, p. 31)”. This is still difficult on the one hand to the application of organic principles, which means effective managing of local



resources for example, local seed varieties, manure, etc. and therefore cost efficiency. On the other hand, the market for organic products at local and international level has great growth prospects and offers creative producers and exporters in those areas then it creates excellent opportunities to improve their income and living conditions.

Organic products gain more income than conventional one. Kilcher (2007) states, “Certified organic products provide access to attractive local and international markets for developing countries, while the producers generate higher incomes. In addition, due to long-term contracts, income is generated more continuously than in conventional trade (p. 43)”.

There are many more possibilities and benefits of adopting organic agriculture. However, farmers usually experience a decline in harvests after leaving the use of artificial inputs and converting their farm to organic production. “Once the agroecosystem is restored and organic management systems are fully implemented, the farmers get good harvests” (Kilcher, How organic agriculture contributes to sustainable development, 2007, p. 41). The development of crops fluctuates, and depends on inherent biological factors and natural resources, the farmer’s expertise and the extent to which synthetic inputs were used under previous conventional management. If conversion to organic takes place on the basis of a low-input system, which is often the case for poor farmers in developing countries, yields under organic management tend to be more stable compared to the previous management system (Kilcher, How organic agriculture contributes to sustainable development, 2007, p. 41).

A sustainable way requires creating holistic, multifunctional farming systems based on the needs, limitations, and resources of communities—human and ecological. Agriculture based on a series of isolated components—crops separate from livestock, farmers distanced from consumers, farming separated from culture and production systems disrupting ecological processes—won’t sustain agriculture in the future. The future of food, the land, and society requires making agriculture whole.

## CONCLUSION

Organic agriculture was found important from the perspective of health and environment. From the study, it was found that more than 90% respondents were satisfied from the income of organic products and they were using its income for the promotion of child education, using the health facilities, developing the infrastructure facilities in house. People perceived the need of sustainability of organic agriculture in Nepal because it discourages the modern agriculture having the high use of pesticides and chemical fertilizer. There was high chance to sustain the organic agriculture in Nepal because the conventional farming practices were more similar to the organic agriculture as well as there is family and small-scale farming practices in Nepal. Family decides the needs and promotion of agriculture on the basis of their cultural values, social norms and practices. Family and small-scale farming are inextricably linked to world food security. Family farming preserves traditional food products, while contributing to a balanced diet and safeguarding the world’s agro-biodiversity and the sustainable use of natural resources. But there were some difficulties of family farming so this study recommended developing the Farmers’ Cooperative which can contribute to address the various issues raised among the ‘family farming’ because ‘family farming is the basic building blocks of sustainable organic agriculture’. The sustainable model also promoted to manage the integrated livestock practices and farmers should be encouraged by providing the motivational

incentives by Government and non-governmental organization. The model clearly explained the roles and responsibilities of different actors to sustain the organic agriculture. Among them, government should take the serious lead role to promote and mobilize the resources for the sustainability of organic agriculture. If organic agriculture can be sustain then finally it will increase the Ecological value, Economic value and Social values. As the limitation of this study, the study has developed the sustainable model on the basis of primary and secondary data so the further researcher can test the model to measure its effectiveness.

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