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Rich Biodiversity and Prosperous Communities

In search of sustainable agriculture: A review of national policies relating to organic agriculture in Nepal

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Foreword

Nepal has a comparative advantage in developing sustainable agriculture; and the existence of some good practices that are scattered across the nation can be an asset to this direction. But efforts are still lacking to consolidate these good practices into a viable system of value chain. There is no any appropriate agribusiness model to apply under such situation. The sector is still mainly dominated by subsistence farming, traditional farming practices, land fragmentation, and low level of knowledge and suffers with low productivity and production. The sector is struggling to catch up with rapid changes in terms of new technologies, viable products, emerging markets and business possibilities. There is a widespread negative perception among the local people towards farming as menial, tedious and an un-prestigious employment partially due to small remuneration and the use of traditional farming practices. These factors have led the rural people, especially youths, to migrate to urban areas and abroad in search of better livelihood opportunities and higher incomes, thus leaving their children and elderly family behind. This has been negatively affecting the technological up-gradation, which would increase production and the success of rural entrepreneurial activities.

In order to tap the potential that exist in Nepal's agriculture sector and address the challenges of resource degradation, fragmented land holdings, erratic climate systems, poor market linkages and labor shortages currently being faced by this sector, ANSAB envisioned a program named Ecosystem-based Commercial Agriculture (ECA) with the aim to transform the traditional forestry and agriculture into climate smart, attractive and socially prestigious business. ECA, as envisioned by ANSAB, increases the production and productivity in a sustainable way, improves the resilience of agro-ecosystems and people to climate change, reduces/removes green house gases, and attract youths and make it socially prestigious generating better remuneration. ANSAB has started some of the initial key components of ECA, with financial assistance from blue moon fund (bmf), that are crucial to test its effectiveness, make a ground for efficiency testing and develop a program for scaling-up.

In this background, ANSAB has carried out this study to review the available national level policy documents and available literatures related to agriculture in order to analyze the current situation and policy gaps in the field of sustainable (organic) agriculture in Nepal, that will be helpful for designing strategies for the adoption and sound implementation of sustainable agriculture in the country.

We are grateful to Dr. Kishor Atreya for conducting this study. We appreciate Puspa Ghimire, Programs Manager of ANSAB for providing regular feedbacks and suggestions during the study, and Sudarshan C. Khanal, ANSAB's Research, Planning and Communication Manager for his editorial support to the study report. We also acknowledge support from all the people, organizations and institutions that have directly or indirectly contributed to this study.

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1. Introduction

From the very beginning to the recent past, most of the Nepalese farmers sustained themselves by farming. They used to farm variety of crops within a limited area for their own consumption as well as for their neighbors. In case of surplus, they used to sell the products in urban areas. Their economy was small, but the practice was sustainable in terms of efficient resource utilization, enhanced social integration, and human dignity. However, after 1970s, the use of synthetic fertilizers and pesticides increased dramatically to nurture so called 'high yielding crops' – resulting an arrays of social, environmental and ecological disturbances. To overcome such externalities, a new type of agriculture is being popularized as 'sustainable agriculture'. Organic agriculture is advocated as one of the sustainable production systems that not only helps minimize externalities of the industrial agriculture, but also increases human nutrition by providing diversified crops including fruits and vegetables, and livestock. Scientific studies show that organically grown foods have little more nutrient density than those conventionally grown.

The emergence of organic agriculture can be tracked back to the early 20th century, when the Austrian philosopher Rudolf Steiner delivered a series of lecture in 1924, which were later published as "Spirituals Foundations for Renewal of Agriculture" that coined the term 'biodynamic agriculture'. Later its development followed by a number of key people, independently in the USA, Germany, and United Kingdom; and at present it is guided by the International Federation of Organic Agriculture Movement (IFOAM) four principles: 'the principle of health', 'the principle of ecology', 'the principle of fairness' and 'the principle of care'. The IFOAM General Assembly in Italy, June 2008 defines organic agriculture as "a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved."

The Government of Nepal (GoN) for the first time in the history of planning emphasized organic agriculture in the 10th Five Year Plan. Since then, a few institutions, group of farmers, and a few innovative individuals showed affection to organic agriculture. Its adoption is below than expected. There are still many individuals, including professional and government staffs that perceive that organic

Box 1
Myths on organic agriculture

Myth #1: Organic farmers use no inputs.
Myth #2: Organic crop yields are always less than conventional.
Myth #3: Organic farms are mostly small vegetable growers, not real farmers.
Myth #4: Products from organic farms must receive a premium for this to be profitable.
Myth #5: You must certify the whole farm, not just one field.
Myth #6: Organic farming is only for the counter-culture folks, not real farmers.

Typical for Nepalese society

Myth #7: Organic agriculture is for earning $.
Myth #8: Organic products are only for export to boost our economy.
Myth #9: Organic products are luxurious goods, so Nepalese people could not afford.
Myth #10: Farmers by default are practicing *organic* in many rural villages.

agriculture as *'crop production with no application of chemical fertilizers and pesticides at all'* and *"the organic products are only for export'*. There are a few myths of organic agriculture (see Box 1). These are untrue because the organic agriculture goes beyond these. It is a way of agriculture life, a social tribute to the animal and plant with care and fairness, and believes in the sustainability of the production system for present and future generation through improving/maintaining soil health and thus is more resilient to the global climate change.

Organic farming gives the highest emphasis on environmental protection, on livestock production, and on animal welfare considerations. It avoids or largely reduces the use of synthetic chemical inputs such as fertilizers, pesticides, additives and medicinal products. The production of genetically modified organisms (GMOs) and their use in animal feed are forbidden. It differs from other agricultural production methods in the application of regulated standards (production rules), compulsory control schemes and a specific labeling scheme. The organic farming is environmental friendly and sustainable, and the organically produced foods are healthier. The organic agriculture is rapidly growing in all parts of the world because of increased people's willingness to eat the organic product even at higher premium price. In Nepal, the domestic demand for organic products (due to increased awareness) is increasing along with the increasing demand from other countries as well. However, adoption of organic agriculture at field so far is limited, with a mere 9,361 ha (0.20% of the total agricultural land area) in 2013. Therefore, there is a great scope and potential of organic agriculture in Nepal.

The Government of Nepal (GoN) has formulated different sectorial policies and some of them support organic agriculture promotion. Its existing policies to support organic agriculture are limited and fragmented. Some policy documents are even against of organic agriculture, for example, subsidies in the chemical fertilizers price that increases the consumption of chemical fertilizers. There is no comprehensive review of the existing policy documents related to organic agriculture, which if done, will be extremely useful for the future direction of the Nepalese agriculture.

1.1. Objective of the Study

The main objective of this study is to review the available national level policy documents, published literatures, and other reports related to agriculture in the search of *finding changes, the present situation and policy gaps in the field of sustainable (organic) agriculture in Nepal. While doing so, the study describes a few characteristics and rationale, and proposes four principles of recently envisioned sustainable agriculture in Nepal - the Ecosystem-based Commercial Agriculture (ECA).* Based on the reviews and gaps identified, the study recommends future strategies for the adoption and sound implementation of sustainable agriculture in Nepal.

1.2. Methodology

The study adopted in-desk review of available literatures. It reviewed present national level policy documents, published literatures, and other reports and scrutinizes only those, which are related to organic agriculture. Visits to some government offices, non-governmental organizations (NGOs) and local libraries were made to collect relevant information. Priority was given to the national policies and strategies, programs, and periodic plans. Sectorial policy documents were reviewed but at the broad sense. Also a few high level officials at the Department of Agriculture were interviewed. A few organic farms were visited and the interview was done with the farm owners. Similarly, a few

local NGOs working in the field of permaculture and organic agriculture were also taken care of while collecting data. See Annex 1 for name of individuals interviewed.

1.3. Structure of the Report

The report contains **five** chapters plus references and appendixes. The *first chapter* so far describes the objective and methodology of the study. The *second chapter* presents historical changes in agriculture, and tries to justify the need of sustainable agriculture and finally the ways of converting to it in Nepal. The second part of this chapter presents the history of organic agriculture in the world, and is followed by the *third chapter* that describes the history of organic agriculture in Nepal. The policies, national standard, working guidelines, and the periodic developmental plan's priority on organic agriculture are described in the *fourth chapter*. Critical analysis of existing policy documents related to organic agriculture including gaps in the documents is presented in the final *chapter* with a few recommendations.

2. Agriculture in Nepal

2.1. Traditional Agriculture

Over centuries Nepalese farmers have been practicing traditional agriculture, which ignore the use of chemical fertilizers and pesticides, and emphasize the use of local resources in crop production through integrating crops and livestock. In most of the family farm, the shed-house was accompanied by at least a few pair of goats and chickens, a pair of bullock, few cows or buffalos and others. The organic manure that generated from the shed-house was incorporated to the crop field. In general, field residues were either incorporated into soil, or fed to livestock. This closed-type of nutrient cycling within the farm was evident in Nepal. Still such practices are found in many areas located remotely. Crop yields in agricultural systems depended on internal resources, recycling of organic matter, built-in biological control mechanisms and rainfall patterns. At present, it is estimated that about 800,000 ha (26% of total) of agricultural land is by default free from synthetic fertilizers and pesticides. This is a favorable environment for transforming the traditional agriculture into organic agriculture in Nepal. And increased global and national demand for organic products, coupled with its role in the conservation of biodiversity in agro-ecosystems illustrates the significant scope and importance of organic agriculture for Nepal. Great possibility of organic farming exists because much of the rural lands are 'uncontaminated' by the synthetic fertilizers and pesticides.

2.2. The 'Green Revolution Agriculture'

Until about four-decades ago, agricultural yields were modest, but stable. Diversifying crops, rotating legumes, fully family managed, and linking the agriculture systems with ecology safeguarded production. But, when modern agriculture progressed at around 1950s after the innovation of dichlorodiphenyltrichloroethane (DDT), the ecological farming linkage was often broken because agricultural innovation has been driven mainly by an emphasis on high yields and farm profit. As a result, there were remarkable returns (yield increase) but also an array of negative ecological, economical, and social problems. In fact, it revolutionised food production in parts of the world. It is a paradigm shift in terms of inputs use, such as synthetic chemical fertilizers, pesticides, genetically modified organisms, mechanization, and irrigation water and so on for the production of high yielding varieties. In 1970, an American botanist, Norman Borlaug, was awarded the Nobel Peace Prize for having set in motion a worldwide agricultural development – particularly 'miracle wheat' that doubled or tripled the yield in some part of the world. Now a number of terminologies are used for indicating such types of agriculture: "green revolution agriculture", "industrial agriculture", "conventional agriculture", "commercial agriculture", and "intensified agriculture" as so on. In such types, it is believed that the benefits of these technological changes in terms of increased yield far outweigh their negative impact on human health and the environment. However, Rachel Carson's revolutionary book the "Silent Spring" made people aware of the negative effects of the industrial agriculture. In fact, the book "touched off the debate on the use of chemical pesticides, the responsibility of science, and the limitations of the technological progress" (Lear 2002).

It is now universally believed that the use of chemical fertilizers and chemical pesticides in crop cultivation has two main effects. The first is an income gain by increased crop yield and the second is the negative ecological disturbance and human health degradation. Evidence also shows that prevailing policies have led to this environmental crisis by favoring large farm size, specialized

production, crop monocultures and mechanization. As a result, the assemblages of farm components are broken, nutrient and energy cycles are more open, pest outbreaks occurs often, plants becomes more susceptible to pests, insects are often develop resistant to pesticides, and so on. Altieri and Nicholls (2005) grouped these negative ecological disturbances into two categories:

i. Diseases of the ecotope (physical environment): It includes erosion, loss of soil fertility, depletion of nutrient reserves, salinization and alkalization, pollution of water systems, loss of fertile croplands to urban development, and
ii. Diseases of the biocoenosis (biotic community): It includes loss of crop, wild plant, and animal genetic resources, elimination of natural enemies, pest resurgence and genetic resistance to pesticides, chemical contamination, and destruction of natural control mechanisms.

At present, many scholars argue that to manage the said ecological disturbance, an increase in the external costs is required, if accounted for this investment into benefit cost analysis; the amount to produce a desired yield surpasses the harvested yield. Taking an example of pesticide use in vegetable crop production in Nepal, Atreya et al. (2012) showed the relationship between environmental degradation and how farmers are marginalized. These farmers are 'forced' to bear the external costs of health environmental degradation and ultimately these are marginalized because of reduced health productivity, economic loss and changing social behaviors. External costs of pollution caused by the industrial agriculture must be taken care of while designing policy and plans. The industrial agriculture crossed the limits of the earth production potential, it is un-sustainable and cannot feed the growing population in a long-term; therefore, a new paradigm in agricultural revolution emerged, that strongly considers the relationships among agriculture, natural resources, and economic yield; that has been popularizing as "sustainable agriculture".

2.3. Sustainable Agriculture: A Paradigm Shift

We discuss here the paradigm shift of agriculture and further explore a few farming approaches such as organic agriculture and ecosystem-based commercial agriculture (ECA) to strengthen sustainable agriculture paradigm. Now we are at the era of sustainable agriculture - a completely new paradigm. A paradigm is the scientific understanding to an entire approach of a field. It includes a worldview, a way of understanding how we can go about learning about things, and the consequent methods we use. The world views sustainable agriculture as the production system that secures food self-sufficiency by conserving/enhancing the natural resource base and ensuring social equity and economic viability.

Until the era of industrial agriculture, each scientist was working with its own defined field not interested or willing to see how things interacted. These scientists were working independently. For example, agronomist, edaphologist, crop protectionist, ecologist, and economist focused their research on a single indicator of agriculture – crop yield per unit area. However, heavy use of chemical fertilizer and pesticides was one example where exogenous effects forced some scientists to begin to look beyond the boundaries of their own mono-disciplinary to try to understand what they were seeing and experiencing in the yield, soil ecology, crop ecology, and society. These people were faced with trying to find new ways of thinking and new methodological approaches to gain a better understanding of the world they had come to see. Finally, a new paradigm of sustainable agriculture was emerged. The sustainable agriculture paradigm adopts interdisciplinary approach of study, is

able to take solve a number of issues of mono-disciplinary as being a new paradigm. It not only accounts positive (yield) but also the negative effects of industrial agriculture (short- and long-run) and the multiple interacting factors in the environment, including the people, soil, crops, surface and ground water, and, micro- as well as macro-flora and fauna - making a complete agro-ecosystem approach, which is the fundamental basis for sustainable agriculture. The UN FAO report, "Wake up before it is too late" (UN 2013) recently called for paradigm shift in growing our food, away from input-intensive, industrial agriculture towards the more sustainable, highly regenerative and productive "ecological intensification".

Figure 1 helps to perceive changing knowledge of understanding on the agriculture system over time. Its interpretation with time depends on the analytical framework of the scientific communities. The different scientific methods (A_1, A_2, …A_n) can be used to achieve a paradigm (A). The initial "traditional agriculture" was replaced by the "industrial agriculture" which again was replaced by the "sustainable agriculture", resulting in the stepwise development of the agriculture science. The methods set "C" can be considered to be the best based on the current 'mind', but is not the absolute truth regarding agriculture because the 'future mind' could interpret facts based on different framework. But it is certain that the more we move towards achieving agriculture sustainability, the development of world agricultural knowledge becomes more interconnectedness, complex and results in a situation of turmoil. That may cause the sustainable agriculture paradigm unsustainable, and the new paradigm shift occurs. For the knowledge base development of organic agriculture, importance of farmers and producers could not be undervalued. Both scientific community and local level farmers community are equally important in the scientific development of organic agriculture.

Here we want to clarify 'method' within a paradigm. A method is an established scientific knowledge within a paradigm, which helps to achieve the goal of the paradigm. For example, the use of pesticides, synthetic fertilizers, high yielding varieties, irrigation water, genetically modified organisms, and so on are the methods applied for achieving the goal of industrial agriculture. Similarly, scientific communities have discovered such method for sustainable agriculture too. These are, for example, organic farming, agro-forestry, integrated pest management farming, permaculture, conservation agriculture and so on. Simply put, a method could be either a model, or a hypothesis, or a system, or an alternative – but it should aim to achieve a particular paradigm's goal.

Particularly in Nepal, development of or introduction of methods like integrated pest management (IPM), integrated crop management (ICM), integrated plant nutrient management system (IPNS), organic farming, agroforestry, sustainable rice intensification, etc. have, to some extent tried to minimize their respective problems by addressing both a social and ecological approach. These concepts are intended to identify optimum levels of fertilizer and pesticide usage with respect to human society as a whole. Recently, acknowledging the potential scope of organic agriculture, and visualizing the future potential of Nepalese landscape ecology and social cohesion; ANSAB (Asia Network for Sustainable Agriculture and Bioresources) has come up with a new method to support 'sustainable agriculture' popularized as "Ecosystem-based commercial agriculture (ECA)". At present, many scientists and some organizations are working within 'sustainable agriculture' paradigm of scientific revolution of agriculture; and these people including ANSAB are searching for the best method within the recent paradigm[1].

[1] http://www.ansab.org/featured-ntfps/ecosystem-based-commercial-agriculture/

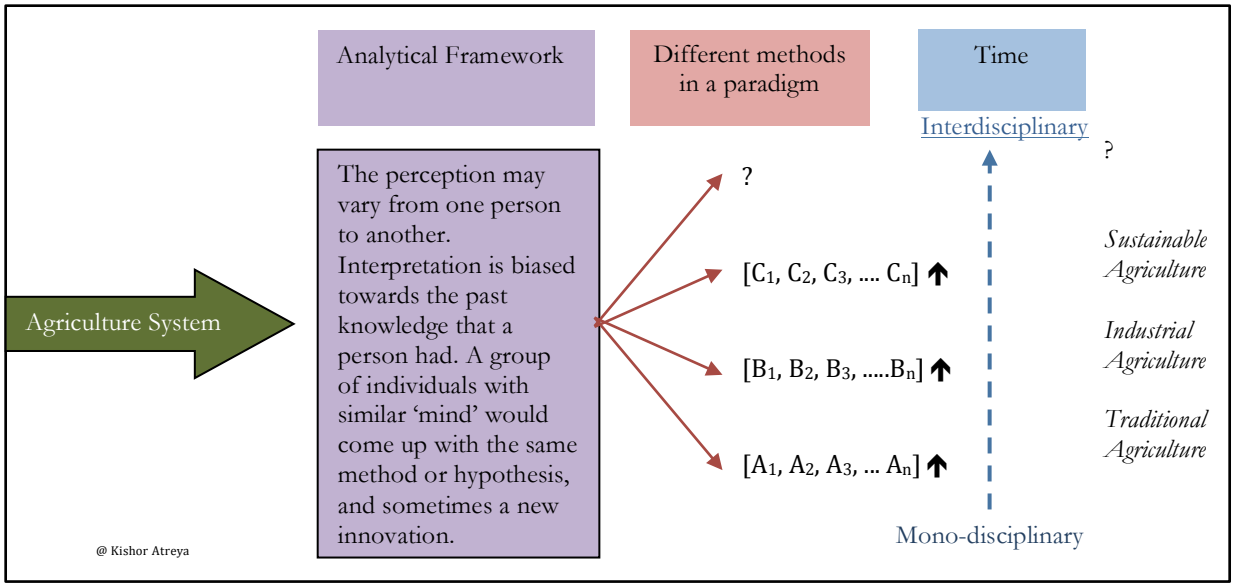

Figure 1. Interpretations of agriculture system depend on the analytical framework of an individual and over time changing from mono-disciplinary to interdisciplinary sciences

2.4. In Search of 'the best' Agriculture

At present, many scientists and developmental organizations understand that neither the ancient agriculture, nor the traditional agriculture could feed the growing population; and the present conventional or commercial or industrial agriculture heavily depends on chemicals – that resulted in many ecological disturbances and health hazards– which human civilization cannot afford if unchanged. Many believe that it is the right time for action before irreversible damage happened. This leads to the emergence of 'sustainable agriculture' paradigm. However, the term 'sustainable' itself is not free from controversy because of its vagueness, clearness, and measurability (Petersen and Snapp 2015). The practical issue of sustainability paradigm is that it does not say the way to achieve its goal, for example, what techniques can be deployed to get the 'end product' of sustainability. This resulted in an innovation of 'the best' agricultural production systems. Accordingly a bombarding numbers of agriculture production systems evolved, with comparatively well-defined characteristics, boundaries, and innovations (Box 2). Neither one are accepted unequivocally as 'the best' – instead each one defined what the 'best' means. These methods differ especially in the way they see (i) the impacts of environment on agriculture, (ii) the impacts of agriculture on environment and (iii) the ways natural elements are linked to agriculture and vice versa. It is a result of competition between 'input technologies' and 'process technologies'. Many of these innovative agricultural systems are context-specific, ecosystem-specific, and accordingly remarkable changes in the technological and institutional development are noticed.

Box 2
The evolution of agricultural production system

1. **Ancient Agriculture**
2. **Traditional Agriculture**
3. **Conventional Agriculture**
4. **Commercial Agriculture**
5. **Industrial Agriculture**
6. **Intensified Agriculture**
7. **IPM Farming**
8. **Low External Input Agriculture**
9. **Conservation Agriculture**
10. **Integrated Farming**
11. **Resource Conserving Agriculture**
12. **Climate Smart Agriculture**
13. **Civic Agriculture**
14. Community supported Agriculture
15. Ecological Intensification of Agriculture
16. Landscape Farming
17. Biodynamic Farming
18. Eco-Agriculture
19. Permaculture
20. Nature Farming
21. Vedic Agriculture
22. Organic Farming
23. Beyond Organic Growing System
24. Bio-Intensive Farming
25. Regenerative Agriculture
26. Ecosystem-based Commercial Agriculture

Of the many alternative approaches under sustainable agriculture, organic agriculture is well accepted by people in terms of area coverage, technological and institutional development, and environmental conservation. At present in global scale, more than 43 million hectares of agricultural land (1% of the total agricultural land) over 170 countries are certified as 'organic' with two million producers and US $72 billion market size. The world market is increasing, because of its philosophical, environmental and food safety concerns. It is a kind of ecological farming, where the field is seen as a laboratory for ecological innovations, and the producers/farmers constantly try, fail, learn and retry for the innovation with long-suffering associated risks and costs (Tittonell 2014). Rodale (2010) strongly pointed out that "chemical paradigm is about controlling nature, the organic paradigm is about respecting nature". However, it is not necessary always that organic agriculture is sustainable and free from problems. Yield per unit area is comparatively less (10-20%) than conventional system. Therefore, ANSAB has proposed a new method of agriculture specific to Nepal or similar biophysical and socio-economic context, the ECA.

2.5. Ecosystem-based Commercial Agriculture

In Nepal, agriculture sector dominates the economy providing about 35% of the GDP and absorbs about 75% of country's labor force. The farm production system in Nepal is highly integrated, interlinked and is characterized by subsistence form as majority of the farming community have very small landholdings of less than 0.5 ha. The recent declines in agricultural production have depressed rural economies and increased widespread hunger and urban migration. Nepal is a severely food deficit country as two out of every three Nepalese suffer from food insecurity. Poverty has largely remained an agriculture phenomenon in Nepal because it is the livelihood dependency source of the poor.

In response, commercialization of the agriculture sector has been identified as an option. It is a priority agenda in the government policy, but it is not systematically mainstreamed in agriculture development planning, programming and fiscal budgeting. Recently, some policies and implementation guidelines for agriculture commercialization and agribusiness promotion have been developed, but deficiency has been observed at a practical level. It does not provide sufficient

support to the investments of the private sectors including the banks and financial institutions. The investments of the commercial banks and other financial institutions on agriculture are limited to two per cent of their total lending.

Past programs and projects implemented by the government and development agencies were primarily focused on production without considering the markets, let alone the entire value chain. Due to the lack of a reliable value chain, smallholder farmers are facing difficulty to access the markets and lack knowledge on market characteristics like type of buyers, quality, quantity and price. Most of the programs and projects largely follow the approach of agriculture intensification with the use of modern varieties and agro-chemicals, and none of the projects are considering the impact on people's health and environmental consequences due to use of agrochemicals.

The negative impact of this approach in the form of environmental pollution, degradation of ecosystems, health hazards and loss of biodiversity started to become evident. This has also created a barrier of entry to the international niche markets due to quality control and food safety issues in the importing countries. Moreover, climate change has worsened the situation with increasingly changing monsoonal patterns, warming temperature, prolonged droughts and floods that has made the country more prone to natural disasters and greater risk of food insecurity. Communities are already facing the impacts of climate change, for example they have limited options for coping with adverse weather conditions. Therefore, commercialization of agriculture needs to be redesigned to ensure that it does not have any adverse effect on the ecosystem function and that the resultant economic benefit is sustainable in the long term.

Nepal has a comparative advantage in developing sustainable agriculture and many good practices that are scattered across the nation can be witnessed, but efforts are still lacking to consolidate these good practices into a viable system of value chain. There is no any appropriate agribusiness model to apply under such situation. The sector is still mainly dominated by subsistence farming, traditional farming practices, land fragmentation, and low level of knowledge and suffers with low productivity and production. The sector is struggling to catch up with rapid changes in terms of new technologies, viable products, emerging markets and business possibilities. There is a widespread negative perception among the local people towards farming as menial, tedious and an un-prestigious employment partially due to small remuneration and the use of traditional farming practices. These factors have led the rural people, especially youths, to migrate to urban areas and abroad in search of better livelihood opportunities and higher incomes. Over the last decade, the youth migration from rural areas for employment has been increasing. Approximately every day more than 1,000 youths leave for foreign jobs and often leave their children and elderly family behind. This has been negatively affecting the adoption of technologies, which would increase production and the success of rural entrepreneurial activities.

In order to tap the huge potential that exist in Nepal's agriculture sector and address the challenges of resource degradation, fragmented land holdings, erratic climate systems, poor market linkages and labor shortages, ANSAB envisioned Ecosystem-based Commercial Agriculture (ECA), which aims to transform the traditional forestry and agriculture into climate smart, attractive and socially prestigious business.

ANSAB in partnership with IIED carried out a study in 2013 to prioritize the farm-forest enterprise options in Nepal for economic growth, social justice and ecological resilience. The study evaluated organic vegetable following ecosystem based commercial agriculture practice as one of the two important options through brief assessment of the existing farm-forest enterprise options in Nepal mid hills and detailed assessment of the economic prospect of 13 sub sectors. Based on likely

impacts against seven impact criteria: (i) income-generating potential; (ii) gender balance in such income generation; (iii) contribution to food security; (iv) contribution to energy security; (v) contribution to climate change mitigation and adaptation; (vi) biodiversity; and (vii) capacity to improve soil fertility without chemical nitrogen inputs, ecosystem based farming practice was found to produce economic growth, social justice and ecological resilience in the country (http://pubs.iied.org/pdfs/13572IIED.pdf).

The concept of ECA was shared with various stakeholders through workshops and interaction. A National Workshop on Ecosystem-based Commercial Agriculture in Nepal was organized by ANSAB in Kathmandu May 09, 2014 where there was multi-stakeholders participation incl. Ministry and Department of Agriculture, research institutions (NARC, IRRI), academic institutions, civil society organizations, INGOs and private sector. From the workshop a taskforce comprising representatives from the government, private sector, university and civil society for ECA has been developed. The workshop participants felt the need of such type of agriculture in Nepal and well accepted the concept.

Similarly other two events were organized in the partnership of HIPAT monthly magazine where ECA concept was shared and discussed. A paper on "Commercializing Sustainable Agriculture in Nepal: Prospects for Growth & Competitiveness" was presented in the workshop "Cooperatives in Agricultural Production & Commercialization on December 12, 2013 in Kathmandu. Further a paper on Sustainable Agriculture in Nepal: Prospects for Economic Growth & Competitiveness was presented in the workshop on "Political Commitment for Sustainable Agriculture Development – Path Forward" in April 05, 2014 in Kathmandu. In the workshop, there was participation of representatives and member of parliaments of each of the major political parties, high-level government officials including secretary from Ministry of Agricultural Development and Governor of Nepal Rastra Bank, research, academic institutions and private sector. There was in-depth discussion on sustainable agriculture in general and ECA in particular. Most of the participants have favored the need of ECA as an alternative to the existing agriculture.

The ECA is based on the principles of (i) landscape ecology, (ii) agro-ecology, (iii) social cohesion, and (iv) agribusiness entrepreneurship - for the "structural transformation on economic growth taking account of environment sustainability, social justice and equity and economic efficiency". The ECA not only accepts the philosophy of organic agriculture (prohibits use of chemical pesticides, synthetic fertilizers, antibiotics, GMOs, and so on) but also considers human needs of increased production with conserving/enhancing environmental resource-base of the agro-landscape.

2.5.1. Principle of Landscape Ecology

Landscapes are living systems with (i) spatial pattern or arrangement of landscape elements (*landscape structure*), (ii) movement and flows of animals, plants, water, wind, materials and energy (*landscape function*) and (iii) dynamics of spatial pattern and function over time (*landscape change*). The landscaping agriculture not only makes it self-reliant on the nutrient requirement of the agro-ecosystem, but also helps extra income from producing non-food environmental goods and services (e.g., forest resources, biodiversity, wildlife, recreation and scenery etc.). The UNESCO defines "agricultural landscapes are a testimony to humanity's long interaction with the land, often unique examples of people and nature coexisting and influencing each other. They demonstrate a rich cultural and landscape diversity, sustainable land-use systems and in some cases people's daily struggle for

survival under extreme climatic and environmental conditions".[2]

2.5.2. Principle of Agro-ecology

Agro-ecology is a scientific discipline, an agricultural practice, and a social/political movement initially primarily dealt with aspects of crop production and crop protection; however, recently a new dimension of 'ecology of entire food system' has emerged. The agro-ecology now accounts of ecological, economic and social dimension of agricultural systems - from 'farm to plate'. Therefore, it investigates field and plot levels, agro-ecosystem and farms levels as well as whole food system. It goes beyond a one-dimensional view of agro-ecosystems - such as genetics, agronomy, soil, and so on - to understand the ecological and social levels of structure and function in the agro-ecosystem. Instead of focusing on one particular component of the agro-ecosystem, it emphasizes the interrelatedness of all agro-ecosystem components and the complex dynamics of ecological processes.

2.5.3. Principle of Social Cohesion

The social cohesion is defined as the willingness of individuals of a society to cooperate with each other to survive and prosper; and the elements of it includes *social inclusion*, *social capital* and *social mobility.*[3] The European Council 2004 defines, as "social cohesion is the capacity of a society to ensure the welfare of all its members, minimizing disparities and avoiding polarization. A cohesive society is a mutually supportive community of free individuals pursuing these common goals by democratic means".[4] It is a realization of empirical evidence that social capital can contribute significantly to sustainable development. Use of farmers groups, cooperatives, local organizations, and their unbiased participation are necessary for better understanding production constraints and institutional and technological innovation. Further, the ECA helps to minimize 'distancing' between consumer and producers through close partnerships between them. Thus benefit distribution along the value chain; equity and social justice have been given priority. Social cohesion can only be achieved through a fair and equitable benefit sharing.

2.5.4. Principle of Agribusiness Entrepreneurship

Nepalese people perceive traditional agribusiness as a low-level job, less prestigious, and less economical attractive. Therefore, the ECA takes care of this limitation. It tries to transfer traditional agriculture into ecologically sustainable, economically attractive and socially prestigious business. A farmer must know the cost and benefit of production systems, as well as economic and business strategies involved in the sale and supply, and marketing of agricultural products he produced. Key concepts and skills relevant to market structure; legal and institutional obligation such as labor, product specification and certifications; business plan to accommodate complete value chains; and social entrepreneurship and social innovation are the basic principles of agribusiness entrepreneurship. In this business model, ECA emphasizes local communities need of private partnership for capital, technology and market, whereas local communities participate in the business with their land and labor. This type of arrangement can be called as Community-based Capitalism.

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[2] http://whc.unesco.org/en/review/69/

[3] http://www.wikiprogress.org/index.php/Social_cohesion

[4] http://www.coe.int/t/dg3/socialpolicies/socialcohesiondev/source/RevisedStrategy_en.pdf.

So far the paper discussed on the agricultural shift towards sustainability; and a few methods that can be used to achieve the goal of sustainability. Organic agriculture is the mostly accepted but a few limitations exist. To overcome the limitations of the organic agriculture, ANSAB proposed the ECA. Now the next heading concentrates on how to convert either traditional or industrial agriculture into ECA.

2.6. Converting to Ecosystem-based Commercial Agriculture

Over the past decades, agriculture was more focused on yield element and farm profits, but it resulted to many ecological, social and human health problems. Consequently, significant numbers of alternatives to industrial agriculture has been proposed, and the ECA is one of them, mainly for Nepal. But we have the ECA yet at experimentation and demonstration station and some of the components are replicated to few areas. For many farmers, who have been practicing high chemical input-based agriculture, rapid adoption of the ECA is neither possible nor practical. The conversion efforts proceed in slower steps towards the goal of sustainability. Here we have proposed a total of five conversion steps, which are given in the book entitled "Agroecology: The Ecology of Sustainable Food Systems" (Gliessman 2015). All these levels outline stepwise, evolutionary conversion process for the entire food system.

i. **Level 1:** At this level, focus is to increase the efficiency of industrial/conventional practices in order to reduce the use and consumption of costly, scarce or environmentally damaging inputs. It is the primary emphasis of much conventional agricultural research. Example includes optimal crop spacing and density, improved pest monitoring, timing of sowing, optimal fertilizer and water management, etc.

ii. **Level 2:** Now substitute alternative practices for industrial/conventional inputs and practices. The goal is to replace resource-intensive and environmental-degrading products and practices with those that are more environmental benign. Example includes use of nitrogen fixing, cover crops and rotations to replace synthetic N, the use of biological control agents to replace pesticides, shift to minimum tillage. The basic agro-ecosystem structure is not greatly altered. Many of the same problems of conventional systems also occur at the Level 2.

iii. **Level 3:** Redesign the agro-ecosystem so that it functions on the basis of a new set of ecological processes. The fundamental changes in overall system design eliminate the root causes of many of the problems that still exist at Levels 1 and 2. The problems of the Levels 1 and 2 are prevented from arising in the first place. It based on agro-ecosystem structure and functions for the understanding of yield-limiting factors. Problems are recognized, and prevented by internal site- and time-specific design and management approaches, instead of by the application of external inputs. An example includes diversification of farm structure and management through the use of rotations, multiple cropping and agroforestry.

iv. **Level 4:** Reestablish a more direct connection between those who grow the food and those who consume it. Conversion in the cultural and economic context is sought. At a local level, consumer value locally grown food and support farmers who are striving to move through Level 1-3, changing a kind of 'food citizenship' - a force for food-system change. The rate of

this transformation determines the new culture and economy of sustainability, which is the prerequisite for reaching Level 5.

v. **Level 5:** A new global food system, based on equity, participation and justice, that is not only sustainable but also helps restore and protect earth's life-support systems. Based on the foundation created by the sustainable farm-scale agro-ecosystems (Level 3) and the sustainable food relationships among producers and consumers (Level 4), the Level 5 entails change that is global in scope and reaches so deeply into the nature of human civilization.

Figure 2 describes the world research level and Nepal's condition in the level of conversion and transformation at present. Much practical research outputs and technologies are available at the Level 1, and Level 2 for people of developed world. Conversion to Level 3 from the previous one can be seen in some developed countries. And there are very few instances that show Level 4, and Level 5 stages of conversion. The world society is heading onwards!

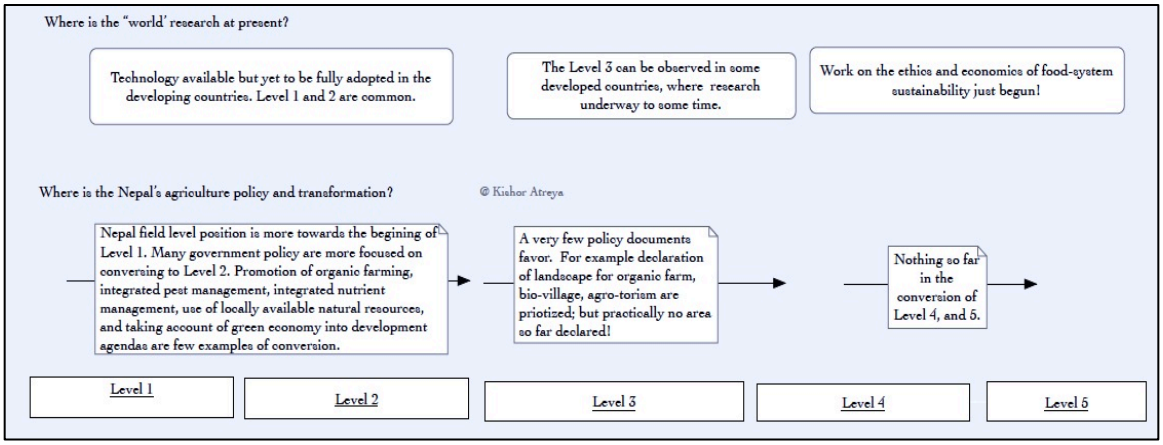

Figure 2. Levels of conversion in the agricultural sustainability of the World and Nepal

Based on these conversion levels, we can conclude that Nepalese agriculture is still at rudimentary stage. Much of the time we are struggling at the Level 1. But we have plenty of technologies that can make us easy in conversion of the Level 1 to Level 2; but we practice minimum. These are only concentrated in the research farms. However, a very few number of policy favors conversion up to the Level 3. Re-designing the agro-ecosystem, such as "landscape farming", "bio-village", and "agro-tourism" are mentioned in the policy documents. But it is yet to be implemented in the field.

3. History of Organic Agriculture

3.1. History of Organic Agriculture at global level

Before the innovation of chemical pesticides and synthetic fertilizers, agriculture was depended on organic materials as fertilizers and pesticides, and physical methods for weed control. Farmers of the past did not have to play with synthetic chemicals. True organic agriculture is practiced by intent, not by default, and one individual do not automatically qualify for organic simply because he never used prohibited chemicals. Today's organic farming, although uses a few similar methods as before; in fact, it is not the reversion of past practices, but rather it is 'an intensification of farming by biological and ecological means in contrast to chemical intensification by mineral fertilizers and synthetic pesticides' (Vogt 2007).

This makes it clear that organic agriculture started much more recently. It is hard to specify exactly when it begun; however, the series of lecture on agriculture by **Rudolf Steiner** (http://en.wikipedia.org/wiki/Rudolf_Steiner) in Koberwitz, Germany (now Kobierzyce, Poland) in 1924, and his publication "Spiritual Foundations for the Renewal of Agriculture" founded 'biodynamic agriculture' (see Figure 3). Steiner's lectures (http://www.rudolfsteineraudio.com/agriculture/agriculture.html) not only made aware of the danger of synthetic fertilizers (just appearing in his time), but also offered guidelines for organic farming practices, stressing the ideas of the farm as an self-sustaining organism, that thrives through crop diversity, the crop-livestock integration, and creating 'closed' nutrient cycling (Vogt 2007). Later in 1938, a student of Steiner, **Ehrenfried Pfeiffer** (http://en.wikipedia.org/wiki/Ehrenfried_Pfeiffer) unequivocally popularized the biodynamic agriculture in the book "Bio-Dynamic Farming and Gardening" which brought the practices, philosophy, and nomenclature of the 'alternative' agriculture to a worldwide audience.

A few American and British agricultural scientists also began for alternatives for their country's industrial farming when they observed contrasting practices on parts of Asia. In USA, the publication of **Franklin Hiram King** in 1911 "Farmers for Forty Centuries" (http://www.permaculturenews.org/files/farmers_of_forty_centuries.pdf) acknowledged the practices that had been applying to enhance soil fertility and soil conservation in China, Korea and Japan. In the UK, **Sir Albert Howard** (http://en.wikipedia.org/wiki/Albert_Howard), a mycologist (often referred as the father of modern organic agriculture) published several books and many articles at different time intervals. A few remarkable publications are: "The Waste Products of Agriculture" in 1931; "An Agricultural Testament" in 1940; and "The Soil and Health: A study of Organic Agriculture" in 1947. In his publications, he argued that healthy soils are the foundation for healthy plants and animals. During the same period, **Sir Robert McCarrison** worked to observe the relationship between agriculture and human health in India, and finally returned to England in 1935, inspired GT Wrench to write the book "The Wheel of Health" in 1938.

Inspired by the work of King, Howard, and McCarrision, **Lady Eve Balfour** (http://en.wikipedia.org/wiki/Lady_Eve_Balfour) established the first long-term comparison of organic and non-organic production experiment farm (the Haughley Experiment), and later in 1943 she wrote a book entitled "The Living Soil" (http://organiccollege.com/dl/file.php/1/the-living-soil.pdf) which highlighted the importance of soil biota on nutrient availability. It was **Lord Northbourne** (http://en.wikipedia.org/wiki/Walter_James,_4th_Baron_Northbourne) who coined the term 'organic farming' from the concept of 'farm as organism' and because of this he has the best claim to being the "father" of organic agriculture. In his book "Look to the Land," published in

1940, he exceptionally versioned a clash of worldviews between "organic versus chemical farming" and warned that it may last for generations (Paull 2014). This book provided a practical and philosophical underpinning for organic farming, slightly modified the view of Steiner and Pfeiffer to see further, and brought the concept of 'organic' to worldwide audience by presenting the 'biodynamic agriculture' as one way of practicing organics (Paull 2011).

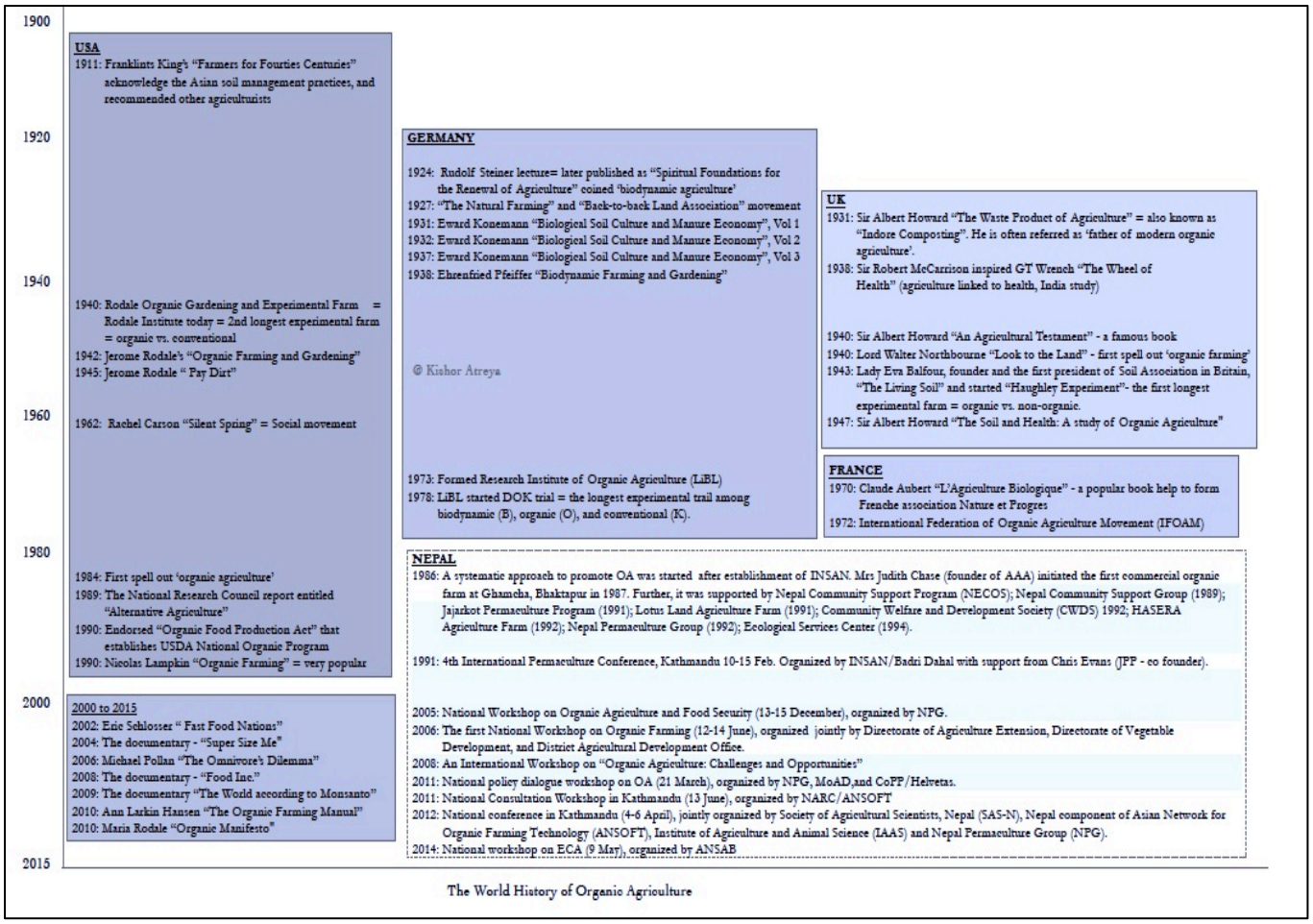

Figure 3. The history of World organic agriculture

In the US, **Jerome Irving Rodale** (http://en.wikipedia.org/wiki/J._I._Rodale) brought much of the work done in Europe and founded Rodale Inc. in 1930. He was the first person in the United States favoring sustainable agriculture and organic farming. As a result, he established Rodale Organic Gardening and Experimental Farm (the 2nd longest experimental farm between organic and conventional) in 1940; started publishing magazine entitled " Organic Farming and Gardening" starting in 1942 (until today known as Organic Gardening, but re-launched as Rodale's Organic Life in spring 2015); and published a book "Pay Dirt: Farming and Gardening with Compost" in 1945. During 1960s, when the book "Silent Spring" was published, it caused a significant social movement towards organic, and against the use of chemical pesticides – ultimately leading to the ban on DDT in the US in 1972.

The work on organic farming done in Germany and Britain had influenced in France in the early 1970s. In 1970, **Claude Aubert** wrote a popular book entitled "L' Agriculture Biologique" that helped to the formation of the French association called – Nature et Progres – which led to the

foundation of International Federation of Organic Agriculture Movement (IFOAM) in 1972. The IFOAM is now an important global network promoting organic farming practices around the world, and setting basic global standards for organic agriculture (http://www.ifoam.bio/en/about-us).

In 1973, the Research Institute of Organic Agriculture (FiBL – German initials) was founded. It is the largest research institution on organic agriculture, which initiated BOK trial in 1978. It is the longest experimental trial among biodynamic (B), organic (O), and conventional (K) agriculture.

During 1970s, despite significant work by IFOAM, FiBL, and Rodale Institution; organic agriculture was still perceived as a radical movement. Until 1980, the USDA did not acknowledge organic farming in its policy documents. However, in 1989, the National Research Council report entitled "Alternative Agriculture" acknowledged the importance of alternative farming systems such as organic farms. The organic movement in the US was further strengthen after the publication of popular book "Organic Farming" by **Nicolas Lampkin**; and the endorsement of Organic Food Production Act 1990, that established USDA National Organic Program.

There have been a significant number of publications, documentary films and training manuals that helped to move organic farming even these days. Widely read books such as Eric Schlosser's "Fast Food Nations"; Michael Pollan's "The Omnivores Dilemma"; Ann Larkin Hansen's "The Organic Farming Manual" and Maria Rodale's "Organic Manifesto" have dramatically popularized organic farming movement all over the world. Also a few documentary films such as "Super Size Me 2004"; "Food Inc. 2008" and "the World according to Monsanto" have increased awareness of processed foods and the industrial corporate control in the existing food systems.

3.2. History of Organic Agriculture in Nepal

The organic agriculture movement in Nepal was first observed when it was at infancy stage in the US policy level. The US National Research Council accepted the philosophy of organic agriculture, and put forward it as "Alternative Agriculture" only in 1989. During 1980s, an American research scholar Miss Judith Chase[5] came to Nepal and interested to escape life in the city. She moved to Gamcha village, Dadhikot, Bhaktapur district in 1987 and started a small 'organic garden' at first, but immediately envisioned a commercial organic farm. In the same year, she founded Appropriate Agricultural Alternatives (AAA), an NGO devoted to the promotion, research, advocacy and marketing of the organic agriculture in Nepal. She is the pioneer of organic farming in Nepal; local

[5] *An interview with Judith Chase* - She first came to Nepal in 1974 with eight friends and stayed for five months. During her stay, she had been to Langtang, Solukhumbhu, and Ghandruk trekking. She observed local's livelihood very closely and fascinated with their indigenous knowledge of preparing *doko, mandro*, umbrella made of bamboo and leaves, etc. Again she came to Nepal in 1976 as a Researcher in Fine Arts. She visited many places, preferably remote village, and decided to stay out of Kathmandu life. Finally, in 1987 she moved to Ghamcha, Bhaktapur. In the same year her friend brought seeds of vegetables from Italy in the way to Mt. Kailash. In 1987, she established AAA and an organic farm and planted those seeds. This is the first step of the organic agriculture movement in Nepal. She was inspired for organic agriculture by Rodale's publications, "Return to the Earth Movement" in the US, and Howard's book "Agriculture Testament". At the beginning, AAA supplied organic vegetables to a restaurant, 'Mike's Breakfast', located nearby Yak & Yeti Hotel, Darbar Marg. At that time, farmers in Kathmandu valley used to wash vegetables in Bagmati River which when noticed by tourists, they attracted towards AAA products. The demand was increased. So in 1992, AAA talked to Summit Hotel and established 'organic market' inside its periphery twice a week. This strategy was extremely successful, so decided to do business from organic agriculture. Then, she started training to local villagers, invited many locals in her farm, and did experiments with 'organic' versus 'local' way of cultivating vegetables. At first villagers were reluctant, but when they saw price premium, villagers accepted the organic approach. Now the Gamchha area is renowned as 'organic village' in Kathmandu valley. She said that, probably she had introduced the term 'organic agriculture' in Nepalese market for the very first time; which Nepalese farmers have been practicing such approach since ancient time. In 1995, she went back to US. However, she returned to Nepal in 2010 and established "Everything Organic Pvt. Ltd." in Kavre district and now promoting "Nepali bio-intensive farming". This time, she was inspired by the book "How to grow more vegetables" written by John Jeavons. She is unaware of Nepal's policy related to organic agriculture. But when asked why her farm is not certified so far, she provided two reasons: the first is that, "certification is all about trust between consumer and producer, and I think everybody believe me"; and second, she said "certification costs is too high". She believes that government priority on the IPM is the first step towards eliminating pesticides. Ultimately, the term 'IPM" will change to Organic Pest Management (OPM).

farmers occasional referred her "mother of Nepal's organic farming" (Bisht 2011). She cautiously accepted her leading role in the movement of organic agriculture in Nepal, by saying "probably I had introduced the term organic agriculture in Nepalese market for the very first time; which Nepalese farmers have been practicing such approach since ancient time."

The movement of organic agriculture in Nepal would be incomplete unless it accounts the history of permaculture. The permaculture history in Nepal dates back to 1986, when Institute for Sustainable Agriculture Nepal (INSAN - headed by Badri Dahal) initiated permaculture design courses in collaboration with the Agricultural Project Services (APROSC – now defunct) and Winrock International - and that training was facilitated by Bill Mollison (Malla 1997) (http://permaculturewest.org.au/ipc6/ch06/malla/index.html).

Mr. Bill Mollison (http://en.wikipedia.org/wiki/Bill_Mollison) an Australian scientist has been referred as the 'father of permaculture'. Although, there is hardly philosophical difference between permaculture and organic farming; but in practice, however, people perceive permaculture as 'natural farming' and organic as 'no use of chemicals'. Permaculture accounts 'system approach' and encompasses much more than just organic, whereas organic grew more on research, institutional development, and market share. It is a kind of '*market-driven family farming*' versus '*family-driven natural farming*'. Despite many similarities, the main difference between these two is that "permaculture is cent percent organic but organic farming may not necessarily be cent percent permaculture".

The INSAN is regarded as on of the pioneer organization that worked under the philosophy of permaculture and ecological agriculture since its establishment in 1986; however this organization did not coined the term 'organic farming'. This credit goes to Judith. Because the AAA was providing training courses on 'organic farming and sustainable agriculture' at the time when others providing trainings on 'permaculture' (Malla 1997). During early 1990s, a few non-governmental organizations such as Nepal Community Support Program (NECOS – est. 1989), The Lotus Land Agriculture Farm (est. 1991), Jajarkot Permaculture Program (JPP – est. 1991), Community Welfare and Development Society (CWDS – est. 1992), Hasera Agriculture Research and Training Center (est. 1992), and Ecological Service Centers (est. 1994) promoted organic agriculture in Nepal. See Figure 4 for details.

In 1992 a milestone happened in the organic agriculture movement: Nepal Permaculture Group (NPG) (http://npg.org.np) was established. It started networking among organizations and individuals dedicated to sustainable agriculture, organic agriculture and permaculture. It is a member of 'IFOAM – Organics International'[6]. The NGOs and individuals working independently on the organic agriculture at that time were organized. Therefore, it acts as an umbrella organization, disseminate the philosophy and principles of permaculture - and has currently 19 organizational members and more than 1200 trained-individual members[7] - all advocating for policy formulation, research and trainings, and partnerships with government and international organizations. Also it has been playing a leading role in the organic agriculture movement in Nepal - especially on production and marketing systems through policy dialogue that resulted National Guidelines on organic agriculture. Its working priority areas are permaculture, **organic agriculture**, biodiversity, food

[6] As of January 2015, there are additional three organizations of Nepal listed as the member of IFOAM. These are: (1) CoPP/Helvetas; (2) One World – A Learning Center Pvt. Ltd.; and (3) Society for Environment Conservation and Agricultural Research and Development - SECARD Nepal). Please be aware that membership in 'IFOAM – Organic International' is different from IFOAM Accreditation (IFOAM –Organics International 2015).

[7] Mr. Tanka Upreti, Head of Secretariat, NPG; personal communication, 27 May 2015

security and climate change. It offers trainings on introductory and advance permaculture design courses, on organic agriculture and on sustainable agriculture. NPG has so far organized four national workshops on the organic agriculture (2005, 2006, 2011, and 2012) and one international workshop in 2008 (see Figure 3 and Figure 4). Also member organization of the NPG regularly organized different types of training on permaculture design course, sustainable agriculture, and organic agriculture.

It seems that organic agriculture movement in Nepal was 'hidden' into the permaculture philosophy after NPG's establishment until 2002. During mid 1990s, there were less number of organizations unequivocally working in the field of organic agriculture; however a significant growth of NGOs and individuals working under the permaculture philosophy was observed. Even the national level agricultural policy documents did not support organic agriculture in that period[8]. The *Agricultural Perspective Plan 1995* (APP) favored heavy use of synthetic fertilizers and chemical pesticides. The *9th Five-Year Plan* (1997-2001) emphasized balanced application of chemical fertilizer and organic manures for the optimal crop yield. Both Plans were aware of the negative impacts of chemicals, and promoted integrated pest management (IPM) and integrated plant nutrient management system (IPNMS). However, the one significant positive impact of the movement was that, the curriculum board of the Tribhuvan University endorsed a BSc (Agriculture) course - "Farming System and Sustainable Agriculture" under Institute of Agriculture and Animal Science in 1996.

The *10th Five-Year Plan* (2002-2007) used the term 'organic farming' as a means of reducing chemical pesticide use; but the Plan was more focused on agriculture commercialization and diversification with heavy use of chemical inputs, therefore, impact of organic agriculture movement at policy level was minimal but significant (first spell out in the policy document). The 10th Plan promoted IPM and IPNMS as the mean of reducing pesticide use and increasing soil fertility, respectively. In 2002, the *National Fertilizer Policy* came into effect, which favored balanced use of organic and inorganic fertilizers. The *National Coffee Policy 2003* envisioned organic coffee possibility in Nepal, therefore it proposed development of organic coffee with a national logo; but the eternal intuition of the policy was to generate income rather than environmental care and fairness. The most commendable policy that still influencing organic agriculture is the *National Agricultural Policy 2004*. This policy encouraged organic farming and provided support for the certification and accreditation. Similarly, the *Agribusiness Policy 2006* also proposed to demarcate organic/pesticides-free production area. The *Biosafety Guidelines 2005* provides a guidance on the control on GMOs in Nepal, and release of GMOs into the market is prohibited unless the health and environmental risk assessment shows positive.

It took nearly 19 years to arrange a national level workshop on organic agriculture from the 'birth' of it in Nepal. The Government of Nepal organized the so-called 'first' national workshop on organic farming during 12-13 June 2006. A total of 21 papers within six thematic areas related to organic farming were presented on the second workshop. More than 125 experts from different sectors of Nepal (farmers representatives, traders, processors, NGOs, INGOs, CBOs, planners, researchers and extension workers) participated in the workshop. The Director General, Department of Agriculture chaired the committee and the Secretary, Ministry of Agriculture Development inaugurated the workshop. The workshop was focused on: (i) concept, status and opportunity of organic farming (ii) production techniques, (iii) soil fertility management, (iv) pest management, (v) inspection, certification and standardization, and (vi) policies and strategies; of the organic

[8] Brief details on national policies related to organic agriculture in Nepal are presented in Chapter 4.

agriculture in Nepal. We believe that this workshop could be considered as a landmark in the history of organic agriculture in Nepal. Because, (i) the GoN had organized the workshop with participation of significant number of individuals from diverse sectors; (ii) it not only defined the concept of 'organic agriculture' and 'organic product' in simple word for Nepalese, but also established the role of differ stakeholders in the promotion of organic agriculture; and finally (iii) many of the recommendations of the workshop, envisioned for promoting organic agriculture in Nepal, have been included in the *National Standards of Organic Agriculture Production and Processing 2007* – which is the foundation of organic agriculture development in Nepal till today. This standard not only provides basic guidelines for the organic agriculture but also establishes a few organizational structure; the most important are: National Coordination Committee for Organic Agriculture Production and Processing Systems (NCCOAPPS), and National Organic Agriculture Accreditation Body (NOAAB).

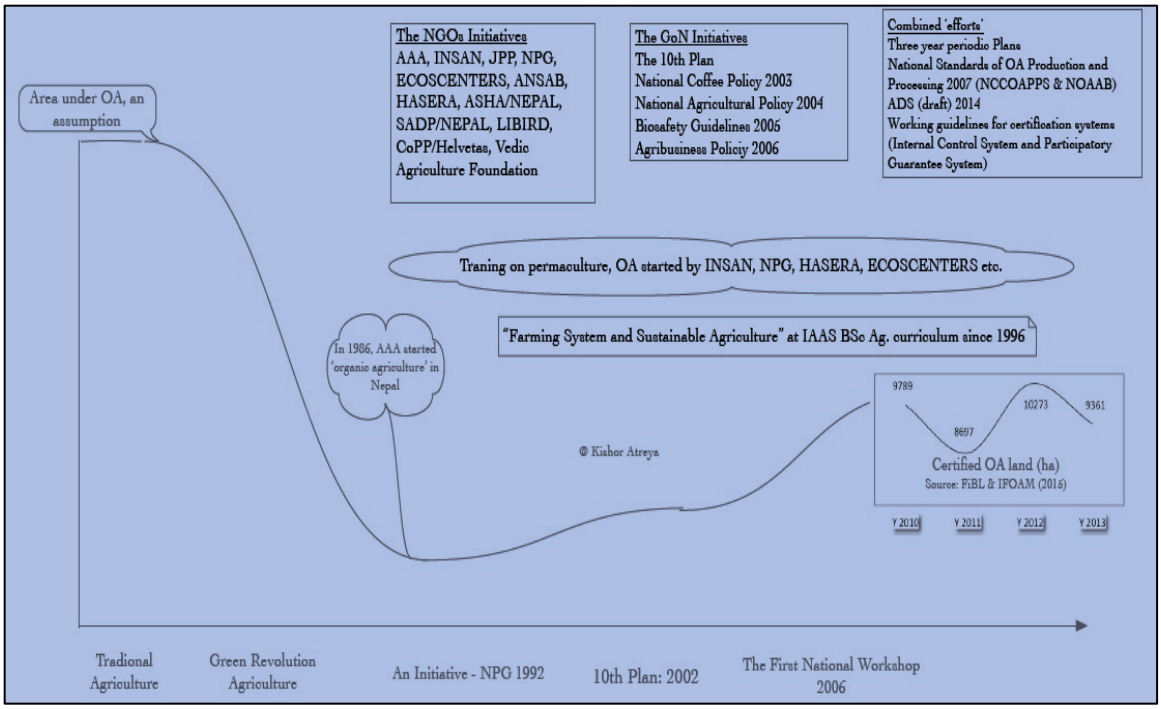

Figure 4. Hypothetical land area of organic agriculture under different agricultural paradigm (until 2009) and a few policy landmarks on the history of organic agriculture in Nepal. The present trend of certified organic land (2010-2013) is estimated from FiBL and IFOAM 2015. The present trend is not straightforward.

In summary, we would like to mention that the 'pure' organic agriculture in Nepal started in 1987 when an American research scholar Ms. Judith Chase established a commercial farm in Bhaktapur district. Since then it was advanced independently until the establishment of NPG, after which the organic agriculture movement was 'merged' with permaculture until the 10th Plan. A decade long 'hidden' period (1992 to 2002) of the organic agriculture movement was due to the APP and the 9th Plan – they favored heavy use of chemical fertilizers and pesticides without proper care on the environment. After 2002 the organic agriculture movement was rejuvenated into policy documents because of significant demand for organic products at international markets. Honestly, the world organic movement 'to change the world farming system' by taking care of nature, the society and the economy is found deviated from its philosophical ground - it accounted for the 'economy' sector of

the organic agriculture. This is why much of the policy documents of Nepal that are supporting organic agriculture promotion have accounted either 'income' or 'export', and or 'business'; and considered organic product as a 'luxurious goods' to fulfill the domestic demand. As a result, much of the structural and institutional innovation in organic agriculture, government priorities, and people perception are now inclined towards earning more rather than its intuition of environmental conservation and sustainability of the farming system.

So far in this Chapter 4, we discussed on the historical landmarks of organic agriculture movement in Nepal. While doing so, you have encountered a few number of policy documents but were briefly described. In the next Chapter 5, details of national policies and other supporting documents on organic agriculture are described.

4. Policies, Plans and Guidelines on Organic Agriculture in Nepal

Description of the policy documents, plans, programs, national standards, working guidelines and periodic five-year plans are presented here with due respect on the organic agriculture. While doing so, we find difficulty in the selection of such documents to be described here, because we found a significant number of national acts, policies, plans, program, standards, and working guidelines for the sector such as agriculture, environment and natural resource base of the country[9]. In one way or other, these sectorial policy documents may have favored organic agriculture by default in Nepal, but for this Chapter, we considered only those documents that are determined to promote organic agriculture in Nepal. As we have said earlier, *true organic agriculture is practiced by intent, not by default*, and therefore, no policy document automatically qualify for enlisting here unless it shows some deliberate affection towards organic agriculture. But, there are always exceptions. For the flow of the text, and for making reader more comprehensive, a few policy documents that are in contradiction of organic agriculture are also described briefly.

While going through many policy documents, we find a lack of national policy formulated specific to organic agriculture; but many provisions in the existing policies are found related to organic agriculture. We find three categories of existing policy documents that are supporting organic agriculture. Those are (a) sectorial national policy favoring organic agriculture, (b) national standard and working guidelines established based upon sectorial policy, and (c) prioritization of organic agriculture in the periodic five-year developmental plan.

4.1. National Policies related (±) to Organic Agriculture

At present, about two-third of the population works in the agricultural sector, which accounts for 33 percent of the gross domestic product. Nepal's agriculture is in a low development stage (ADS 2014). Productivity is low, adoption of new crop variety is minimal, food trade deficit in increasing, and malnutrition is high and use of chemicals and fertilizers in increasing. Further, the situation is exacerbated by the overwhelming out-migration for economic and educational opportunities. During early times, when the 'green revolution agriculture' innovated and applied, the situation of agriculture was in a worse situation than today. As a response to such symptoms of agricultural situation, Nepal government has initiated a plan development since 1950s. Initially, priority was given to the yield and production of the agricultural crops; but now major focus is on diversification of agricultural outputs by balancing environmental resources, ecosystem processes and human dignity.

In 1995, the first consolidated and comprehensive long-term strategic plan for agriculture sector the

[9] A few examples among many are: Food Act 1966, Seed Act 1988, Pesticides Act 1991, Forest Act 1993, Environmental Protection Act 1996, and Plant Protection Act 2007. Also other documents are: National Conservation Strategy 1988, Nepal Environmental Policy and Action Plan 1993, Agriculture Perspective Plan 1995, Sustainable Development Agenda for Nepal 2003, Climate Change Policy 2012, and National Land Use Policy 2012. For details refer to Pant (2014) and GoN (2013).

"*Agricultural Perspective Plan*" was endorsed but fully focused on chemical-intensive agriculture. One of the methods, which hope to eradicate chemical-intensive farming with more sustainable production to meet national food demands as well as markets, is the organic agriculture. Realizing this fact, a few new policies listed organic agriculture and emphasized its promotion through developing national guidelines, easing certification and accreditation process and market obstacles. The most important policy that favors organic agriculture so far is the *National Agricultural Policy 2004*. There are number of sectorial policies that we find mandatory to enlist here. Each policy's objectives are given and their major areas are highlighted, and finally they are scrutinized by its impact on organic agriculture development.

4.1.1. Agricultural Perspective Plan 1995

Objective: The objective of the Agricultural Perspective Plan (APP) was to commercialize the subsistence agriculture and accelerate the economic growth. The APP has given main emphasis to the supply of fertilizer, irrigation, rural agricultural road construction and rural electrification and the use of agro-ecologically appropriate technology.

Main Highlights: It is the first consolidated, elaborative and comprehensive long-term strategic documents in the agriculture sector. It includes strategies for agricultural transformation and economic development such as crop diversification, comparative advantages, and inputs maximization. It put heavy emphasis on chemicals such as pesticides, chemical fertilizers, and antibiotics without adequately addressing food and safety resulted significant environmental and health degradations.

Focus on Organic Agriculture: APP has no consideration of organic agriculture at all. Just opposite to the principles of organic agriculture, it favored increased use of chemical pesticides and fertilizers. However, it recognized the effects of chemical pesticides, and thus emphasized IPM. It was very short-term sighted, ambitious, and input oriented plan that resulted many environmental and ecological imbalances in the agro-ecosystems. The APP formulation was based on a narrow view of technology excessively focused on a green revolution perspective that is not appropriate for large parts of Nepali agro ecology (ADS 2014). The impact of this policy on organic agriculture was negative!

4.1.2. National Fertilizer Policy 2002

Objective: It aims to ensure supplies of quality fertilizers in the country for increasing agricultural production. The Policy attempts to increase production, import and distribution chemical fertilizers.

Main Highlights: The major highlights of the Policy include involvement of private sector in the fertilizer markets, promotion of balanced use of organic and chemical fertilizers, promotion of IPNM system for efficient and balanced use, timely availability, transparent, competitive and effective distribution systems are the main strategies.

Focus on Organic Agriculture: The Fertilizer Policy is focusing more on chemical fertilizers or a judicial combination of organic and chemical fertilizers and not on the organic farming. It has favored increased use of chemical fertilizers. However, it emphasized the use of IPNM system for efficient and balanced use of fertilizers. So it did not consider environmental effects of chemical fertilizers

while emphasizing IPNM system, rather it focused on optimum production. The impact of this policy on organic agriculture is negative!

4.1.3. National Coffee Policy 2003

Objective: It aims at import substitution and export promotion of coffee through developing sustainable coffee industry for income generation, employment promotion, foreign exchange earnings and environmental protection.

Main Highlights: The policy assumes that planting coffee will improve and protect environment.

Focus on Organic Agriculture: It has proposed the development of organic coffee with a national logo. Although it promotes organic coffee, the main aim of the policy is import substitution and export promotion, that indicates the policy is biased towards 'incomes', 'exports' rather than environmental care and fairness. The impact of this policy on organic agriculture is limited to coffee!

4.1.4. National Agricultural Policy 2004

Objective: The main objective of the National Agricultural Policy is to improve the standard of living through a sustainable agricultural development, which is achieved by transforming the current subsistence farming system into a commercial and competitive farming system. It focuses on i. Increase of agricultural production and productivity, ii. Development of a commercial and competitive farming system in order to make it competitive in the regional and world markets, and iii. Conservation, promotion and proper utilization of natural resources, as well as the environment and bio-diversity.

Main Highlights: It has listed a number of policies (a total of 56) to be adopted to achieve the objectives under the three headings: (i) agricultural production and productivity (26 policies); (ii) development of a commercial and competitive farming system (23 policies); and (iii) conservation, promotion and utilization of natural resources and the environment (7 policies).

Focus on Organic Agriculture: The policy has encouraged organic farming and provides support for the accreditation; but it considers organic agriculture for 'export'. It mentioned, "*Organic farming shall be encouraged. Necessary support shall be provided for the certification of the standard of exportable agricultural products produced in production areas based on organic farming.*" For the conservation, promotion and utilization of the natural resources and the environment, the policy realized the negative impact of the use of agro-chemicals and encouraged the production, use and promotion of organic fertilizers. In conclusion: this policy supports organic agriculture through encouraging its application and supporting certification process, increased production and use of organic fertilizers, and developing food standards to control quality and certify food products.

Final Remarks: There is a need to consider ecosystem based or agro-ecology based production of organic agriculture. The National Agricultural Policy has listed the 'best approaches' of the agricultural production systems and focused on competitive advantages for benefits, which seems to support ANSAB's Ecosystem-based Commercial Agriculture. The policy is not fully 'organic' because it does not ban chemical fertilizer and pesticide use, hormones, antibiotics, etc. but only

'regulates' GMOs and promotes organic farming for 'export'. The impact of this policy on organic agriculture is found positive and significant, but more directed to 'economy'!

4.1.5. Agribusiness Policy 2006

Objective: It followed upon the National Agricultural Policy to further support market-orientation and competitive agricultural production, to contribute to increased capturing of the domestic markets, to support agro-industries on export promotion, and to assist poverty alleviation through agribusinesses.

Main Highlights: It emphasizes on product diversification, service delivery and private sector involvement in agriculture transformation. Major thrust was laid on quality control of agriculture inputs, services and outputs agriculture commercialization. The policy proposed three types of production areas: (1) commercial crop and commodity production area, (2) organic and pesticide free production area, and (3) agricultural products export area. It also proposed for the establishment of accredited independent analytical laboratory in public and private sectors.

Focus on Organic Agriculture: For producing quality products as required by the domestic and export markets, the policy proposed for designation and demarcation of three types of production areas, namely commercial crop/commodity production area, organic/pesticide free production area, and agricultural products export area.

Final Remarks: Sectorial policy mainly focused on agribusiness, but favor organic agriculture by demarcating special production area. It however, still misses 'farness' and 'care' principles of organic agriculture with major focus on 'export' and 'incomes' rather than environmental conservation. The impact of this policy on organic agriculture is slightly positive but the proper implementation of the policy has not been observed so far!

4.1.6. Agricultural Biodiversity Policy 2006 (Amendment in 2014)

Objective: The objective of the policy is to identify, conserve, promote and suitably use of agrobiodiversity and to contribute to maintain sustainable ecological balance and climate change resilient.

Main Highlights: It provides overall policy framework for conservation of agricultural biodiversity in the country. The policy realized that agrobiodiversity is the important base for food and nutrition security, livelihood, poverty reduction, environmental balance, and sustainable development. The policy prioritizes integrated farming system such as organic farming, home garden, agroforestry, bio-village, and agro-tourism for sustainable use. Also it emphasizes the use of vermicomposting, bio fertilizers, bio pesticides, and pollination services.

Focus on Organic Agriculture: This policy has a provision that requires obtaining permission from authorized agencies to conduct research on GMOs. It further states the government can also put a ban on importing GMOs that has potential risk of altering biodiversity and rendering negative impacts on the environment. For the sustainable use of agrobiodiversity, organic farming is considered as an integrated farming system. Also the use of bio fertilizers and bio pesticides is emphasized. The policy has also emphasized to consider the effects of agricultural inputs on

pollinators, natural predators and parasites, and soil biota while the application of the inputs. Promotion of safety pesticide use, integrated pest management and organic farming are also prescribed for conserving pollinators and their habitats.

Final Remarks: It controls the use of GMOs and promotes organic agriculture to conserve agrobiodiversity. The impact of this policy on organic agriculture is positive!

4.1.7. Trade Policy 2009

Objectives: When Nepal acceded to the World Trade Organization (WTO) and regional trading arrangement of SAFTA (South Asian Free Trade Area) and BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation), it was necessary to harness international market potential through identification and development of exportable goods. In this regard, the Trade Policy 2009 was formulated with a strategic vision of supporting the economic development and poverty alleviation initiatives through the enhanced contribution of trade sector to the national economy.

Focus on Organic Agriculture: The policy provides assistance to the packaging, storing and certification of agricultural products for making their production and processing compatible to international demand by utilizing opportunities for diversification in agricultural production (Article 4.8.2.2). Orthodox tea, vegetables seeds, large cardamom, pulses, floriculture, gingers/dried gingers, herbs and essential oils, coffee, honey, orange, and vegetables are the major agricultural commodity prioritized for export.

The policy emphasized organic coffee, organic honey and organic vegetables under commodity development program. In the Article 8.2.12, it says 'export promotion of organic coffee', whereas in another Article 8.2.13 it promotes production of exportable organic honey. Similarly, the Article 8.2.15 is all about vegetables. It clearly says, 'Production of organic, fresh and dried vegetables will be encouraged. A mechanism will be developed to issue inspection certificates for the vegetables, and the areas for production of organic vegetables will be identified and promoted." This policy nullifies Trade Policy 1992.

Final Remarks: It supports organic certifications and promotes organic tea, coffee, honey and vegetables for export. So, its impact must be positive.

4.1.8. Nepal Trade Integration Strategy 2010

The Nepal Trade Integration Strategy (NTIS) 2010 is the priority actions of the GoN in order to expand Nepal's trade, particularly export business, and it seeks private sector partnership to accomplish the work done. It has identified a list of 19 possible priority export potential goods and services. Among these, seven commodities are related to 'agro-food' – namely: cardamom, ginger, honey, lentils, tea, noodles, and medicinal herbs/essential oils. It identified the need of promoting organic certification of such commodity because of lack of a national organic certification system. So it recommends to implement a policy and institutional system for issuing an internationally recognized organic certificate develop by the GoN, especially for honey, tea, coffee, and medicinal herbs.

4.1.9. Climate Change Policy 2011[10]

Objective: The Climate Change Policy envisions the country spared from the adverse impacts of climate change. The main goal of this policy is to improve livelihoods by mitigating and adapting to the adverse impacts of climate change, adopting a low-carbon emissions socio-economic development path and supporting and collaborating in the spirits of country's commitments to national and international agreements related to climate change.

Main Highlights: In order to achieve the objectives of the policy, a number of policies are adopted under different category: (i) climate adaptation and disaster risk reduction, (ii) low carbon development and climate resilience, (iii) access to financial resources and utilization, (iv) capacity building, peoples' participation and empowerment, (v) study and research, (vi) technology development, transfer and utilization, and (vi) climate-friendly natural resources management. Under the last heading, much emphasis is given in proper utilization, promotion and conservation of forest resources.

Focus on Organic Agriculture: Organic agriculture is silent, however agriculture insurance in the climate change affected areas has been introduced. The impact of this policy on organic agriculture cannot be quantified so far.

4.1.10. Agricultural Development Strategy (final report) 2014

Objective: The vision of the Agricultural Development Strategy (ADS) is "self-reliant, sustainable, competitive, and inclusive agricultural sector that drives economic growth and contributes to improved livelihoods and food and nutrition security." The report has listed a few but very significant indicators to monitor progress of the ADS action plan. Seven vision component (self-reliant, sustainability, competitive, inclusive, growth, livelihood, food and nutrition security) and their respective indicators to be achieved under short-term, medium term and long-term targets are given.

Main Highlights: The ADS is expected to guide the agricultural sector of Nepal over the next 20 years. It realized weak performance of agriculture over the past (3% growth rate), and major factors described for this slow pace of agricultural growth are 12-years conflict and migration in cities resulted labor scarcity, urbanization converted fertile soils into residential, political instability resulted lack of stable government and effort to implement policies, plans and programs. Other factors described are formulation of ambitious and poor plans, weak institutional capacity, limited public and private partnership, and limited human resource capacity. Conceptually, it tries to

[10] Although the policy approved in the year 2011, a number of activities were considered before as well. Promoting projects for the clean development mechanism; addressing climate change by Sustainable Development Agenda (in 2003), Millennium Development Goals (in 2001); organized cabinet meeting at Kalapathhar; and establishment of 25-member Climate Change Council are good initiatives. Even the Interim Constitution of Nepal (2007) and Three-Year Interim Plan (2008-2010) have addresses the issue of environmental management and climate change. Climate Change Management Division under the Ministry of Environment established in 2010; National Adaptation Program of Action (NAPA), Local Adaption Plans of Action (LAPAs) are prepared and approved in 2010. National Planning Commission initiated climate-resilient planning tools in the fiscal year 2010/11.

transform Nepalese economy from primitive agricultural based income to services and industry-based incomes. Sustainable agriculture (environmental, economic and social) can be achieved with good practices such as intercropping systems, conservation tillage, organic farming, agroforestry, and efficient water management, application of IPM, IPNM.

Focus on Organic Agriculture: Among many indicators to monitor progress of ADS vision, agricultural land sustainability has been monitored by percent of soil organic matter (SOM). The 1% SOM of agricultural land at present situation has been targeted to increase at 2% within 5 years and 4% within 10 years. Also it emphasizes organic branding of agricultural products for competitiveness and export. It emphasizes promotion of organic/bio fertilizer as supplementary and complementary to chemical fertilizers for sustaining soil fertility and to attain higher productivity.

Final Remarks: The ADS does not prohibit use of chemical fertilizer and pesticides in agriculture, not even a single location. It seeks to establish commercial organic/bio fertilizer production enterprises as well as seeks to conduct feasibility study of chemical fertilizer factory within country through private-public partnership. A few lessons learned from the APP have been taken care of while formulating ADS. The need of ensuring governance, promoting effective participation of stakeholders, addressing land issues, effective support to decentralized research and extension, and promoting commercialization and competitiveness are among many. Focused on food and nutrition security though agricultural development. ADS acknowledge that human health is directly related to nutritious food. As the SOM is the one of many indicators to assess land sustainability, its impact on the organic agriculture will be positive; but still no clear vision on the organic agriculture.

4.2. National Standard and Working Guidelines of Organic Agriculture

In Nepal, organic foods are sold directly to consumers or in small markets, in which consumers trust farmer's organic practices. However, as the market for organic food expanded internationally, the need of organic standards, certification and labels were felt. Organic certification is the verification process that products are produced according to certain standards. This also builds confidence at the consumer side, and establishes a good relationship between producers and consumers. For farmers, the standards are clear guidelines on how to take advantages of increasing demand of organic food. Also it is a marketing strategy as well.

As we have mentioned earlier, *National Standards of Organic Agriculture Production and Processing 2007* is the foundation of organic agriculture development in Nepal till today. The standards came into effect as a result of *National Agricultural Policy 2004*, and *Agribusiness Policy 2006*. These both national policies have encouraged organic agriculture – through supporting accreditation, certification of the products, and encouraging use of bio fertilizers and quality inputs. The most important, although not implemented so far, is the demarcation of special area of organic production by *Agribusiness Policy 2006*.

In addition to the Standards, there are a few working guidelines/procedures approved by GoN for the promotion of organic agriculture in Nepal. A few of them, for example, are - Working Procedure for Monitoring Organic and Bio-fertilizer 2068, Procedure for Registration Process on National Accreditation Body for Organic Agriculture 2069, Guidelines for Group Certification Internal Control System of Organic Agriculture Production 2069, Guidelines for Participatory

Guarantee System 2069, Working Guidelines for Subsidies on Organic Agriculture Certification Process for Export 2069, Working Procedures for Subsidies for Implementing Internal Control System of Organic Certification 2071, and Working Procedures for additional budget allocated for VDCs for organic agriculture 2071.

4.2.1. National Standards of Organic Agriculture Production and Processing

It is a set of rules, regulations, guidelines and procedures for the production and processing of organic products, mainly regulated and evaluated by high level national bodies and if a farm request for certification of his/her products with labels like 'biodynamic', 'organic', 'ecological' and 'biological', this standard needs to be strictly followed. It prohibits chemical contamination in production, transfer and processing and use of genetically modified organisms and radioactive devices. The standard further limits the use of synthetic fertilizers and contaminated manure and emphasizes the use of local-variety, organic seed source and no chemical seed treatment. It establishes a few organizational structures for organic certification and accreditation such as National Coordination Committee for Organic Agriculture Production and Processing Systems (NCCOAPPS), and National Organic Agriculture Accreditation Body (NOAAB). This is the most important landmark in the history of organic agriculture movement in Nepal. The standards are needed for quality assurance and to protect consumers against deception and fraud.

The overall objective of the standard is to meet consumer demands of quality organic product production with maintaining ecological balances. It has prioritized both agriculture as well as livestock management. The standard are set for land; conversion period; crop production; soil, water and manure management; diseases, insects and weed management; storage procedures; livestock farming; fish farming; bee farming; processing, packaging, and storage; and social responsibility and fare business. Also it has visualized a few regulating organizational body such as NCCOAPPS and NOAAB along with many other institution such as Accredited Organic Certification Body (AOCB), Accredited Inspectors (AI), Organic Inspector (OI), and so on. The authority to provide logo for certification is rest on the AOCB. Finally, there are a few appendixes that have listed dos and don't for the organic agriculture production and processing at the end.

It is a good sign that Nepal has set the standard for organic agriculture production, processing and marketing. But it has a few limitations. The main issues are *its clarity*, *qualitative in nature* and *realism*. In many cases, *the standards are unclear*. For example, Article 3.4.4 allows use of potassium fertilizer for composting @ 5-10 kg per metric tone of compost, but the Article 3.4.8 limits its use at 5 kg per metric tone of compost. Similarly, Article 3.5.6 allows use of chemical pesticides for pest control! Also Article 4.1 enlists the members of the NCCOAPPS from five different ministries, however, the organizational structure of organic agriculture (Annex 5) listed only four ministries. *The standards are mostly qualitative*. Most of the standard describes do's and don'ts for organic agriculture. It cannot be quantified or monitored. This may result in deviation of the quality of production process and products. Many argue that these standards are established looking into international markets, so are very tough to follow step by step; and therefore, local *farmers face difficulties in reality*. Also there are documentations that mentioned that the high level organizational bodies such as NCCOAPPS and NOAAB are less functional. The effectiveness of NOAAB for promoting organic agriculture in

Nepal is hindrance by the 'hierarchy problem'[11]. The members of the body are belonging to high-level officials from different ministry whereas the organic producers are working at the lowest level in field. For certification, the producer must approach this body and vise versa - which is a difficult task. Because of this, the body in general hires 'freelancer' to accomplish the work that cost extra. So revising the standards is recommended; and NCCAPPS and NOAAB need re-shuffling accordingly. Both institutions need to be represented by professionals from I/NGOs, academics, producers and processors/traders. Further, binding farmers through specific command and control mechanisms on using inputs and farming methods for increased 'premium price' violates the organic movement philosophy of holistic process.

In conclusion, endorsement of Nepalese standards for organic agriculture is a commendable that shows government priority towards it; but is observed to be qualitative in nature. The qualitative rules and regulation may result in unobserved 'contamination' of the organic products. In addition, the certification process does not account for important local and regional differences in farming systems and makes the cost of certification favor to large farm. Nepalese farmers who are producing crops without chemicals by default in remote areas need to tolerate extra economic and social burden. The standard and certification process may be weakened over time due to political and business interests. Thus, it is recommended to its revision because it lacks good practices for maintaining 'ecological-standard' of the organic farming; lacks quantitative standards, and are unclear at a few instances. We highly recommend relaxing standards for farmers who want to go only for domestic market.

While making revision, it is recommended to make a reference of the IFOAM Norms for Organic Production and Processing (IFOAM 2014)[12] along with many other important one. There are many countries already endorsed the national level standards. As of 2013, a total of 83 countries have their own organic regulations (IFOAM 2015). It is a common practice that organic producers choose certifying bodies based on its future market. For example, if a producer targets for USA, then he/she follows USDA's National Organic Program (NOP) Guidelines and certified with NOP accredited body. Similarly, if producer targets European Union countries, then follows European Commission (EC) regulations and standards with associated certifying body. In Nepal, the familiar international organic standards and regulations followed are USDA's NOP, EC, FAO/WHO Codex Alimentarius Commission (CAC), Japanese Agricultural Standard (JAS), IFOAM, National Organic Standard, India; and Department of Agriculture, Australia.

4.2.2. Registration Process of Accreditation of Organic Certification Body

The Article 4.2 of the *National Standards of Organic Agriculture Production and Processing 2007* established NOAAB that is a national coordination body. It regulates, monitors and evaluates organic agriculture development in Nepal. It also accredited organic agriculture certification body (OCB), both national and international, and allows them to use organic logo. The NOAAB has authoritative power to include/exclude, expel, or cancel the OCB. The standard lacks clear procedures for the registration process of OCB on NOAAB. Therefore, Ministry of Agriculture Development has prepared and endorsed this procedure on 19.02.2013.

[11] Yubak Dwoj GC, General Director, Department of Agriculture; personal communication on 26 May 2015.
[12] http://infohub.ifoam.bio/sites/default/files/ifoam_norms_version_july_2014.pdf

It clearly defines the OCB's areas such as agricultural and livestock products certification, organic honey and fish, organic fertilizers and pesticides, herbal and non-timber forest products, flower production, and processed items of all of the above commodity. The OCB must follow the national standards for certification process. The NOAAB announces the registration of OCBs in the national daily newspaper, and AOCBs must apply within 30 days. Registration fees are set, NPR 1000 (renewal 500/year) for national OCBs; and NPR 10,000 (renewal 5000/year) for international OCBs. Once approved, these OCBs are allow certifying organic products of different sectors, and need to submit annual report to NOAAB detailing its progress and achievements. If ACBs violate establish rules and regulations in certification process, NOAAB may cancel its accreditation.

NOAAB has so far accredited not any certifying bodies (CBs). Until now, only two CBs have applied for accreditation in NOAAB[13]. Even the Nepali certifying body, Organic Certification Nepal (OCN) that issues third-party organic certification[14] since 2007, is affiliated with the Certification Alliance Bangkok. The major third-party organic certifying bodies in Nepal are:

- NASAA - http://www.nasaa.com.au/index.html
- EcoCert - http://www.ecocert.com/en/organic-farming
- OneCert - https://www.onecert.com
- LACON Gmbh - http://www.lacon-institut.com/Pages/en
- SGS - http://www.sgs.com/en/Agriculture-Food/Food/Retail-and-Hospitality/Other-Food-Certification/Organic-Certification.aspx
- Institute of Market Ecology - http://www.imo.ch/logicio/pmws/indexDOM.php?client_id=imo&page_id=home
- Certification of Environmental Standards GmbH (CERES) - http://www.ceres-cert.com/portal/index.php?id=2&L=1
- Aditi Organic Certifications Pvt. Ltd. - http://aditicert.net
- CertAll accredited OCN - http://www.certificationalliance.org/ver1/partners.html
- The Himalayan Bio-organic Agriculture Center Nepal (HIMBOAC-NEPAL) - http://www.himalayabio-organic.com/organic_certification.php
- Coffee Co-operative Union Ltd. - http://www.coffeecullnepal.org/?obj=certification

It is common that a third-party organic agriculture certification body may be accredited to more than one regulating organization. For example, USDA, JAS, and other national regulating bodies accredited NASAA, OneCert and EcoCert.

Third-party certification is viewed as more reliable and credible, so widely used all over the world but it is costly[15] for small farmers – therefore as an alternative, smallholder group certification based

[13] Tara Kumar Shrestha, Secretary General, NOAAB – personal communication on 26 May 2015.

[14] In general, there are three types of organic certification in Nepal. The first one is the Third-party Certification (TPC), the second one is the Smallholder Group Certification based on Internal Control System (ICS), and the final one is the Participatory Guarantee System (PGS). The certification process is not free from threats and challenges. For further details on the types of certification, refer to https://ec.europa.eu/europeaid/sites/devco/files/study-organic-agriculture-201206_en_5.pdf or https://en.wikipedia.org/wiki/Organic_certification.

[15] Costs for certification consist of costs for travel and accommodation of the inspector, fees for the inspection (depending on the number of days required), a certification fee (depending on the different standards you want to be

on Internal Control System (ICS) was developed. Still the costs and inflexibility of the certification process of ICS is a barrier for small farmers in developing world, therefore, Participatory Guarantee Systems (PGS) evolved. Government of Nepal has already endorsed working guidelines for ICS on 14th September 2012 and PGS on 19th February 2013.

4.2.3. Guidelines of Internal Control System for Group Certification

Most of the Nepalese farmers are smallholders. Without acknowledging their problems of agricultural origin, adoption of organic agriculture and its certification are far from reach. To acknowledge such problems, ICS was developed at international arena. It is still a special type of third-party certification, aimed to simplify certification process at lower cost. IFOAM defines ICS based smallholder group certification as being based on a documented quality assurance system that allows an external certification body to delegate the periodic inspection of individual group members to an identified body or unit within the certified operator. This means that the third party certification bodies only have to inspect the proper functioning of the system, as well as perform a few spot-check re-inspections of individual smallholders.

The working guidelines of ICS of Nepal describe the role and responsibility and required qualification of the person involved in the ICS certification process (Section 2). The institutional arrangement required for the ICS are also provided. Each and every member of the ICS systems must obeyed prescribed duties for quality assurance of the organic products. The Section 3 describes its command area and activities, and farm management and approval procedures are given in the Section 4. The final Section 5 provides guidelines on punishment if an individual violates rules and regulations. Also there are a total of 10 Annexes such as application format, contract format, initial examination of the farm, member identification code format, village map requirement, inspector assessment format and so on.

In short, ICS is a contractual arrangement with each individual member of the group. The group designates internal inspectors to carry out internal controls. The internal inspectors carry out at least one annual inspection visit to each individual farmer including fields and facilities. The ICS keeps appropriate documentation of the farms and the facilities, the production plans, the products harvested, the contractual arrangement with each individual member and internal inspection reports. The ICS includes the application of sanctions to individual members who do not comply with the production standards. Here several small scale farmers with similar farming practices who market collectively can be certified together, with internal inspectors inspecting every farm, and an external accredited certification body auditing the group's ICS. This certification system also needs help of external third-party certification body, which is costly, and local poor farmers cannot afford extra economic burden – thus Participatory Guarantee System (PGS) was developed and GoN has already endorsed its working guidelines.

4.2.4. Guidelines for Participatory Guarantee Systems

According to IFOAM, Participatory Guarantee Systems (PGS) are "locally focused quality assurance systems. They certify producers based on active participation of stakeholders and are built on a

certified against, e.g. EU and NOP), as well as the eventual costs of transaction certificates. In general, it ranges from NPR 150,000 to NPR 500,000, and annual renewal is compulsory.

foundation of trust, social networks and knowledge exchange." The PGS is a certification scheme particularly for small farmers whose products are of high demand in the local market, but who cannot meet the high cost of certification. IFOAM supports the development of PGS as an alternative and complementary tool to third-party certification and advocates for the recognition of PGS by governments. This system is especially adapted to local markets and foodstuffs having short supply chains. PGS enable the direct participation of producers, consumers and other stakeholders in (i) the choice and definition of the standard; (ii) the development and implementation of certification procedures; and (iii) the certification decisions. However, in Nepal, the PGS is almost non-existence in practice because of lack of trust and institutional networks among producers and consumers. Further, government policy documents are not clear on the implementation of the PGS.

5.3. Periodic Five-Year Plans and Organic Agriculture

Knowing how organic agriculture was prioritized into the national period plans not only provides information on the history about it, but also this helps in the tracing of the institutional development of organic agriculture in Nepal. Here we start with the 9th plan, because the term 'organic agriculture' is found in the 10th plan, so it would be better to understand how the negative effects of the intensive agriculture had been considered just before its origin into the plan.

4.3.1. The 9th Five-Year Plan (1997-2001)

Overall Objectives: Its main objective was poverty alleviation. The target was to have 32% population below poverty line at the end.

Agriculture Sector Highlights: The 9th Plan envisioned annual economic growth of 6%, and that of agriculture sector at 4%, and non-agricultural sector at 7.3%. Emphasized intensive agriculture, agriculture diversification and commercialization, and agri-business of high returns. Use of modern inputs was strongly emphasized to increase crop productivity; so the plan was heavily dependent on APP and 'green revolution technology'. The following were the sectorial objectives: (1) to contribute to poverty alleviation by increasing productivity of resources and inputs and by generating opportunities of employment through speeding up of the economic growth of the agricultural sector; (2) to minimize impact on environment by amalgamating the utilization of external production inputs and the natural resources in agriculture sector; (3) to strengthen the foundation of agro-based industry and industrialization through diversification and commercialization of agriculture; (4) to develop leadership of women in the production programmed by involving them in the agricultural development and by increasing their participation; and (5) to improve the situation of nutrition of the people by increasing the production of the food grains and nutritious food in order to promote food security.

The Focus on Organic Agriculture and Final Remarks: Emphasized on integrated plant nutrient management service in irrigated areas; applications of green manure and organic manure prioritized for maintaining soil fertility. Integrated plant protection services considered minimizing adverse impact of the pesticides on the environment and public health. Neither the term 'organic agriculture' nor 'organic farming' was found. However, at this time, the negative effects of pesticides were realized; and balanced use of organic manure and chemical fertilizers emphasized. The agriculture sector was based on the APP for increasing production, providing food security, increasing employment and income and ultimately contributing to poverty alleviation.

4.3.2. The 10th Five-Year Plan (2002–2007)

Overall Objectives: The main objective was to alleviate poverty by improving economic, human and social indicators through optimal use of resources, public-private partnership, and widening access to means and economic programs for women and other marginalized group. The target was to have 30-33% population below poverty line at the end. The Plan has formulated a poverty reduction strategy based on four pillars -broad based high and sustainable growth, social sector development with emphasis on human development, targeted programs with emphasis on social inclusion and improved governance.

Agriculture Sector Highlights: Because of Maoist insurgency, the plan postulated two different scenarios for the economic growth. The one was the 'normal case' and another was the 'lower case'. It targeted annual economic growth rate of 6.2, and that of agriculture sector at 4.1% and non-agricultural sector at 7.5%. But if the security environment and investment scenario unimproved (lower case scenario), the target set was 4.3%, 2.8% and 5.2% respectively. The sectorial objectives were to (1) reduce poverty by increasing production, productivity and income in the agriculture sector, (2) contribute to the sustainable production and growth, protect and use of agro-biodiversity and balance the environment by reducing pollution from the use of external inputs, and (3) develop internal market and promote export opportunities by promoting agro based industries and enterprises with the participation of cooperatives and private sectors.

The Focus on Organic Agriculture and Final Remarks: The term 'organic farming' introduced in the Plan as the mean of reducing chemical pesticide use. IPM promoted as a mean to reduce pesticide use, but emphasized production of agricultural crops under organic. The plan encouraged participation of cooperatives and private sector in the use of organic fertilizer, balanced use of chemical and organic fertilizers, and production of organic fertilizers from waste generated in the agricultural markets. However, the plan was focused on agricultural commercialization and diversification with heavy use of inputs. Although it recognized the importance of organic farming and included in its policy and strategy, it was directed to income opportunity and decreased chemical pesticide use, not for environmental and human health perspective.

4.3.3. The 11th Three-Year Plan (2008–2010)

Overall Objectives: The goal was to lay a foundation for economic and social transformation to build a prosperous, modern and just Nepal. The objective was to reduce unemployment, poverty, and inequality in the country. The target was to have 24% population below poverty line at the end.

Agriculture Sector Highlights: It targets annual economic growth of 5.5%, and that of agriculture sector at 3.6%, and non-agricultural sector at 6.5%. Adopted Agriculture Perspective Plan (APP) as a principle policy for the development of agriculture. The plan had listed a number of problems and challenges for (i) the increase in the production of agriculture and livestock, (ii) agriculture commercialization, (iii) agriculture and livestock service delivery, and (iv) food quality and protection of consumers rights. The sectorial vision was to modernize and commercialize the agriculture sector, by acknowledging the APP and the NAP as the central policy for the development of agriculture. The overall goal was to achieve gender inclusive sustainable agricultural growth. The specific objectives were to (1) increase agricultural production and productivity, (2) maintain food sovereignty by ensuring food security, (3) make agriculture and livestock sector competitive,

commercialized (4) increase employment opportunities for youth and other people, and (5) conserve, promote and utilize agricultural biodiversity

The Focus on Organic Agriculture and Final Remarks: The plan faced a challenge to secure Nepal's access to the international market by increasing the credibility of organic products in local markets. With a view to make Nepal known as an Organic Country, programs are sought to implement in the specified areas with the formation of tangible policies and programs. It has emphasized on the establishment of accredited laboratories and up gradation of the existing one for quality management and regulation of the agricultural products. It has also planned to certify the quality of exportable agro products of Nepali origin. The plan seeks to arrange to control or prohibit the production of GMOs that carry risks of negative impacts on biodiversity, environment, and human health. The programs for agricultural commercialization and business included are promotion of organic farming at 10 districts. In the periodic plans, we assume that this is the significant consideration for organic agriculture but it has focused on 'income' and 'export'. The commitment for formulation of policy and programs related to organic agriculture are commendable. In conclusion, it described in details strategies and programs for organic agriculture. It has planned to form policies and programs on organic agriculture accepting that Nepal can be declared as "organic Nepal", tried to control GMOs, and promoted organic agriculture in 10 districts.

4.3.4. The 12th Three-Year Plan (2011–2013)

Overall Objectives: The plan envisages pushing Nepal to developing country from the existing LDC within two decades. The plan seeks to meet MDGs within 2015, improve people's living standard, and economic growth. For this, it targeted job creation, minimizing economic disparity, balance regional development and social insecurity. The target was to have 21% population below poverty line at the end.

Agriculture Sector Highlights: It envisioned annual economic growth of 5.5%, and that of agriculture sector at 3.9%, and non-agricultural sector at 6.4%. The long-term vision of the plan was to make agriculture modernized, commercialized and competitive for food and nutrition security. The plan realized the fact that agriculture is the backbone of Nepal's economic development and thus emphasized (1) agriculture modernization and commercialization for food and nutrition security, and increased scope of agriculture sector on job creation, poverty reduction and trade balance; (2) to improve rural people living standard through increased agricultural and livestock production and productivity.

The Focus on Organic Agriculture and Final Remarks: As a strategy, the plan mentioned to promote organic agriculture. Prioritized to the development of organic fertilizer factory. To promote organic agriculture, it emphasized on the identification of organic agriculture zone and area declaration; facilitated product branding and certification, and finally promotion of organic agriculture-tourisms. Also for the expansion of organic agriculture, it seeks to disseminate organic agriculture technology at local level through increasing cooperation among national and international organizations. The plan considered organic agriculture as a strategy for agriculture development.

4.3.5. The 13th Three-Year Plan (2014-2016)

Overall Objectives: The plan envisages pushing Nepal to the status of developing country from the

existing Least Developed Country (LDC) by 2022-- achieving an annual growth of six percent. The objective of the plan is to increase in people living standard through minimizing economic and social poverty. The target is to make population below poverty line at 18%.

Agriculture Sector Highlights: It envisions the annual economic growth of agriculture sector at 4.5%, and non-agricultural sector at 6.7%. The plan emphasizes on increase in sector productivity, diversification and commercialization for food and nutrition security, sustainable agriculture development and increased people living standard. The main objectives of the agriculture sector are: (1) to increase agricultural and livestock production and productivity, (2) to make agriculture and livestock production competitive and commercialize, (3) to develop and promote environmental safe agricultural technology for climate resilient agriculture, and (4) to conserve, promote and utilization of agrobiodiversity. It also seeks to attract youth population in commercial agriculture and agro-tourisms.

The Focus on Organic Agriculture and Final Remarks: The plan seeks to promote organic farming, through facilitating branding and certification of the crops that have international markets. So the plan has also explored organic agriculture for 'export'. Promotion of IPM and organic fertilizers to minimize negative effects of pesticides on human health are sought. The plan envisions development of agriculture sector according to the 20 years ADS.

5. Conclusion and Recommendations

Despite the growing opportunity of organic agriculture for environmental conservation and sustainable livelihood of Nepalese people, only 0.20% of the total agricultural land area has been certified as organic until 2013. It shows great scope of organic agriculture in Nepal, however there are a few myths on it that needs to be eliminated. We still practice 'ancient agriculture' in remote parts of Nepal – which is thought to be very suitable for organic farming. Great possibility of organic farming exists in such places because these lands are not yet 'contaminated' by the modern technologies and synthetic fertilizers and pesticides.

Although FAO has called for paradigm shift in growing food – away from high input industrial agriculture to more sustainable ecological agriculture - the government of Nepal seems to favor 'industrial agriculture' so it has emphasized use of synthetic fertilizers and chemical pesticides. This is worrisome, but we see a some efforts from the government towards agriculture sustainability – for example, introduction of integrated pest management, integrated soil nutrient management, promotion of agro-forestry, sustainable rice intensification, and organic farming are prioritized. Among these, organic agriculture is well accepted by people of Nepal in terms of production and institutional development. But we see limited area conversion for organic agriculture. We are still struggling at the Level 1 and Level 2 of the conversion steps; however a very few number of policy favors conversion up to the Level 3. Re-designing the agro-ecosystem, such as "landscape farming", "bio-village", and "agro-tourism" are mentioned in the policy documents. But it is yet to be implemented in the field.

The movement of 'pure' organic agriculture in Nepal started in 1987. In 2002 the organic agriculture movement was revitalized into the 10th Plan. Since then GoN has been promoting organic agriculture via formulating different agricultural policy such as National Agricultural Policy 2004, Agribusiness Policy 2006, and approving National Standards of Organic Agriculture Production and Processing 2007. These three documents are the regulatory framework of the government for organic agriculture development in Nepal. The President of Nepal also emphasized organic agriculture in his Parliamentary Speech on the GoN's policies and programs for the fiscal year 2015/16 in July 8th 2015. Establishment NOAAB and the NCCOAPPS are worth mentioning. The working guidelines for two certification systems (Internal Control System and Participatory Guarantee System) are developed, both of which serve as an important instrument for taking advantage of the international and domestic markets. The latter is a certification scheme particularly for small farmers whose products are of high demand in the local market, but who cannot meet the high cost of certification – the most suitable certification approach for Nepal but in practice it is non-existence[16]. Also a few policies prioritize application of organic fertilizer and establishment of organic fertilizer factory within country, for which, nearly 50% of the machinery costs has been subsidized (see Annex 2). Similarly, interested VDCs receive government fund for organic agriculture. So, if we trace the history of policy favoring organic agriculture in Nepal, we have no good reason to complain on government efforts to *promote* organic agriculture in Nepal for *export* in the era of industrial agriculture; but if we expect the full potential of organic agriculture to *change the agricultural system*, the government could have been done much more.

[16] Maheshwor Ghimire, Organic Inspector for Nepal of the NASAA, USDA-NOP, JAS; personal communication

Although, there are numbers of sectorial policies and standards that support organic agriculture (see Table 1), these are fragmented, unclear, and much more export oriented. The four principles of organic agriculture – 'the principle of health', 'the principle of ecology', 'the principle of fairness' and 'the principle of care' are missing in most of the Nepal's policy documents. Much more emphasize is given towards 'economy' and 'export' rather than 'ecology' and 'farness'.

Table 1. Summary of Nepal's policy related to sustainable agriculture

SN	Policy	Focus on organic agriculture	Effects on organic agriculture
1	Agricultural Perspective Plan 1995	Against the organic agriculture, however prioritized IPM	Negative
2	National Fertilizer Policy 2002	Against the organic agriculture, however prioritized IPM	Negative
3	National Coffee Policy 2003	Promotes organic coffee, but priority is given for 'export' and 'incomes' rather than environmental conservation.	Positive, and export oriented
4	National Agricultural Policy 2004	Encouraged organic agriculture and provides support for export.	Positive, but export oriented
5	Agribusiness Policy 2006	Demarcates production area for organic agriculture	Positive, but no implementation at al.
6	Agricultural Biodiversity Policy 2006	Regulates GMOs and promotes organic agriculture	Positive for biodiversity conservation
7	Trade Policy 2009	Supports organic certification and promotes organic tea, coffee, honey and vegetables for export	Positive, but export oriented
8	Nepal Trade Integration Strategy 2010	Seven agro-food items are listed for export, and priority is given for organic products	Positive, but export oriented
9	Climate Change Policy 2011	Introduced agriculture insurance for climate affected areas	Silent on organic agriculture
10	Agricultural Development Strategy 2014	Emphasized on organic branding for export, promote bio fertilizers, and focus on improving soil organic matter. No ban on the chemical fertilizers, pesticides, and hormones.	Positive and also export oriented. No clear vision on organic agriculture in Nepal.
11	National Standards of Organic Agriculture Production and Processing 2007	Sets rules and regulation for organic products, established national level governing body, and sets priority agro-commodity for organic export.	Positive, but lacks clarity, mostly qualitative, and tedious to follow all rules
12	The 9th Plan	Emphasized on IPM and IPNMS	Silent on organic agriculture
13	The 10th Plan	Introduced the term 'organic farming' in policy, promoted IPM, IPNMS.	Coined the term, nothing more
14	The 11th Plan	Envisioned to make Nepal as organic Country, and plans for new policy; but still focused on export	Positive, but export oriented; however it envisioned "Organic Nepal"!
15	The 12th Plan	Emphasized organic products through prioritizing organic fertilizer factory,	Positive, but no implementation

		facilitating product branding and certification, and demarcation of organic production area	
16	The 13th Plan	Promotes organic agriculture through facilitating branding and certification - so export priority	Positive, but export oriented

There is no clear vision of government for sustainable agriculture in Nepal. For example, contrasting policies have been formulated – the government has subsidized synthetic fertilizers at the one hand, and at the other hand, it promotes organic agriculture. There is no clear demarcation of the organic agriculture from the conventional agriculture. Also there are limited applications of science-based practices (lack of action research). Some challenges such as tedious certification process, high costs of certification by foreign organizations, and problems in record keeping in case of participatory certification systems; lack of suitable product markets, and no long-term vision of the government on the use of chemical fertilizers and pesticides are observed. There are lack of knowledge, political advocacy, and commitment from the high level officials on organic potentials - which could be the major constraints for future organic agriculture development in Nepal.

It needs to taken into account that the organic producers get economic returns not only as price premium, but also based on the ecosystem services provided by them such as amount of carbon conserved. They should be allowed in the concept of 'payment for ecosystems services through increased environmental health and carbon conservation'. Preparation of good agricultural practices, good collection practices, good manufacturing practices, good processing practices and good marketing practices are recommended for organic products. In addition, clear regulatory frameworks, national and international market facilitation, sufficient funding for research, extension and educational activities, as well as penalties for environmental harmful inputs and fraud marketing of the organic products should be implemented.

At present, the organic agriculture is prioritized for 'export' so that only large farms or elite people are benefited; but we need to go for mass agriculture with radical rethinking in favor of smallholdings. It is of high importance to demarcate area specific to organic production and prioritize homegrown fruits and vegetables at first. For demarcating organic production areas, priority should be given to the 'virgin' lands in remote parts of Nepal, and then later on the hilly regions of the mid-hills. Without food security there is no other kind of security. And without sustainable agriculture, there is no food security. And we believe organic agriculture is the only means for sustaining agriculture and so all forms of life on earth. Also it is of prime importance to initiate organic agriculture under the defined production area for the defined markets. Because the levels of logistic requirements, quality assurance, price premium and competition differs according to the markets (see Figure 5). Not only government should look into these markets, but also farmers must cultivate organic products targeting these; and accordingly the standards imposed for organic products need to be differ.

Finally, we are very hopeful about the future of organic agriculture in Nepal. Because, mainstream agronomists, those once favored 'green revolution technologies' are now worried about the negative consequences it caused to the environment and thus, they are also searching for the long-term sustainability of the agriculture. However, the mind of 'new agronomist' yet needs to favor the broader aspects of organic ideology: - social justice and animal welfare. But elements of the organic philosophy are starting to be deployed in mainstream agriculture making it more sustainable – making it one of the best alternatives to the industrial agriculture (Macilwain 2004). The ECA

developed by ANSAB, but yet in the production model farm – does favor organic philosophy. In addition, it favors landscape ecology, social cohesion and agribusiness entrepreneurship – which could be the one of the option for future agriculture of Nepal.

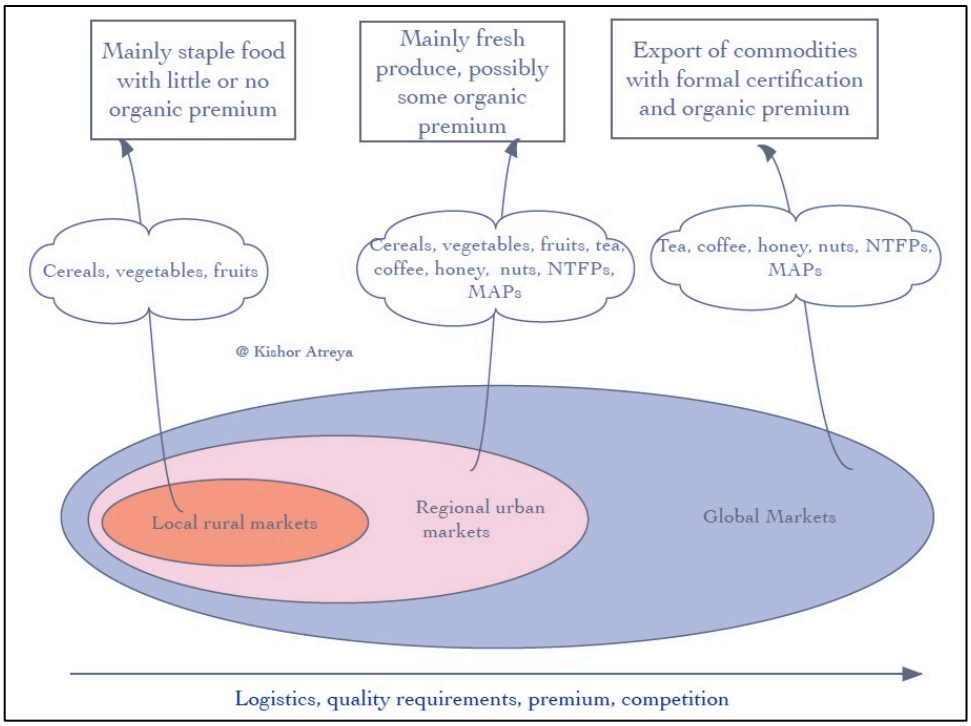

Figure 5. Characteristic of local, regional and global markets for organic products

For the future organic agriculture or ECA development, the following recommendations are made.

1. Make clear vision on sustainable agriculture and formulate a separate national policy on sustainable agriculture.
2. Demarcate production pocket areas and develop model farm in each of the production area. Define commodity and market for organic agriculture in each production areas. Phase out chemical pesticides and fertilizers from the production pocket areas!
3. Restructure existing body of organic coordination committee, and institutional arrangement
4. Ensure timely availability of organic seed, quality organic manure and other inputs to farmers and farmers' group
5. Political and government commitment is required to launch a nationwide intensive campaign on organic farming. Media coverage can play an important role. Strictly follows IFOAM's principles of organic agriculture at the time of campaign.
6. Give priority to capacity building for farmers, implementing officers, agencies, and local government members. Suggest integrating programs and activities of various departments, agencies into a common goal.
7. Develop a simple national certification process applicable for all organic farmers
8. Provide financial incentives for promoting organic farming, converting agricultural land into organic, subsidy on third –party certification
9. Introduce organic farming in education institutions; reorient research, education and extension.

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Annexes

Annex 1
Name of the individual interviewed

SN	Name	Designation/Office	Remarks
1	Dr. Yubak Dhoj G. C.	General Director, Department of Agriculture, Hariharbhawan, Lalitpur	GoN
2	Mr. Durga Prasad Dawadi	Director, Chief Soil Scientist, Soil Management Directorate, Department of Agriculture, Lalitpur	GoN
3	Dr. Chandra Prasad Risal	Senior Soil Scientist, Soil Management Directorate, Department of Agriculture, Lalitpur	GoN
4	Mr. Tara Kumar Shrestha	Program Chief, Agricultural Commodity Export Promotion Program, Department of Agriculture	GoN
5	Mr. Tanka Prasad Upreti	Head of Secretariat, Nepal Permaculture Group (NPG), Babarmahal, Kathmandu	NGO
6	Mr. Suresh Karki	Proprietor, Ecovillage Agriculture Farm, Tikathali, Lalitpur	Private Farm
7	Mrs. Judith Chase	Proprietor, Everything Organic, Patlekhet, Kavre	Private Farm
8	Mr. Prem Lama	Proprietor, Ashapuri Organic Farm, Kavre	ECA Experimentation and Demonstration Farm
9	Mr. Maheshwor Ghimire	Society for Environment Conservation and Agricultural Research and Development (SECARD), Kathmandu	NGO/ Organic Inspector
10	Mr. Bhependra Nirajan	Earth Open Source, Nepal Program Director	NGO

Annex 2

Name of the organic fertilizer company and their production potential who received 50% subsidies from the Government of Nepal in factory establishment during 2067/68 and 2070/2071

SN	Year	Name of the company	Production potential (Metric ton/Year)	Production at present (Metric ton/Year)
1	2067/68	Bansun Agro Organic Pvt. Ltd., Jugedi, Chitwan	2000	
2	2067/68	Triveni Bioresearch and Development Centre Pvt. Ltd., Rampurtokni 3, Bara	1000	500
3	2067/68	Natural Microorganism Fertilizer Factory, Kotihawa, Rupendehi	300	300
4	2068/69	Dhanusha	500	
5	2068/69	Rautahat	500	
6	2068/69	Chitwan	5000	2000
7	2068/69	Rupendehi	2000	1000
8	2068/69	Morang	10000	3000
9	2068/69	Dhanusa	10000	1000
10	2069/70	Kathmandu	1000	300
11	2069/70	Rupendehi	1000	500
12	2069/70	Kavre	5000	1000
13	2069/70	Chitwan	20000	1000
14	2069/70	Kanchanpur	1000	
15	2069/70	Siraha	1000	
16	2069/70	Gorkha	300	300
17	2069/70	Udaypur	2000	
18	2070/71	Chitwan	1000	500
19	2070/71	Dang	1000	500
20	2070/71	Lalitpur	500	
21	2070/71	Biratnagar	5000	1000
		Total	70100	12900
		Average	3338.1	921.4

Source: Dr. Chandra P. Risal, Senior Soil Scientist, Soil Management Directorate, Lalitpur