Review of Agriculture Sector & Policy Measures for Economic Development in Nepal

Bimal Wagle, Prabhat 'David' Shrestha & Pradipan J. Thapa

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Contents

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Acknowledgement

This detailed study report on agriculture, which is one of the five sectors on the Nepal Economic Growth Agenda (NEGA) Report, 2012, would not have been possible without the input and help from a lot of individuals and organizations. First of all, we would like to thank all the five research guides working with research assistants preparing five reports like this. We cannot remain without thanking the authors of this report, Mr. Bimal Wagle, Mr. Prabhat "David" Shrestha and Mr. Pradipan J. Thapa for working on this study which remained a pillar behind the preparation of the NEGA Report 2012.

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July, 2012

Preface

The Nepal Economic Growth Agenda (NEGA) Report, 2012, which aims at contributing to create an environment for making better informed policy decisions concerning Nepal's economic growth scenario took its first leap in 2011 by working on key sectors that have important roles in initiating growth in Nepalese economy. After rounds of individual and group consultations for months since early 2011, five sectors were selected which were Agriculture, Education, Hydropower, Infrastructure and Tourism. Studies on all the five sectors were then carried out for a few months by a Research Guide and a Research Assistant and five detailed reports like this were prepared. On the basis of these five detailed reports on the five sectors, a single Nepal Economic Growth Agenda (NEGA) Report 2012 was prepared which was released in July 2012 and was handed over to the Nepalese government. With this, we as a policy think tank are making an effort to initiate the necessary change in the economy through the Nepal Economic Growth Agenda (NEGA), Report 2012.

This report, "Review of Agriculture Sector and Policy Measures for Economic Development" is an outcome of the study conducted on agriculture for the Nepal Economic Growth Agenda (NEGA), Report 2012, carried out by our Research Guide Mr. Bimal Wagle with Mr. Prabhat "David" Shrestha and Mr. Pradipan J. Thapa.

As the issue of economic growth is slowly finding its way into mainstream political discourse and discussion on priority sectors are ongoing, this report presents useful analysis on the current status and prevailing challenges in the sector. In this regard, the effort made through this publication takes the discussion one step ahead as it has made an attempt to look into the details and identify those constraints which have been keeping the sector from growing. The study looks upon the sector from the perspective of economic growth and recommendations

are based on how the sector can grow and consequently play a greater role in the larger economic growth of Nepal. Hence, the study has some key focus points.

Agriculture being the sector that contributes to one third of the GDP and employs two third of the work force, commercialization and increasing productivity remain two of the main issues in focus in this detailed study report. Some of the key challenges identified are lack of commercialization primarily arising from issues such as the lack of agro inputs (fertilizer, irrigation, etc.), market access and market development, risk management (insurance) and lack of research and extension. Hence, recommendations are proposed in increasing access to inputs, developing insurance programs, developing market centers and enhancing research and extension through private sector involvement.

Overall, the report outlines the key hurdles impeding growth and provides recommendations to remove the hurdles while introducing new ideas to build on the potential in this sector. With this, we believe this publication will be a key document to refer to in the process of policymaking to encourage growth. Samriddhi, The Prosperity Foundation will be publishing the Nepal Economic Growth Agenda on an annual basis highlighting important issues concerning Nepal's economic growth.

Abbreviations and Acronyms

ADB	Asian Development Bank
ADS	Agriculture Development Strategy
AEC	Agro Enterprise Centre
AIC	Agriculture Input Company
AICL	Agriculture Input Company Limited
APP	Agriculture Perspective Plan
BAFIO	Bank and Financial Institutional Ordinance
CBOs	Community Based Organizations
DADOs	District Agriculture Development Offices
DDC	District Development Committee
DFID	Department for International Development
DoA	Department of Agriculture
DoI	Department of Irrigation
DLS	Department of Livestock Services
FAO	Food and Agriculture Organization of the United Nations
FY	Fiscal Year
GDP	Gross Domestic Product
GoN	Government of Nepal
IAAS	Institute of Agriculture and Animal Sciences
IAU	Independent Analytical Unit
IFAD	International Fund for Agriculture Development
INGOs	International Non-Governmental Organizations
LDCs	Least Developed Countries
LSGA	Local Self Governance Act
MoAC	Ministry of Agriculture and Cooperatives
MoF	Ministry of Finance
NARC	Nepal Agricultural Research Council

NFC	Nepal Food Corporation
NGOs	Non-Governmental Organizations
NSC	National Support Committee
NSCL	National Seed Company Limited
PPP	Public Private Partnership
SFDP	Small Farmer Development Project
SAFTA	South Asian Free Trade Agreement
TVDP	Tribhuwan Village Development Programme
TYIP	Three Years Interim Plan
USAID	United Nations Agency for International Development
WDI	World Development Indicators
WTO	World Trade Organization
ZADOs	Zonal Agriculture Development Organizations

The Nepali year is based on the Bikram Sambat Calendar and is approximately 57 years ahead of the Gregogrian calendar (2062/1/1=2005/4/14)

List of Tables & Figures

CHAPTER I

Introduction

1.1 Background

Increase in agricultural productivity is considered to be vital for economic growth especially for a developing country like Nepal where much of the economy depends on agriculture. Emphasizing upon how agriculture forms a major part of the development economics, Theodore Schultz began his acceptance speech for the 1979 Nobel Prize in Economics by saying,

> *"Most of the people in the world are poor, so if we knew the economics of being poor we would know much of the economics that really matters. Most of the world's poor people earn their living from agriculture, so if we knew the economics of agriculture we would know much of the economics of being poor" (Shultz, 1979).*

Defined as "*the science or practice of farming, including cultivation of the soil for the growing of crops and the rearing of animals to provide food, wool, and other products*", agriculture is a major contributor to the socio-economy of developing economies. It is considered to be a critical component for economic growth, addressing hunger and alleviating poverty particularly in less developed areas of developing world and understanding the sector becomes essential in understanding the overall growth. There is a mass of evidence that increasing agricultural productivity has benefited millions through higher incomes, more plentiful and cheaper food, and by generating patterns of development that are employment-intensive and

benefit both rural and urban areas. More importantly, it has provided the spur to economic development outside agriculture where growth and job creation are faster and wages higher (DFID, 2005).

Like any other agrarian nation, agriculture has always been and is a major part of the Nepalese economy. It is still the prime source of income and employment for people, contributing to 35 percent of GDP and employing 66 percent of the total work force. Modern Agriculture development in Nepal started with the establishment of Agriculture Council in 1937 and Chandra Canal was constructed the following year with an attempt of institutionalizing development works in agriculture. However, desired changes were not obtained and only after the establishment of democratic political system in 1951 did foreign aid and aid agencies start to play a major role in the germination of national policies and planning (Dahal, 1997).

After the implementation of the First Five Year Plan in 1956, agriculture was identified as one of the top priority sectors for development. And after the formulation of the Fifth Five-Year Plan (1975-1980) agriculture has been given the highest priority because increasing the productivity of existing crops and diversifying the agricultural base for use as industrial inputs were realized as being essential for economic growth.

Despite the priority given to agriculture, a lot however, remains to be done. Farmers in Nepal still rely on traditional subsistence methods of farming and livestock rising. In the absence of technological advancement, farming is still labor intensive as it has been for a long time; and the percentage of work force involved in agriculture has only gone down by 24 percent from 90 percent forty years ago (Karkee, 2008).

1.2 Justification

Nepal being an agriculture based country, the agricultural sector has a significant role in alleviating poverty, stimulating economic growth and inducing positive multiplier effects on other economic sectors of the

country. This was true for many parts of Asia, where what is now known as the green revolution played a major role in reducing poverty (DFID, 2005).

Income generation, employment opportunities, and infrastructural development, are some of the issues directly related with the qualitative promotion of agriculture and the same has been asserted by numerous macro and micro level research studies conducted with a focus on the agricultural sector and its different aspects with the support from donor agencies/INGOs. This study has sought to entail applied conclusion and recommendations which would help fill the gaps in the existing macro level agricultural analysis. It will also aid policy makers, agriculture related direct/indirect entrepreneurs, academicians, and students in building a knowledge base.

1.3 Objectives

In view of attaining the theme of the study as discussed above; following are the major objectives of the study:

- To analyze the trends and patterns of the contribution of agricultural sector to the Nepalese economy along with its multiplier effects;
- To review policies / programs and institutional orientation and their efficacy in improving agricultural productivity in Nepal;
- To appraise the multifarious critical problems and challenges that Nepal has had been facing in the agricultural sector;
- To evaluate the multi-dimensional impacts of agriculture in the Nepalese economy, employment and others;
- To recommend applied policy prescriptions and programs.

1.4 Research Methodology

The study has been based primarily on the secondary sources of data/

information. A qualitative and numerical approach has been the main stay of the research. Data from the Ministry of Agriculture and Cooperatives, Economic Survey of the government of Nepal, publications of Nepal Rastra Bank, and publications/websites of agriculture related associations/ commissions/bureaus in the world have been used accordingly. Based on the data/ information thus obtained, the authors have analyzed and evaluated the concerns as outlined in the objectives and have also put forth relevant recommendations.

1.5 Limitations

The research is an independent task undertaken by Samriddhi, The Prosperity Foundation and is bound to the principles of the organization. Care has been taken to maintain the ethics of being independent and neutral throughout the process of the research study. Limitations in terms of time and finances have, however, been the major constraints. The fact that the study has been kept concise implies the end product might have missed out on details that a voluminous report would have had. In this study, the focus has been on food crops, cash crops, fruits, vegetables, livestock and fishery. Forestry sub-sector has not been included in this study.

CHAPTER II

Understanding Agriculture

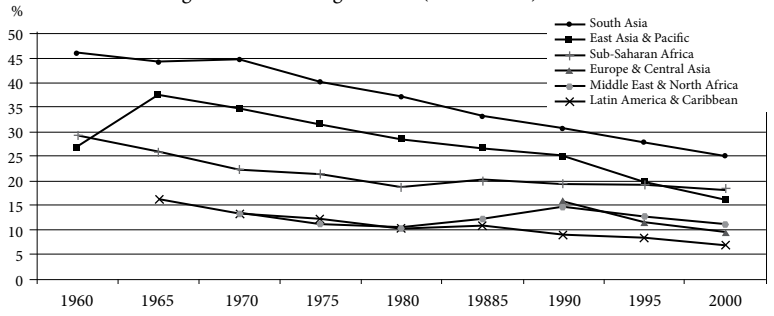
2.1 Role of Agriculture in Economic Development: Global Perspective

Much like in Nepal, agriculture has always been the prime source of income and employment for people in developing nations. It has been found that as countries go through a phase of development, there is a trend of diminishing dependence on agriculture and increasing reliance on other sectors of the economy. The role of agriculture in economically developed countries has taken a back seat over a period of time. In developing nations, however, agriculture has always been the key source of income—with a majority of the GDP being contributed and majority of work force being employed by this sector. But the process of globalization, industrialization, urbanization, and commercialization has meant that people working in this sector have eventually shifted or are shifting to manufacturing and service sectors.

Despite the fact that developing nations have always been heavily dependent on agriculture, the slow but gradual shift from being agro-centric to industry and service based economies has been evident. As countries become more economically developed, the share of agricultural contribution to the overall GDP decreases, as seen in the Fig. 1.

The contribution of agriculture to the GDP has decreased all over the world in the past forty years. Yet another observation that can be made is that the productivity for yields has been increasing, an example of which can be the increase in the productivity of cereals as shown in Fig. 2.

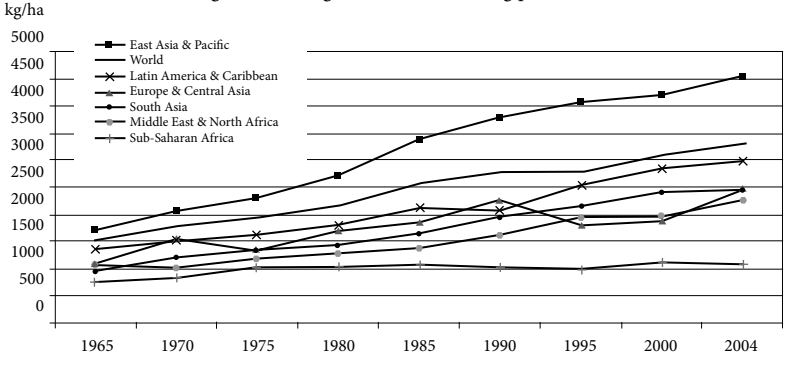
Figure 1: Share of Agriculture (value added) in GDP



Source: World Development Indicators (WDI), 2006.

As economies develop, the overall significance of the agricultural sector decreases but the productivity increases. Looking at the graphs above, it can be inferred that the development of the other sectors in the country has surpassed the contribution of agriculture to the GDP along with leading to an increase in productivity.

Figure 2: Average Yield of Cereals (kg per ha)



Source: World Development Indicators (WDI), 2006.

Another trend that can be identified is the growing number of people living in the cities. According to the data collected in 2006 by Food and Agriculture Organization (FAO) it can be interpreted that the number of people living in rural places of South Asia is almost 70% and the number

is estimated to decrease in the upcoming years (FAO, 2011). Thus, there are more poor people living in rural areas than in urban areas and there are more people who are involved in agriculture in the rural areas (IFAD, 2001). So, migration from rural to urban areas also results in laborers shifting from agriculture to other sectors.

Majority of the poor people in the world are involved in agriculture—about 53% of the total workforce in the developing world is involved in agriculture (Meijerink & Roza, 2007). But with the increasing trend of people migrating from rural places to urban, the number of people involved in agriculture has decreased globally over the past four decades. People have been shifting from agriculture to other sectors such as industry and service. The structure of the Chinese economy, as can be seen in the table below illustrates a glaring example of such a shift.

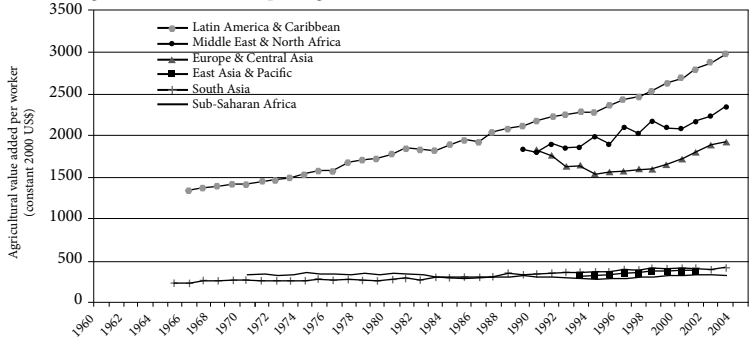
Table 1: Percentage changes in the structure of Chinese Economy (1970-98)

Share in GDP	1970	1980	1985	1990	1995	1998
Agriculture	40	30	28	27	20	18
Industry	46	49	43	42	49	49
Services	13	21	29	31	31	33
Share in Employment						
Agriculture	81	69	62	60	52	40
Industry	10	18	21	21	23	23
Services	9	13	17	19	25	27

Source: Journal of Agriculture and Social Research.

The overall scenario of level of agriculture in terms of value addition is not encouraging and there exists a significant gap between different regions. Regions where dependency in agriculture for livelihood of the poor is substantially high lag far behind in terms of economic growth. The graph below shows value added by workers in different regions of the world and it is evident that Asia and Africa have low levels of value added compared to other regions, signifying that these regions are primarily involved in subsistence agriculture.

Figure 3: Value Added per Agriculture Worker, in constant - USD 2000



Source: World Development Indicators (WDI), 2006.

Even with the majority of the population being involved in agriculture in regions such as South Asia and Africa, the value added by each worker has been significantly less in these regions, which brings out the issue of technological advancement and use of high-tech agriculture inputs in other regions.

Thus, the global trend of agriculture in developing world has seen a decrease in contribution of agriculture to GDP, decrease in the number of people working in agricultural sector and the eventual increase in productivity due to technological advancements. As developing countries move towards becoming developed, the service and industrial sectors have become the major contributors to GDP and the contribution of agriculture to the overall economic growth decreases.

2.2 Global Importance and Development of Agriculture

For developing nations, development of the agricultural sector is the key to economic growth as majority of its work force is involved in agriculture and the major chunk of contribution to GDP also comes from the sector. In agriculture based countries, 29 percent of the GDP is generated from the sector and 65 percent of the labor force is employed by

it; as for in transforming and urbanized nations the services linked to value chains often compromise more than 30 percent of GDP (The World Bank, 2008).

One of the many reasons as to why agriculture plays such a vital role in economic growth is that it provides for private investment opportunities. The sector has strong linkages with other sectors as majority of the agricultural products are of primary importance—the agricultural raw materials can be provided to agro-industries and other sectors of the economy. Improvement in the agricultural productivity, therefore, can have multiplier effects on other sectors. Another reason why the production of food grains is important is that agricultural productivity determines the price of food, which then determines the wage costs and therefore the competitiveness of the tradable sectors.

In liberal free markets the production of food supply and the demand for it determines the prices of the food. Countries that do not produce enough food or are reliant on imports to make up for the domestic demand are exposed to risks of food price rises and volatility. Food price inflation is transformed into non-food inflation and this happens particularly in poor countries. In developed countries one percent shock to food prices results in 0.15 percent increase in non-food prices, while in poorer developing nations the average is around 0.3 percent (Walsh, 2011). Therefore, in poor countries food prices have a stronger impact on the macro economic conditions than in richer countries.

Agriculture is still the tool to reduce poverty globally because 75 percent of the poor people, 2.1 billion living on less than US$ 2 a day and 880 million on less than US$ 1 a day, in developing nation live in rural areas and most of them still rely on agriculture for income (The World Bank, 2008). Agriculture solely is not a panacea for eradicating poverty but considering the number of poor people in the world who are involved in agriculture, it can certainly be used as a tool to reduce poverty and bring about development and hence improvement in the quality of rural life.

The production of agricultural products is important for food security because it is a source of income for majority of the rural poor. Places with very high population, high variable domestic production and inability to import food due to foreign exchange constraints are prone to food emergencies and with food aid uncertainty, it is imperative to increase domestic production for self-sustainability (The World Bank, 2008).

Agriculture is the source of income for 1.3 billion small land holders and landless farmers and source of livelihood for 86 percent of the rural people (Karkee, 2008). With a majority of the poor dependent on agriculture, improvement in agriculture productivity can improve the quality of life of the poor. Three billion people, almost half the number of people in the world live in rural areas and the decline in USD 1-a-day poverty rate from 28 percent in 1993 to 22 percent in 2002 has been due to the improving conditions in rural areas as a result of having prioritized agriculture.

2.3 Current situation of agriculture in Nepal

Agriculture contributes to one third of the GDP and employs two thirds of the work force in Nepal. In the Mid-Western and Far-Western development regions, agriculture generates three quarters of the employment—agricultural activity being the lifeline for poor households. Nepal being a rural society based on agriculture, improving outputs and income in the agricultural sector of the country is a prime necessity.

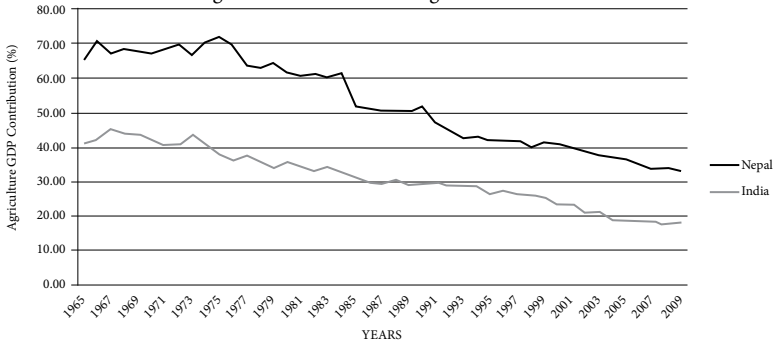
Nepal's agriculture is mainly subsistence, as no more than 15 percent of the output is commercialized (Karkee, 2008). With the average land holding sizes being 0.8 ha and almost half of the population owning land less than 0.5 ha, low input farming systems are typical pattern with almost 82 percent of the cultivated area containing water-intensive crops such as paddy, rice, wheat and maize.

Growth in agriculture has been relatively slow as opposed to the rapid population increase. As agriculture in Nepal is mostly water intensive

and heavily dependent upon natural rainfall, present yields of rice, wheat and other crops have been well under Asian averages. The reasons behind poor land and labor productivity are numerous—lack of market information, farmers not having access to markets, lack of research and extension, poor technology, little use of fertilizers and improved seeds, lack of access to credit and too much dependence on natural rain water.

With a decline in the number of people working in the agricultural sector, the contribution of this sector towards total GDP has been decreasing alongside as shown in Fig 4. Over the span of almost thirty years, contribution of agriculture to the GDP has gone down by almost 40 percent.

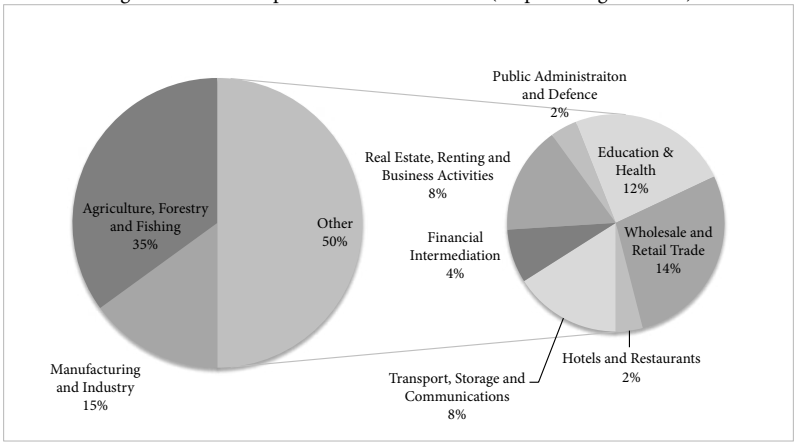
Figure 4: Contribution of Agriculture to GDP



Source: World Development Indicators (WDI, 2006

As it stands, 50% of Nepal's GDP is dependent on the service sector, whereas 15% is dependent on manufacturing sector which employs only one third of the labor force. The number of people working in the agricultural sector is predicted to go down, but today with around 8.4 million people involved in agriculture, it is still a huge number with a labor force of about 12 million (GoN, 2008).

Figure 5: GDP Composition Fiscal Year 2011 (As percentage of GDP)



Source: Nepal Economic Update, September 2011, The World Bank

Agriculture has been the least productive sector in case of Nepal. Currently, a majority of the labor force is involved in agriculture compared to other service based and industrial sector; however, Nepal's agricultural productivity is one of the lowest in South Asia (The World Bank, 2008).

2.4 Agriculture-based country

The share of agriculture in growth and rural share in poverty recognizes three different types of countries: agriculture based, transforming and urbanized. Agriculture-based countries' major source of economic growth is agriculture with almost 32 percent of the GDP being contributed by the sector on average and 3.3 million households in the rural areas being involved in agriculture (The World Bank, 2008). In transforming countries, agriculture is no longer the main source of economic growth, contributing to about 7 percent of GDP growth, but poverty still remains in rural areas. Finally in urbanized countries agriculture on average accounts to 5 percent of the GDP and the sector contributes very less to economic growth.

Neighboring nations—India and China transformed from being agriculture based economies to being urbanized economies. Over the last

twenty years Nepal's dependence on agriculture has also been declining but the pace has been very slow and Nepal still dominantly remains an agriculture based economy.

Table 2: Characteristics of 3 country types in terms of share of agriculture in growth (2005)

	Agriculture-based countries	Transforming countries	Urbanized countries
Rural Population (millions), 2005	417	2,220	255
Share of population rural (%), 2005	68	63	26
GDP per capita (2000 US$), 2005	379	1,068	3,489
Share of agriculture in GDP (%), 2005	29	13	6
Annual agricultural GDPgrowth, 1993-2005 (%)	4.0	2.9	2.2
Annual nonagricultural GDPgrowth, 1993-2005 (%)	3.5	7.0	2.7
Number of rural poor (millions), 2002	170	583	32
Rural poverty rate, 2002 (%)	51	28	13

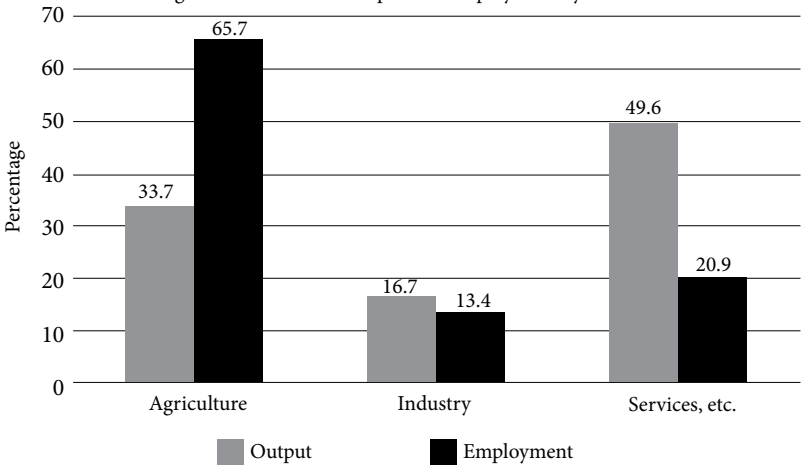
Source: Ravallion, Chen, and Sangraula 2007; World Bank 2006.
Note: Poverty line is $1.08 a day, in 1993 purchasing power parity dollars.

Two thirds of the labor force in Nepal has been involved in agriculture and yet the returns have not been substantial. Productivity and income of small household farmers needs to be increased through the transformation of subsistence farming to commercial farming.

The process of transformation of the developing nations into developed ones entails that the work force gradually shift from the agriculture sector to service and industry based sectors. The number of people engaged in agriculture had declined by only 7 percent between 1961 and 2002 (Neupane, 2011). The change has indeed been slow. The transformation of workers from agricultural sector to industry and service based sectors would provide manpower to other sectors hence facilitating

economic growth but given that agriculture is still the growth driver in the country, it is very important to allocate resources properly in other sectors along with transforming the current traditional systems of agriculture in order to increase productivity.

Figure 6: Structure of Output and Employment by Sector



Source: World Development Indicators, 2010

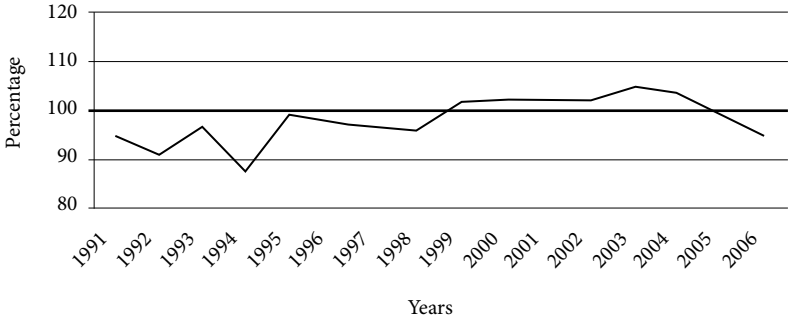
Structural changes in the economy, labor shift from agriculture to other sectors has stimulated economic growth in different parts of the world and therefore the future goal should be to decrease the number of people involved in agriculture and increase productivity simultaneously.

2.5 Sub-sectors of Agriculture

Nepal has been richly gifted in terms of its scope for agricultural diversity owing to the variation in topographical, altitudinal and temporal aspects. Agriculture in Nepal can be divided into the following sub-sectors: food crops, cash crops, other horticulture (fruits and vegetables), livestock production, fishery and forestry.

Food crops: Food crops signify the combination of five main crops - paddy, maize, millet, wheat and barley. Nepal's agriculture is heavily inclined towards food crops, but ironically the country still faces problems of self-sufficiency (USAID, 2010). During years of deficits, the shortage of food grains has ranged from 22 thousand tons to 485, while surplus has ranged from 68 thousand tons to 213 thousand tons (USAID, 2010). A growth of 4.1 percent in Fiscal Year 2011 from 1.6 in Fiscal Year 2010 has been reported in agriculture due to the improvement in weather (The World Bank, 2011).

Figure 7: Food Grain Self-Sufficiency Ratio %

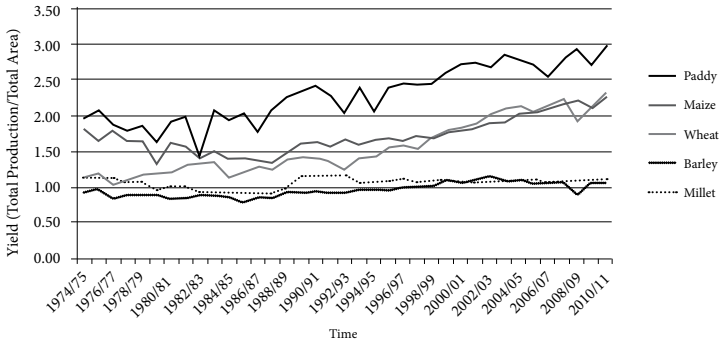


Source: USAID Agriculture Report

The average annual production of food crops is estimated to be around 8.6 million tons for the fiscal year 2010/2011, of which paddy alone makes 4.4 million tons, maize takes up 2.06, wheat 1.70, barley 0.029 and millet 0.30 million tons.

Paddy is the most important crop in Nepal and has been contributing to almost half the production of food crops in Nepal. This crop is planted in June-July and is harvested during October-November. Similarly maize is considered the second most important crop in Nepal, which is mainly planted in the hilly regions of the country. Another summer crop millet is also planted in the hilly and mountain regions and is harvested around November (USAID, 2011).

Figure 8: Food Crop's Yield



Source: Economic Survey, 2010/11, Ministry of Finance

According to the Fig 8, over the period of last three decades paddy productivity and production has been increasing significantly compared to other food crops due to better techniques and as paddy is a water intensive crop, Nepal is a perfect location for paddy farming as the yearly monsoon brings plenty of water.

Cash Crops: The major cash crops that are planted in Nepal are sugarcane, oil seeds, tobacco, potato jute and pulses. In 2011, the area cultivated by sugarcane increased by 7 percent to 65,000 hectares because farmers were attracted to farming sugarcane due to the rise in its price and consumption (GoN, 2008).

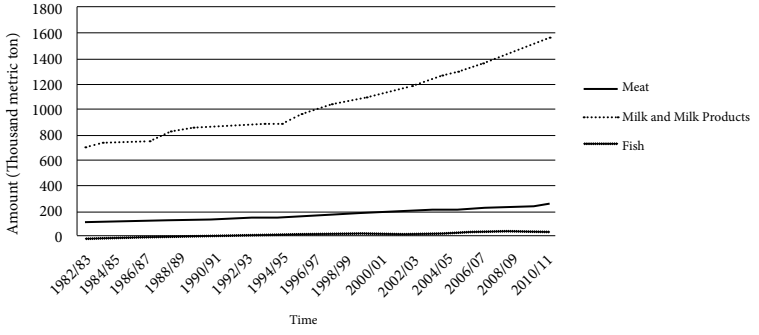
Horticulture (Pulses, Fruits and vegetables, others): Horticulture is one of the major sub-sectors of Nepalese agriculture as it contributes about 14 percent to the total agricultural gross domestic products (USAID, 2011). Understanding the role of horticulture in Nepal, the Agriculture Perspective Plan (APP) targeted the growth rate of horticulture GDP to be 5.5 percent per annum by 2014/2015. Vegetables have the most important contribution to the total horticultural GDP, as currently out of the 200 species of vegetables grown, 50 are grown on a commercial scale in Nepal.

Off-season vegetable farming is the production of vegetables after the normal season of production. Due to Nepal's unique geographic structure, winter vegetables can be grown in summer time in the hilly regions. Due to the short supply of off-season vegetables, demand is high and with the resulting high prices farmers' income has gone up alongside. The ability to produce off-season vegetables in a large scale can give Nepal an opportunity to export the same to the Indian markets. Exporting vegetables to India during the main season of production is impossible because India produces vegetables in a large commercial scale (FNCCI, 2009).

Livestock: Livestock production is an important agricultural sub-sector of Nepal as it accounts for almost 29 percent of the agricultural GDP and about 11.5 percent of the total GDP (Goletti & Grunh, 2001). Livestock production forms an essential source of meat, milk, and manure for farm and the livestock sub-sector continues to be important contributor to the Nepalese economy.

The share of total livestock as a share of agriculture GDP had only increased about a percent during the 1990s, but livestock has grown at a rate of 3 percent from 1990 to 2000. Even though during the given timeframe livestock production has grown it has been a considerably slow growth when compared to other sectors like fisheries and cash crops.

Figure 9: Livestock Production



Source: Economic Survey, 2010/11, Ministry of Finance

In the 1990s, there were about 3.3 million buffalos in Nepal and the population continued to grow at a rate of 1.9 percent (Goletti & Grunh, 2001). In the recent years, buffalo and pig meat production has increased due to increasing demands in restaurants and hotels and for private home consumption. However, the production of sheep and ducks has been slowly declining, mainly because consumers are shifting their meat preference.

The livestock sector contributes to nearly one third of the agricultural GDP and the dairy sub-sector contributes to more than half of the livestock sector, with a yearly production of 1.35 million metric ton of milk (Goletti & Grunh, 2001). Out of the total milk produced more than two thirds is buffalo milk and the rest comes from cows. This highlights the importance of buffalo and cows in the agriculture sector.

Table 3: Average annual prices for selected food commodities, 1971/1972 - 2009/10

	1971/72	1981/82	1991/92	1991/72	1971/72
Chicken	8.96	24.61	69.87	133.23	249.22
Egg	0.43	0.97	2.42	4.53	8.61

Source: Agricultural Marketing Information Bulletin (Special Issue-2010), Ministry of Agriculture and Cooperatives
Notes: Chicken - NRs. per Kg; Egg - NRs. per egg

Another important component of the livestock sub-sector is poultry production. Backyard poultry is an ideal way for people in rural areas to make cash but 50% of poultry production has been taken over by the commercial sector (Sharma, 2010). The demand for poultry and especially chicken meat and egg has gone up drastically as reflected by the change in prices over the past three decades (refer to Table 3).

Fish: The fisheries sub-sector has had a very limited role in the overall Nepalese economy and it contributes only 1.5% to the agriculture GDP (2011) and about 2% of the total population benefit from the fish industry (FAO, n.d.). Nepal holds potential to develop the fish industry as it has many rivers with constant supply of water from the Himalayas, a significant amount of small lakes, and many ponds and paddy fields suitable for fish farming. The production in fishing industries, however, has been very slow in relation to the production of meat and milk products.

CHAPTER III

Review of Agriculture Plans, Programs and Policies

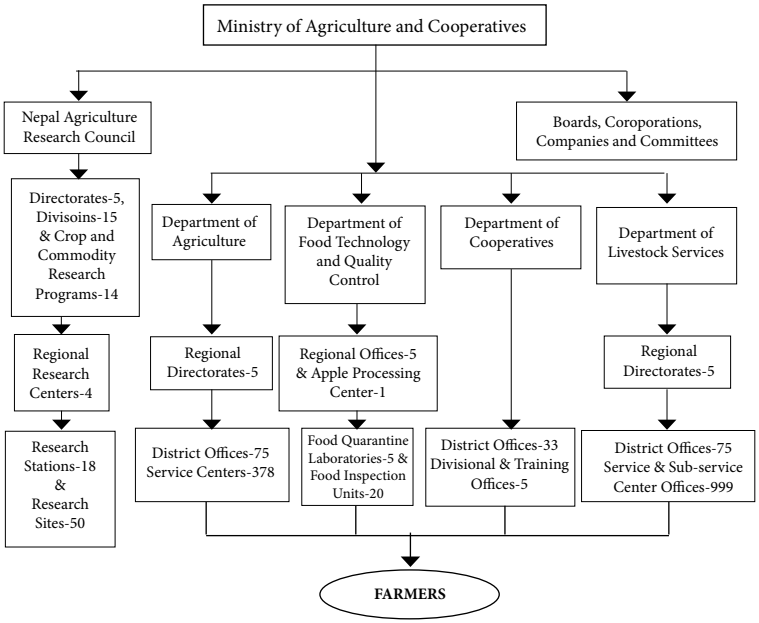
Planned development of Nepalese agricultural sector began in 1951 with the establishment of Department of Agriculture (DoA) and in 1965 DoA was transformed into five departments as Department of Agriculture Extension, Department of Fishery, Department of Horticulture, Department of Animal Health, and Department of Agriculture Research and Education. Over a period of time, the structures have been integrated and disintegrated and currently there are four departments, Nepal Agricultural Research Council (NARC), Boards, Committees and Corporations under the Ministry of Agriculture and Cooperatives (MoAC).

Being the leading employment provider and GDP contributor, agriculture has always been prioritized as one of the key sectors for development in the past periodic development plans. The current agriculture situation has been a result of past policy changes and program implementations. A good deal of efforts have been put in for the development of agricultural sector through policy changes, program implementations and periodic development plans that have been made in the past.

3.1 Periodic Development Plans

Ever since the first five year plan (1956-1961), the government has been allocating funds for agriculture development. In the first five year plan with the total budget allocation being NRs. 576 million for development, agriculture including village development was prioritized and 20 percent of the total budget expenditure was allocated in this sector. The fourth five

Figure 10: Major public sector organizations for agriculture development in Nepal



Source: Ministry of Finance

year plan (1970-1975) saw a total expenditure of NRs. 3.3 billion, out of which 26 percent of the budget was allocated for agriculture. In the following fifth five year plan, priority was given to cash crops such as sugarcane and tobacco and this was for the first time that poverty was mentioned as a problem in a five year plan.

Barley, millet and wheat were other crops that made small contribution to the agricultural sector, but the production of cash crops such as sugarcane, oil seed, and tobacco had increased considerably in the 1970s. With the increasing production of cash crops, agricultural production grew at an average rate of 2.4 percent annually from 1974 to 1989. However, it couldn't keep up with the increasing population, which was increasing at a rate of 2.6 percent during the same period. During the late 1980s, almost 75% of total

export was agricultural products, most of which was exported to India. The following section carries a short description of the five year plans.

3.1.1 The Fifth Plan (1975- 1980)

The fifth plan targeted an increase in GDP by 5 percent and aimed at increasing the agriculture output by 19.2 percent. But due to constraints such as dependence on unpredictable weather, limitation of irrigational land and modernization and developmental process of agricultural sector falling behind schedule food grain production was limited. Irrigation facility was targeted to expand to 146,000 hectares, but an expansion of upto only 95,425 hectares was achieved and only 48 percent of the targeted 20,000 trees were planted.

3.1.2 The Sixth Plan (1980-1985)

During the fiscal year (FY) 1980/81, GDP increased by 8.30 percent and increased again by 3.80 percent in FY 1981/82. The production of food grains and cash crop was expected to increase annually by 2.80 percent and 3 percent respectively during the plan period, but except in the fiscal year (FY) 1982/83 and FY 1984/85, production of food grains exceeded the target for each year. In the FY 1982/83, food grain production declined by 10.20 percent due to late monsoon and inadequate rain.

3.1.3 The Seventh Plan (1985-1990)

Before the introduction of the Panchyat system, the irrigation facility was only available to 11,428 hectares (ha) of land. Due to heavy investment in agriculture during the *Panchyat* system irrigation facility was made available to a total of 539,039 ha of land. But despite the emphasis given to the irrigation facilities the economy could not benefit from the investments made because certain projects did meet up the expectations after the completion and more attention was geared towards repair and maintenance of those completed projects.

3.1.4 The Eight Plan (1990-1995)

During the Eight Plan period, agricultural growth target of 3.7 percent was not achieved as agricultural production saw a growth of a mere 3 percent. Also the target to increase food crops production by 400,000 metric tons annually was not received. The productivity of all crops in the last year of the plan period was lower than the target and the reason was that the supply of fertilizers was not satisfactory along with the fact that the supply of improved seeds and plants was not effective both in terms of quality and quantity.

3.1.5 The Ninth Plan (1995-2000)

The Ninth Plan targeted to achieve an annual economic growth rate of 6 percent by achieving a 4 percent growth in the agricultural sector. There, however, was low productivity due to adverse weather which shrunk the growth rate to 3.3 percent. During this plan (1997-2002) the government decided to implement a twenty year-long Agriculture Perspective Plan with the aim of improving agriculture production by transforming the practice of subsistence farming into commercial farming.

The weakness in terms of the implementation of the Agriculture Perspective Plan, loss of production in the first and last year of the period due to bad weather and lack of investment in the non-agricultural sector due to insurgency were the main reasons for not achieving the total economic growth target.

3.1.6 The Tenth Plan (2002-2007)

During the Tenth Plan period, the average growth remained low at 3.4 percent against the targeted growth rate of 4.3 percent. The average annual growth rate of the agricultural sector was projected to be 3.6 percent but a growth rate of only 2.7 percent was achieved.

Overall, it can be said that agricultural production was not encouraging during the first, third, fourth and fifth year of the plan because of unfavorable weather. Due to past efforts of developing the agricultural sector, there was a gradual transformation from subsistence to commercial farming. Production of cash crops increased due to the coordinate mobilization of research, dissemination, markets, business promotion, food technology and quality control, supply of inputs and rural infrastructure construction.

With the government's decreasing role in provision of services, the presence of cooperatives, private and community organizations helped increase the production of consumable goods. At the end of the plan, there still existed food problems in hill areas and the other major problems were crop intensity reduction, inadequate supply of chemical fertilizers, improved seeds, and irrigation loans and other basic agricultural inputs, ineffective mechanism for agricultural extension and lack of needed agricultural researches.

The tenth plan (2002-2007), being the country's Poverty Reduction Strategy Paper pressurized to raise the output of the sources of the agricultural production by incorporated use of the inputs and services as visualized by the APP.

3.1.7 Three Years Interim Plan (TYIP) (2007-2010)

After the People's Movement of 2006 the TYIP set a long-term vision of achieving annual average growth rate of 3.6 percent in the agricultural sector and 6.5 percent in the non-agricultural sector respectively. However, a mere estimated growth rate of 3.3 percent was achieved during the plan period primarily due to adverse weather conditions.

3.1.8 Three Years Plan (2010-2013)

The long-term vision of the Plan is to create a prosperous, peaceful country and to transform Nepal from a least developed country (LDC) to a

developing nation within two decades' period. The objective of this plan is to increase food production and raw materials required for agriculture and livestock based industry, enhance storage capacity of agriculture, increase foreign exchange reserve through the export of agricultural commodity, use modern equipment for food research, ensure the enforcement of WTO standard in the export-import of food production and use modern technology for the quality fixation of agro-industry.

3.2 Agriculture Perspective Plan (APP)

The Agriculture Perspective Plan (APP) was drafted as a 20 year plan starting from 1995 and is the government's primary policy for agriculture modernization and growth. As agriculture is recognized as being the main sector of the rural economy, the APP was drafted with a goal of reducing poverty from 49 percent to 14 percent in 20 years' time and increasing agricultural growth from 3 to 5 percent annually (Yadav, 2006).

The implementation of APP indicates that the government has been prioritizing agriculture development through modernization and growth. APP focuses on technology driven growth. It prioritizes technology, electrification, roads, irrigation and fertilizers as its input priority and high value crops and agri-business as its output priority. The Ministry of Agriculture and Cooperatives (MoAC) designed a "pocket package approach" in 1998 to implement the Prioritized Productivity Package (PPP) of the APP. So by identifying certain high value agriculture areas, limited resources would be allocated to those areas first. The APP has strategized to focus on high-value commodities which use less land in the hills and mountains, whereas in the Terai region the strategy is technology driven and focuses on development of ground water.

APP was prepared with the technical assistance from the Asian Development Bank (ADB) to be implemented from the Ninth Five Year Plan (1997-2002) and in 1996 a National Support Committee (NSC) was established at the National Planning Commission (NPC) to overlook the implementation of APP. Also, an Independent Analytical Unit (IAU) was

formed at NPC under ADB's guidance, which basically acted as a secretariat to the NSC. The main goal of IAU was to monitor the implementation of the APP.

APP has had support of political parties, aid agencies, line ministries and key stakeholders, but it has not been devoid of criticisms. The APP has recognized that the development of agriculture depends on the development of other sectors such as road, electricity, irrigation, forestry and soil and water conservation with linkages with the agriculture sector. However, because of the inability of various Ministries and Departments such as Agriculture and Livestock to work together, the implementation process has been stalled which is why investment in the agriculture sector has been less than the amount anticipated by APP. APP as a package plan has also been criticized owing to the lack of prioritization and also lack of implementation at the local levels.

APP has also been criticized for not being able to address the problems of small, marginal and landless farmers. Recently, farmers have also protested against their voices not being heard in the drafting process of the Agriculture Development Strategy (ADS), a 20 year agriculture vision document that will guide the country's agricultural sector after the current APP ends in 2015. The government has allocated a fund of about NRs. 160 million for the development of ADS in the next two years.

3.3 National Fertilizer Policy (2002)

The fertilizer policy is sub-component of the government's initiative namely the National Agriculture Policy as set out in the Agriculture Perspective Plan. After 1997, Nepal followed an open market policy which attracted the private sector in fertilizer trade. The main aim of the National Fertilizer Policy was to support agricultural production by ensuring production, import and distribution of fertilizers. Eventually, the goal was to improve soil fertility which would result in improvement of the agricultural productivity and ultimately alleviate poverty.

This policy aimed at making sure that fertilizers were available, the process of fertilizer distribution was effective, competitive and transparent, quality fertilizers were used and the integrated Plan Nutrients System was managed. The government established a Fertilizer Unit in the Monitoring and Evaluation Division of MoAC in 1997 after it decided to deregulate fertilizer trade. The main aim of this unit was to provide guidance to the fertilizer sector after the process of deregulation. In 2004, the name of the unit was changed to Agriculture Input Supply Monitoring Section with a purpose of including other agricultural inputs along with chemical fertilizers in the monitoring system.

As the roles were set by the Fertilizer Order (1999) the established Fertilizer Unit was supposed to monitor changes in the fertilizer sector in order to create a healthy financial and environment friendly fertilizer supply system. The main focus was to make sure that the farmers were using fertilizers as targeted by the Agriculture Perspective Plan. Also, after the deregulation of fertilizers, the Ministry of Agriculture and Cooperatives wanted private sectors to be involved in the fertilizer trade. As Agriculture Input Company (AIC) was the sole public provider of fertilizers, this policy sought to make ways for private companies to be able to compete equally. Under the Company Act 1996, AIC was terminated and two companies namely Agriculture Input Company Limited (AICL) that was responsible for fertilizer business and National Seed Company Limited (NSCL) that was responsible for seed business came into existence.

The primary objective of these policies was to attract private companies but the rise in price of fertilizers in the international market meant that the farmers could not afford such inputs and the increase in illegal activities across the border with India meant that farmers were buying subsidized fertilizers from India. All this made it tough for the private sectors to sell their products. Private companies were not able to provide quality fertilizers at an affordable rate and hence the government decided to provide subsidy on mineral fertilizers in 2009 (Shrestha, 2010).

3.4 Irrigation Policy (2003)

The major goal of the policy was to be able to provide year-round irrigation facility with effective utilization of existing resources, to develop institutional capacity of water users for sustainable management of existing systems and to improve potential of the technical human resources, water users and NGOs related to the development of irrigation sector.

Nepali farmers are heavily dependent on rain water which makes it very tough to produce agricultural products around the year without the development of proper irrigation systems. To reduce poverty and to reach the goals set by the APP, the extension of irrigation services is a very important step. It is crucial to be able to use ground and surface based water irrigation systems along with the utilization of other methods like rain water harvest, sprinkle, pond, drip and treadle pump irrigation. Traditional methods of getting water from river systems and rain water also hold a key to developing good storage systems to aid irrigation during the dry seasons and periods with rain water shortage.

This Irrigation Policy was not fully aligned to the legal framework provided by the Local Self Governance Act because the divisional concept of the Department of Irrigation (DoI) underestimated the District Development Committees' (DDC) role and responsibilities, role and responsibilities of the Divisional Office and the local bodies were not appropriately identified and also because District Technical Officers were overburdened with irrigation and other infrastructural works undertaken by the DDC (Narma Consultancy & Seeport Consultancy, 2006). It can be interpreted that the weakness in irrigation policy was that it was not supportive of the LSGA structure. Along with it, the lack of defining the roles and responsibilities hindered the processes of governance and implementation.

3.5 National Agriculture Policy (2004)

The National Agricultural Policy 2004 focused on commercializing agriculture. The policy divided farmers into two categories—small and big. Through the plan the government tried to provide more assistance to poor farmers (those who own less than four hectares of land). The main aims of the policy were to make agriculture flourish both in the domestic and international markets through commercialization, to augment agricultural production and productivity and to properly utilize the natural resources.

Both the types of farmers—the ones who have access to resources and the ones who have low access to means and opportunities have been facilitated by this policy. The policy has also focused on improving agriculture production and productivity, protecting and promoting the use of natural resources without having adverse environmental effects and building a commercial and competitive agriculture system.

3.6 Agro Business Promotion Policy (2007)

Agro-Business Promotion Policy was devised in 2007 with a goal of transforming subsistence farming into modern, sustainable, competitive and commercial production system. Some of the points addressed by this policy were emphasis on growth centers, establishment of agro-product areas and business centers, and the development of required infrastructure for agro business development.

This policy highlighted the development of infrastructure as the main focus for commercialization. Also with Nepal's entry into WTO, it emphasized the importance of developing market network and partnership of both government and private sector to promote the export of quality goods and also to encourage domestic markets.

3.7 Commercial Agriculture Policy (2007)

The Ministry of Agriculture and Cooperative (MoAC) introduced a policy to enhance the process of commercialization and the ministry also

planned to lease open government owned lands to landless farmers for cooperative and commercial farming practices.

The government, under this policy, encouraged commercial herb farming and cooperative animal husbandry by marginalized communities such as *Kamaiyas* in 22 districts. It also focused on the cultivation of off-season vegetables for generating income for underprivileged people. The main aim of the policy was to aid poor farmers and underprivileged women's groups by lending goats in 30 districts and helping in the operation of fisheries along the highways of Kailali and Kanchanpur. This policy also entailed the expansion of tea cultivation and plantation of off-season vegetables in the eastern districts and coffee cultivation in the districts of western hilly region.

3.8 Government's efforts for land reform in Nepal

Land reform is not a new issue in Nepal. Overall, the main end to be achieved through land reform is to make sure that everyone has sufficient and equitable access to land and when it comes to agriculture, having access to land is one of key necessities for any farmer. Some of the major land reform changes that have been made in the past have been briefly discussed below.

Table 4: Land Tenure Before 1950

Forms of Tenure	Area (hectares)	Percentage of Total Area
Raikar	963,500	50
Birta	700,080	36.3
Guthi	40,000	2
Kipat	77,090	4
Rajya, Jagir, Rakam etc.	146,330	7.7
Total	1,927,000	100

Source: High Level Land Commission, 2051 (1995), Report of high level land reform (Badal) commission. Kathmandu.

During the 1950s a series of land Acts were implemented which only retained the *raikar* (state owned land rented to tenants) and *birta* (state-offered lands to private individuals). Before the Act was passed during the 1950s other forms of tenure such as *jagir* (current government employees), *rajya* (royal vassals and former rulers), *guthi* (religious and charitable institutions) and *kipat* (communal land ownership) existed (Neupane, 2011). Table 4 shows how large portions of land in Nepal were owned by the state.

After the first government was elected in 1951, land reform was initiated and *birta* was eliminated by the Birta Abolition Act 1959, but land owning elites still had control over land (Wily & Chapagain, 2008). The Land Reform Act of 1964 fixed ceilings on the land individuals could own, protected rights of tenants, fixed agricultural rent and got rid of high interest rates for rural loans. After the adoption of the Land Reform Act of 1964 the government achieved land egalitarianism but such reforms caused land fragmentation and the average land holding size decreased from 1.11 hectares in 1961/1962 to 0.66 hectares in 2003/04. 57% of the farmers own less than 0.5 ha of land whereas 16% don't own any land at all (Neupane, 2011). With the issue of hand holding taking a front seat the process of commercialization has been hindered as large scale farming cannot be made possible with small land holdings or no access to land at all.

3.9 Credit for agriculture

In 1967, under the Agriculture Development Bank Act 1967, Cooperative Bank became the Agricultural Development Bank and was to be the main finance provider for cooperatives and small agri-businesses. Seventy-five percent of the bank was owned by the state, 20 percent by Nepal Rastra Bank and remaining 5 percent was owned by cooperatives and private individuals. The Land Reform Savings Corporation was merged with Agriculture Development Bank in 1973.

The Agriculture Development Bank Limited has been executing Small Farmer Development Project (SFDP), the major poverty alleviation program in the country. However, by 1990 this bank had only funded 9

percent of the total number of farming families since 1965. This bank has been involved in commercial banking since 1984 and with the enactment of Bank and Financial Institutional Ordinance (BAFIO) in 2004, all Acts related to financial institutions including Agriculture Development Bank Act 1967 were abolished. After being a public limited company in 2005, Agriculture Development Bank Limited has been operating as an "A" class financial institute. With a premium rural credit institution turning into a commercial bank, the task of getting access to capital has been made tougher for farmers.

3.10 Trade Policies

Nepal and India have concluded very important treaties such as Nepal-India Trade Treaty 1996 which was renewed first in 2002 and again in 2009. Nepal trades the largest volume of goods with India and Nepal also has the largest trade deficit with India. The implementation of Nepal-India trade treaty of duty free market access for agricultural and primary products along with open border has created concerns for products and inputs, both through formal and informal channels (FAO, 2011). Due to the open border, India poses a very tough competition to Nepalese agriculture as Indian imports are produced by more advanced technology and thus it benefits a lot from the considerable subsidies and economies of scale. The Nepal-India treaty does not prevent Nepal from introducing para tariffs on imports from India, but as Nepal has been a part of the WTO since 2004, commitments have been made not to use such measures post 2012.

The South Asian Free Trade Agreement (SAFTA) was a treaty that was signed in January 6, 2004. It sought to slowly abolish most tariffs and other trade barriers on products and services passing between Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Afghanistan and Sri Lanka. But as of now SAFTA has not been of any significance for trade (FAO, 2011). The reasons behind it being—Nepal's main market is India, market access provisions in Indo-Nepal treaty are far superior to those under SAFTA. Due to these reasons Nepal has not been able to export any goods under SAFTA.

3.11 Extension reforms

Agriculture extension service is a major step taken by the government to educate, disseminate information and support the livelihoods of Nepalese farmers. The government has implemented several extension models and approaches with donor support or its own resources since 1950 (Sharma, 2010). The extension service providers in Nepal can be identified as governmental, community based organizations (CBOs) such as farmers associations and cooperatives, developmental and institutional organizations [Institute of Agriculture and Animal Sciences (AAS), National Agriculture Research Center (NARC), NGOs, training institutions, vocational trade schools] and private service providers (contractors, consultants, processor, traders).

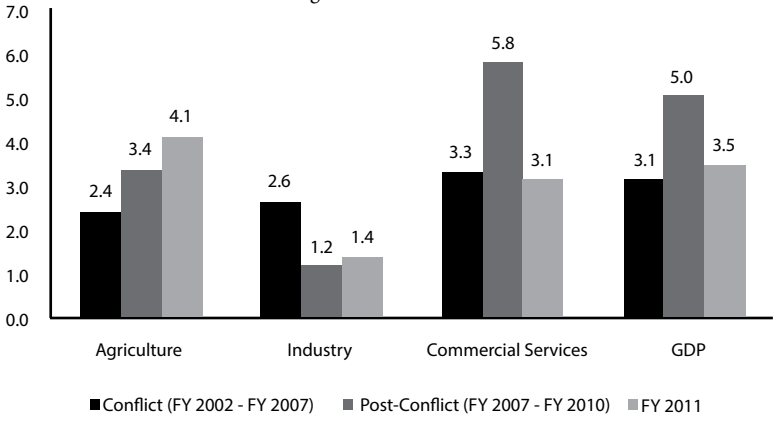
The agriculture extension program was included as a built in component of the comprehensive Tribhuwan Village Development Program (TVDP). It was the part of the village development program where promotion of agriculture was given the main priority. Subsequent approaches followed in agriculture extension included the establishment of Zonal Agriculture Development Offices (ZADOs) and District Agriculture Development Offices (DADOs) and recruitment of field level extension workers who were to make farmers aware and have them adopt new technologies. However, majority of the farmers could not be reached because the poor and deprived communities had no access to the extension services. It was also due to the limited number of field level extension workers. Other drawbacks were the limited resources in terms of technical advice, production inputs and credit, and service in remote areas.

CHAPTER IV

Review of Challenges and Problems

The performance of the agricultural sector has not been up to the required standards in the recent years. If we look at the overall economic growth rate, it has decreased from 4.8 percent in 1990s to 3.2 percent during 2001-2006 (Karkee, 2008). As for the agriculture growth rate, it was 2.7 percent per annum during the 1990s and 2.8 percent during 2001 to 2006.

Figure 11: Growth Rate



Source: World Bank, Nepal Economic Update, 2011

Post conflict years of 2007-2010 saw an average growth rate of 3.4 percent while in the year 2011 a significant increase to 4.1 percent was seen

owing to the favorable weather conditions. Paddy, which contributes 17 percent of agriculture value added, saw an improvement in production due to improved rain. Nepal's agriculture production is heavily dependent on natural rainfall and even with the growth in the production of crops the outputs are still below standards when compared to countries like India (Uttar Pradesh, Punjab), Vietnam and China.

With implementation of plans, programs and policies in the past, Nepal's agriculture sector has had a slow and steady growth and has mostly been unable to meet the set targets. Some problems that have and are still hindering the process of growth in the agricultural sector and eventually the overall economy are discussed below.

4.1 Inputs

One of the key issues in the agricultural sector is the lack adequate access to agricultural inputs. Inputs are what go into the farm and it can also be classified into two groups—physical inputs and human inputs. Examples of physical input are weather, climate, relief, soil, geology and latitude, which farmers have little control over. However, human inputs such as machinery, fertilizer, pesticides, seeds, livestock, animal feeds and workers can be controlled by the farmers.

Fertilizers: Chemical fertilizer is an important input for agriculture production and Nepal does not produce any fertilizer. Nepal completely imports chemical fertilizers and majority of it is imported from India. Nepal saw a period of government subsidizing fertilizers from 1973 to 1997 and a period of deregulation from 98 to 2008 (Shrestha, 2010). Good quality fertilizers were supplied when the government provided fertilizers but then supply was hampered due to the lack of budget allocation. Farmers had to wait for long durations to get subsidized fertilizers from the government and people with close political affiliations were the ones who were prioritized. Due to the existence of such a process, that was both long and biased, farmers opted to cross borders to India and buy fertilizers in informal ways. Even today we see a large fraction of unofficial fertilizer trade taking place

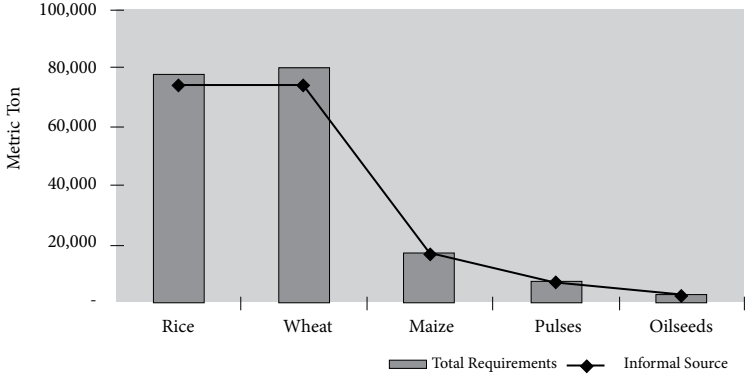
with India. On the other hand, when fertilizers were deregulated supply no longer remained an issue but then the quality of fertilizers became questionable. The private companies involved in fertilizer trade could not compete against the ever increasing illegal import of subsidized fertilizers from India.

Nepal is not capable of producing its own fertilizers as it has no raw feed stock or materials. Also it is costly for Nepal to produce and compete against neighbors such as India owing to the lack electric power. Adding to it is the small demand for fertilizers in the domestic market with respect to an economic size of the fertilizer plant. All these deter private companies from wanting to invest in the sector.

In order to interest private companies Fertilizer Control Order 1999 and National Fertilizer Policy 2002 were implemented. But the main problem for private competitors was the rise in price of fertilizers in international market which meant that the farmers here could not afford such inputs and the increase in illegal activities across the border with India meant that farmers were buying subsidized fertilizers from India which was making it very tough for private sectors to sell their products. Private companies were not able to provide quality fertilizers at an affordable rate. Due to these reasons, the government decided to provide subsidy on mineral fertilizers on 2009.

Seeds: In 2002 the government converted Agriculture Input Company (AIC) into Agriculture Input Company Limited (AICL) and National Seed Company Limited (NSCL) under Company Act 1996 (Shrestha, 2010). NSCL produces, procures, processes, stores and sells wheat, rice, maize, lentil, jute and vegetable seeds for agriculture production. Besides this public company in Nepal, majority of the seeds used by the farmers are those saved and stored from the previous harvest or obtained from countries nearby. Due to this reason the seeds have adapted to local conditions and are resistant to diseases and insects but have low yield potential. Agricultural productivity can only be increased with the availability of improved varieties of seed stocks.

Figure 12: Informal Sector's Share in the Total Seeds' Requirements by Crops, 2008/09



Source: Annual Progress Report and Statistical Book of Crop Development Program – 2064/065. Crop Development Directorate/Department of Agriculture

The problem with the supply of seeds is that even with considerable number of support activities available in seed production and distribution over the years, the informal seed supply system has been dominating. As more than 90% of the cereal seed requirements are met by the informal sector, this sector lacks the supply of good quality seeds. Fig 12 shows the total seed requirement and the share of the informal sector (GoN, n.d.).

Irrigation: The development of irrigation system in Nepal has been very slow due to reliance on shallow tube wells and lack of proper maintenance of irrigation facilities, farmers rely heavily on natural rainfall for irrigation.

Out of the total area of 2.60 million hectares (ha), only 1.80 million ha, 66% of the total area gets irrigated throughout the year, out of which 1.40 million ha lies in the Terai or Plains (GoN, 2011). The remaining 0.40 million ha is in river valleys, upland valleys, and terraces on hills and mountains (GoN, n.d.). Farmers manage 75% of the irrigated areas while the Department of Irrigation (DoI) manages the remaining 25%. The main source of getting ground water is through shallow tube wells, mainly in Terai, and only 0.25 million ha of land has been irrigated using groundwater

in Terai and that is only a quarter of the 1 million ha of Terai land that could be developed. Therefore, it is clear how farmers are heavily dependent on natural rainfall.

The major problem with the irrigation system is the inability to utilize groundwater properly. Nepal is rich in water resources but due to the lack of electricity and fuel and their high expenses it is very tough for farmers to extract water from the ground on their own. As one of the key factors that determine the crop production amount is the quantity of rainfall farmers are always at risk.

4.2 Credit

The productivity of agriculture is also dependent on easy access to credit and farmers still face the constraint of accessing credit for agriculture in the country. In the past we have seen different forms of rural credit systems being developed followed by the development of private and institutionalized credit sources. Agriculture Development Bank was established in 1967 with an objective of providing financial assistance to cooperatives and small agri-businesses but from 1984 this development bank got involved in commercial banking. With decrease inn farmers' access to capital and with commercial banks providing micro credit loans and agriculture loans with 15-20% interest rate the times have been tough for farmers.

In 1975, the Small Farmers Development Program (SFDP) was implemented by the Agriculture Development Bank of Nepal and this was the first time that group based lending had started in Nepal. But eventually the performance of SFDP failed due to political pressure for hasty expansion, failure to follow the law, and overemphasis on credit.

Agriculture credit has been subsidized in the past and still continues to be so but according to the Credit Survey conducted by Nepal Rastra Bank in 1980, almost 80 percent of the loans have gone to large farmers and the results of Nepal Agriculture Sector Review has also been the same.

Handling agriculture loans for banks is expensive, as compared to the large farmers who are taking advantage of the subsidized loans.

4.3 Research

Although a country-wide network of agricultural research and extension systems exists in the public sector along with other service providers in the private sector including NGOs only about 20 to 25 percent farmers get effective coverage (Karkee, 2008). The problem with the current research system is that it is inclined towards cereal crops and therefore is unable to act according to the demand of high value agriculture and come up with ways to avoid risks of crop failure and post-harvest marketing losses.

In Nepal, private sector accounts for less than 1 percent of total public and private spending on agriculture. A number of NGOs that are active in agricultural research are entirely funded by foreign donors and mainly focus on rural development.

4.4 Extension

Agricultural extension in Nepal is dominated by the activities of the two departments under the Ministry of Agriculture and Cooperatives—Department of Agriculture (DoA) and Department of Livestock Services (DLS). Despite many encouraging evidences with regard to the performance of public sector in the agricultural extension, the agricultural extension is often criticized for its strong technology transfer and for the failure to contribute to sustainable agricultural growth. Problems such as the following are often noted with regards to Nepal's public sector agricultural extension:

- Inadequate funds for operational purposes
- Domination of supply driven approaches rather than demand driven ones

- Failing to cater the needs of the specialized client and demand for location specific extension services as required by the commercialization of agriculture
- High cost and low impact of extension programs
- Insufficient face-to-face contact between extension workers and farmers

MoAC's efforts to facilitate the evolution of self-standing and self-sustaining groups and their empowerment to become self-reliant and capable of articulating their needs and problems effectively have been hardly matched by resources, opportunities and capacities of the public extension system. Furthermore, the current extension system is still out of reach of majority of the people. The extension worker: farmer ratio has also been very disproportionate.

4.5 Supply Chain

The agriculture supply chain system involves interconnected stakeholders such as farmers, middlemen, businesses and everyone who involved in the production and provision of products that reach the consumers in the end. In context of Nepal the development of the agriculture supply chain has been slow which has been causing inefficiencies in the market. The following are some of the supply chain problems that hinder the development of agricultural sector.

4.6 Market Accessibility

One of the problems that farmers face is the lack of access to market and this can be attributed to poor infrastructure development in the country. Road development has been taking place but there is a shortage of roads that connect farmlands to the market place. When farmers don't have access to the market they either have to transport the products themselves or rely on middlemen. Farmers who can't transport goods on their own

usually end up selling their products at very low costs that consumers pay high final food prices for due to unavoidable costs incurred by the coming in of the middlemen (Shrestha, 2005).

Due to remoteness economic, growth in the country has been hindered especially in the agricultural sector. Connectivity is necessary for overcoming remoteness and mainly for diversification and commercialization of agriculture because small farmers are scattered in different places of the country. The average time required for rural households to reach markets is usually long, as, on an average household are required to spend more than 3.5 hours to reach the nearest bus stop and over 2 hours to reach the nearest agricultural center and market center (Karkee, 2008).

The development of market infrastructure is still perceived as a public sector responsibility but owing to the budgetary constraints of the government there has been minimum development in this regard. There have been instances where market infrastructures like collection centers, *Haat Bazaars*, wholesale and retail market centers developed in public areas have been abandoned within a few years of their operations because of the inaccessibility of the places (Shrestha, 2001).

4.7 Market and Crop Failure Risk

Failure to produce enough quality crops can be said to have been caused due to unfavorable weather, lack of quality input supplies and diseases. Market failure, meanwhile, can be said to have been the result of not being able to sell the produced amount due to limited market access. Farmers in Nepal face dual risk in this regard—risks of crop failure and also the market failure. This problem, in the long run, can discourage farmers from producing at a large scale and may eventually deter people from being involved in agriculture.

With the rural-poor being involved in agriculture, market and crop failure risks can be very discouraging for farmers who have limited

resources and have invested their life savings in the production. Both in Nepal and India, there have been many cases of farmers committing suicides because of failure in producing enough and hence not being able to pay back their creditors on time. The process of farmers taking loans from banks, not producing enough and eventually not being able to pay loans is a vicious cycle experienced by many rural farmers.

Analysis of district-level crop production and yields reveal that summer monsoon paddy is at risk of flood and drought in several districts and despite the fact that overall mortality rate for livestock is not available, evidence suggests that mortality rate for cattle and buffalo are between 2 percent and 3 percent (The World Bank, 2009).

The exposure to such problems and risks has been hampering the total production potential of the agricultural sector. As farmers have to face the risk of market and crop failures, they are less encouraged to produce in a larger scale and would only produce at a subsistence scale (FNCCI, 2009). Farmers are not willing to produce at a larger scale or are looking for employment in other sectors or foreign land. If the government and private sector want to increase agricultural production by commercializing agriculture, then such institutional problems that discourage farmers should be mitigated.

4.8 Storage Problem

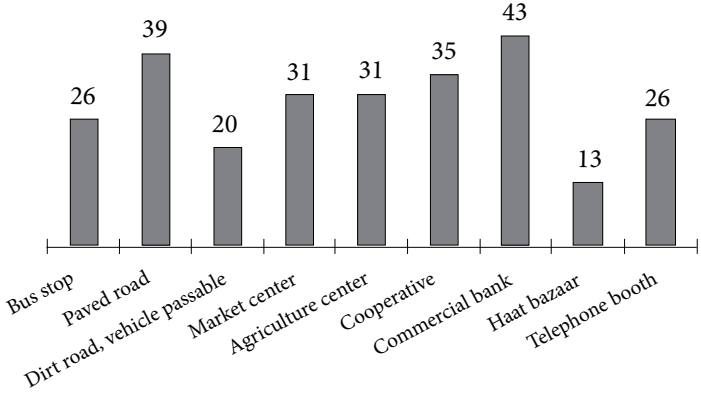
Another major problem is the loss of products during the post harvesting process because of lack of proper storage methods and inefficient handling and packaging mechanisms. Post handling losses in off-season vegetables make up almost 25 to 50 percent of losses which create supply side pressure on prices (USADI, 2011). Farmers who transport products to the market on their own lack proper tools to transport and without proper storage and freezing systems food products go to waste. The farmers hence are faced with two choices—either sell their products at low prices to middlemen or let the products go to waste.

4.9 Lack of Information

In the past, the Department of Agriculture (DoA) had taken the responsibility to give out information of some agricultural commodities through Radio Nepal but currently Agro-Enterprise Center (AEC) and other organizations have initiated support by providing information of prices through various F.M. stations and daily newspapers. Marketing Development Directorate and Agri-business promotion of the DoA publishes information on the prices of agricultural commodities in the Agricultural Marketing Information Bulletin. However, such coverage has weakness in terms of covering all the commodities in the market, analyzing the prices, broadcasting timing and reaching the information and publication (Shrestha, 2001).

It is just not market prices of agricultural commodities that farmers don't have access to. In rural areas farmers have very limited access to technology and internet. The government has not established information centers at local district and village levels. Training and access to advanced technology could have been vital for farmers in acquiring information on improved methods of agriculture, input supplies etc.

Figure 13: Percentage of households more than two hours from the nearest facility



Source: CBS, NLSS 2003/04

From Fig. 13, it can be interpreted that almost 40 percent of the rural households live more than two hours away from paved roads, more than 25 percent live two hours away from nearest telephone booth or bus stop, less than 33 percent of the households are two hours away from market center and agriculture center.

4.10 Food Prices

Due to the rising food prices poor people in the country have been hit the hardest and the purchasing power of the people has been weakened due to increasing energy prices. It is a vicious cycle as people are being able to purchase less with their money, rising food prices have been causing inflation, and it is becoming very hard especially for the poor to survive.

There are various reasons why food prices have been increasing so rapidly. One of the main reasons is the increasing energy costs which then increases the transportation cost as almost 90% of the food is imported from India. As energy prices increase the prices of inputs such as fertilizers and irrigation also increase. Another reason is that during times of less rainfall, food production is less and therefore supply side shortage increases the prices. Due to lack of irrigation development, our farmers still heavily depend on rainfall which is why prices are determined by the amount of rainfall. From Table 5 we can see how there is a direct relation between amount of rainfall received and average yields of selected cereal crops.

Also, one of the main factors that determine food prices as seen in Table 5 is increase in population. The population of the country has been increasing rapidly and as the production of food has not been able to meet the demand of people, prices have been going up.

4.11 Trade problems

Nepal trades the largest volume of goods with India and Nepal also has the largest trade deficit with India. Because of the open border policy

Table 5: Factors contributing to price fluctuations

Fiscal Year	Total Cereal Production ('000 metric ton)	Population (million)	Use of chemical fertilizer (metric ton)	Average annual rainfall (mm)	Average yield rates of selected cereal crops (metric ton per hectare)		
					Rice	Wheat	Maize
1971/72	3442	11.56	NA	NA	1952	933	1730
1981/82	3983	15.02	23817	1910	1970	1320	1580
1991/92	5464	18.49	72719	1576	2280	1360	1590
2001/02	6965	23.15	19713	1901	2730	1890	1830
2002/03	7077	23.70	38950	1831	2670	2010	1880
2003/04	7463	24.24	11711	2092	2860	2090	1910
2004/05	7477	24.80	18458	1845	2780	2130	2020
2005/06	7365	25.34	8136	1689	2720	2070	2040
2006/07	7044	25.89	12751	1533	2560	2160	2090
2007/08	7778	26.42	3285	2096	2770	2220	2160
2008/09	7822	26.92	3157	1895	2900	1930	2200
2009/10	7762	27.50	42178	2095	2720	2130	2120
2010/11	8566	28.04	29604	1894	2980	2310	2280

Source: Economic Survey, Fiscal Year 2010/11

with neighboring India, Nepal has major concerns in terms of informal trade and inability to compete with India's competitive agricultural products. Due to open border, India provides very tough competition to Nepalese agriculture as Indian imports are produced by a comparatively advanced technology and it benefits a lot from the considerable subsidies and economies of scale. As a member of the WTO, Nepal has not able to introduce para tariffs on Indian imports, therefore Indian products that are produced with highest technologies and subsidy support are prioritized. As 90 percent of the agricultural products are imported from India, farmers in Nepal are discouraged from production at a commercial scale as the market is controlled by Indian products (GoN, 2011).

Another problem is that the South Asian Free Trade Agreement (SAFTA) has not been of any significance for trade as market access provision in Indo-Nepal treaty are far superior to those under SAFTA. Owing to this Nepal has not yet exported any good under SAFTA. The opportunity to trade with other countries should be explored as it can be vital and exporting agricultural products to other markets besides India can provide better access and market for domestically produced goods.

CHAPTER V

Conclusion and Recommendations

Agriculture sector in Nepal is, without doubt, a critical driving force for economic growth and for substantially alleviating poverty. Realizing the importance of this sector for overall development of the country, tremendous amount of resources are mobilized both internally and externally. Each periodic plan has accorded due priority to agriculture development. In reality, however, there seems to be a substantial gap between investment and outcome. In this regard, there exist both policy and implementation gaps. Given the existing situation of agriculture sector in Nepal the following basic policy conclusions can be derived:

- Agricultural growth is necessary for alleviating poverty in a sustainable manner;
- Agriculture growth is hindered by inadequate agricultural infrastructure;
- Public sector/state institutions alone or in isolation are not sufficient in facilitating agricultural growth;
- Agriculture sector can't grow without the support and coordinate efforts between the private and public sector.

Considering these policy conclusions as a premise, the following recommendations have been drawn to improve the productivity of the agricultural sector.

5.1 For a long-term sustainable growth, the public sector should focus on the commercialization of agricultural sector rather than merely supporting the current subsistence level farming. This can be done by enabling and encouraging private sector to move the sector towards commercialization and ultimately industrialization.

5.2 To create an environment for commercialization of the agricultural sector, and simplified processes for the agro entrepreneurs to lease smaller farms and to benefit from the economy of scale should be introduced. Tools like 'contract farming' should be made accessible through policies and regulations.

5.3 Policies that provide subsidies at the cost of entrepreneurship should be avoided. The subsidy on chemical fertilizers should be removed gradually such that the private sectors will be encouraged to invest in the procurement and distribution of chemical fertilizers which would in turn increase the accessibility of farmers to agro-inputs. However, an effective and efficient quality control mechanism has to be set up in the country. Furthermore, organic fertilizers should be manufactured in the country itself.

5.4 Risk management systems like crop and livestock insurance systems should be introduced by the public sector and the private sector should be encouraged to do so too. This would create a proper environment for financial institutions to invest in the agricultural sector and make access to credit easy for farmers.

5.5 In order to avert the larger challenge of labor shortage technical advancement and mechanization of modern farming system should be highly promoted. The farmers then need to be educated about it. Customs duty relaxations and tax exemptions should be introduced in the import of agricultural tools to encourage the introduction of advanced mechanization of the agricultural sector.

5.6 The problem of lack of proper storage facilities and cold storage

can be overcome by providing tax subsidies and cash incentives to the private sector or by investing in Public-Private Partnership (PPP) model for construction of such facilities and storehouses in strategic market centers throughout the country.

5.7 "*Mundi*" system as implemented in India should be introduced in various parts of the country to create more organized market places with easy access to market producers. This system will also provide an environment for the farmers where they can receive competitive market prices as per the demand. This will also help solve the problem of lack of market information among farmers.

5.8 The accessibility of information and technology to the farmers of high value crops, value addition of agricultural goods, regional market demand-supply status, information and communication technology etc. should be increased exponentially with combined efforts from the public, private sector, NGOs and INGOs.

5.9 The budget for agricultural research and extension should be increased and the private sector should be involved and encouraged in the process.

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Samriddhi, The Prosperity Foundation an introduction

Samriddhi, The Prosperity Foundation is an independent, non-partisan, not-for-profit, research and educational public policy institute based in Kathmandu, Nepal. As the name suggests, Samriddhi works with a vision of creating a prosperous Nepal.

Initiated in 2007, it formally started its operations in 2008. The specific areas on which the organization works are:

i. Entrepreneurship Development
ii. Improving Business Environment
iii. Economic Policy Reform
iv. Discourse on Democracy

Centered on these four core areas, Samriddhi works with a three-tier approach—Research and Publication, Education and Training, Advocacy and Public Outreach.

As per the above mentioned four core areas, Samriddhi has been performing educational programs and researches—publishing several books, handbooks, articles and other publications. Samriddhi is also known for creating a discourse on contemporary political economic issues through discussions, interaction programs and several advocacy and outreach activities. With successful programs like "Last Thursdays with an Entrepreneur", it also holds regular interaction programs bringing together entrepreneurs, politicians, business community, bureaucrats, experts, journalists and other groups and individuals making an impact in the policy discourse. It also hosts the secretariat of the 'Campaign for a Livable Nepal', popularly known as *Gari Khana Deu!*.

One of Samriddhi's award winning programs is a five day residential workshop on economics and entrepreneurship named Arthalaya, which intends to create a wave of entrepreneurship and greater participation among young people in the current policy regime.

The organization is also committed towards developing a resource center on political economic issues in Nepal with its Political Economic Resource Center (PERC). Besides this, Samriddhi also undertakes localization of international publications on the core areas of its work. Samriddhi was the recipient of the Dorian & Antony Fisher Venture Grant Award in 2009 and the Templeton Freedom Award in 2011.

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"Review of Agriculture Sector and Policy Measures for Economic Development in Nepal" is the detailed study report prepared on the agriculture sector for the Nepal Economic Growth Agenda (NEGA), Report 2012.

The NEGA Report 2012, being a consolidated document suggesting reforms on five key sectors of the Nepalese economy, is based on five detailed reports like this where the other four sectors are education, hydropower, infrastructure and tourism.

This study on agriculture has looked upon the sector from the perspective of economic growth and recommendations are based on how the sector can grow and consequently play a greater role in the economic growth of Nepal. Overall the report outlines the key hurdles impeding growth and provides recommendations to remove those hurdles while introducing new ideas to build on the potential in this sector.

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