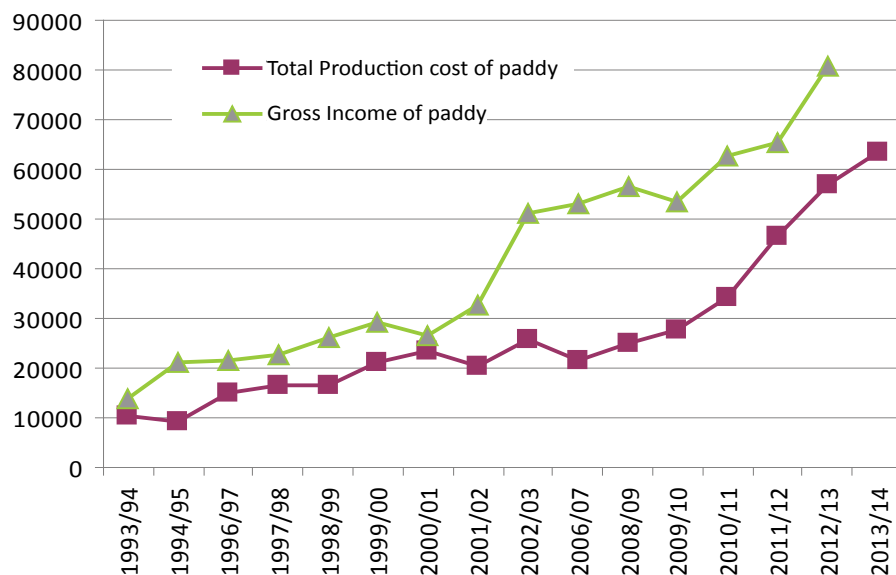


COST, PRODUCTION AND PRICE SPREAD OF CEREAL CROPS IN NEPAL : A TIME SERIES ANALYSIS 2071/2072 (2014/2015)



Netra Bahadur Bhandari | Dinesh Bhattarai | Maniratna Aryal



**Government of Nepal
Ministry of Agriculture Development
Department of Agriculture**

**Agribusiness Promotion and Marketing Development Directorate
Market Research & Statistics Management Program**
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FOREWORD

The present report "*Cost, Production and Price Spread of Cereal Crops in Nepal : A time series analysis*" is an attempt to find growth rate of major cereals production cost, price and wage rate during the period 1993/94 to 2013/14. The analysis is based on the compound growth rate of major cereals production. The analysis also includes an overview of inputs situation and cost per unit, as these factors are closely interrelated with production aspect. The data for the analysis was gathered through secondary sources of previous studies from this organization. Although, the present report provides a brief analysis of production cost trend, price of inputs and outputs and wage rate of labor of major cereals its findings can be a considerable help to the farmers, academicians, agricultural experts and policy makers, in acquiring general ideas relating cost of production, input and output price and wage rate and its trend of paddy, maize and wheat.



To help farmers in production planning and resource utilization, it is necessary to understand farm conditions under which they are operating. MRSMP has initiated to collect the summary and conclusion of the previous studies and trend analysis of cost, benefit, production and price of different commodities from 1993/94 to 2013/14. The trend analysis of cost items, production, benefits and price trend will provides the profitability of different commodities. We are trying to show the trend and replacement of manure, fertilizer, bullock labor, tractor use (mechanization) and production of different commodities of different district of 20 years. This report is published to help farmers, agribusiness operators, researchers, academicians, executives and policy makers.

I fully appreciate the efforts and hard works of staffs involved in field survey, data analysis and writing this report. Special thanks go to dedicated Agricultural Economist Mr. Maniratna Aryal for his hard work in producing this report. I am also thankful to Senior Statistical Officer Dinesh Bhattarai, Mr. Basanta Neupane and Mr. Ram Thapa for software design, data analysis, data entry and typing. I also acknowledge the help of all the staffs under this programme for their direct and indirect help in completing this study.

I welcome reviews, comments and criticisms on this report from the users so that we can improve it further in the coming years.

Thank you

Netra Bahadur Bhandari
For Chief

Ashad, 2072

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Chapter I

INTRODUCTION

1.1 Background

The importance of agriculture sector and its overall development is directly linked with the objectives of meeting basic needs of the people. Increasing farm production and farmers' income depend upon how the farmers plan and manage their farms. Farmers usually do production planning and management in their own judgment as per individual's family needs. However, they surely can maximize their farm income by adopting profitable enterprise. Management of resources for maximizing the returns and minimizing costs as well as improving the overall efficiency of farmers is the major concern of all the institutions involved in uplifting agricultural livelihood. Information on production cost is fundamental and is helpful to all the policy makers; agricultural scientist, researchers and farming communities including the farmers need to be aware.

Cost of production is an aggregate of fixed and variable costs incurred in crop production. There exists substantial gap in our knowledge concerning critical aspects of farmers' decision-makers regarding profitability. Managing capabilities of farmers get improved once they come to realize some facts through available information or documents. Data on cost of production can help farmers in their decision making process during the selection of profitable business. Farmers get knowledge of profitability in growing different suited to different agro climatic conditions by comparing the cost of production of different crops as well as other farming activities. Trend analysis of cost of production and gross income of cereal crops is the first attempt to publish in a compile form. This report also collects the summary of previous research reports from 1972/73-2013/14.

The cereal crops cultivated in Nepal are Paddy, Maize, Wheat, Buckwheat, Millet and Barley. Among these food crops rice, maize and wheat are indeed important

components of the food requirement in the county. The cultivation of rice and wheat is practiced at lower elevations and in valley bottoms in the mid hills and in all areas of Terai. In most of these areas, rice-rice-wheat cropping is usually followed. In this cropping sequence early paddy are cultivated. In the mid hills and high hills, instead of two rice crops, maize cultivation is practiced. It is the major crop in the hills, grown mostly on rain-fed land occupying more than one third of the cropped area. In majority of the areas, three crops among these cereals are grown in sequence if the temperature, climate and soil are favorable.

The area cultivated under paddy, maize and wheat shows that paddy is the most important food crop in terms of area coverage. Maize is the secondary crop and wheat occupies third cereal crop in terms of area cultivated. Similarly, the productivity of paddy is highest followed by maize and wheat.

Agricultural land cultivated in Nepal in is 30,91,000 hectares, of which a higher percentage of the area is covered by paddy (48%), maize and wheat both in area and production in 2013/14. Food shortages time and often in the past have reiterated the importance of agricultural development in Nepal. Rising agricultural productivity is one of the policy priorities of the government for attaining food security and alleviation of poverty in the years to come.

The production of food grains for consumption is dominant among the farm households. There are many remote areas where due to high transport cost; many people are not being able to purchase food at a reasonable price. Hence, the food security problems in these areas can be linked to local food self sufficiency. However, the priority is on the problem of those farmers who have to improve the farm production both for self-consumption and for sale.

Recognizing the need to builds on success achieved so far to attain growth with equity, the country prepared **Agriculture Development Strategy** to replace the Agriculture Perspective Plan, a long term perspective plan providing an overall direction to ensuing development plans and aimed at the fulfillment of basic needs focusing to secure food security for all by the end of 20th year of implementation.

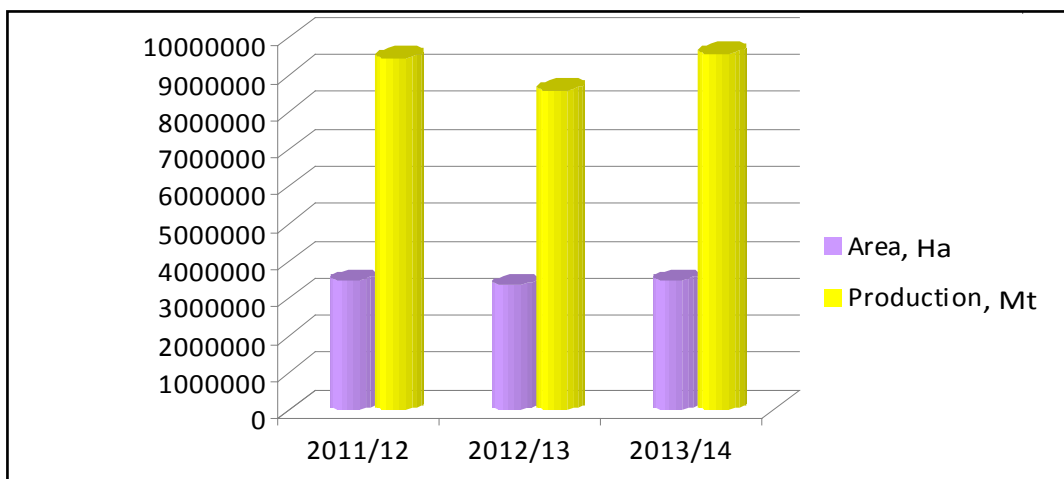


Figure 1 : Trend of area cultivation and production of major cereals from 2011/12-2013/14

Source : Krishi Diary, 2072

The area of cultivation was found quite similar for three years but the production decreased in 2012/13 as compared to 2011/12 and 2013/14. Its' may be due to bad weather condition during the production cycle. The productivity of cereals was found around 3. The production is three times higher compared to area of production (Figure 1).

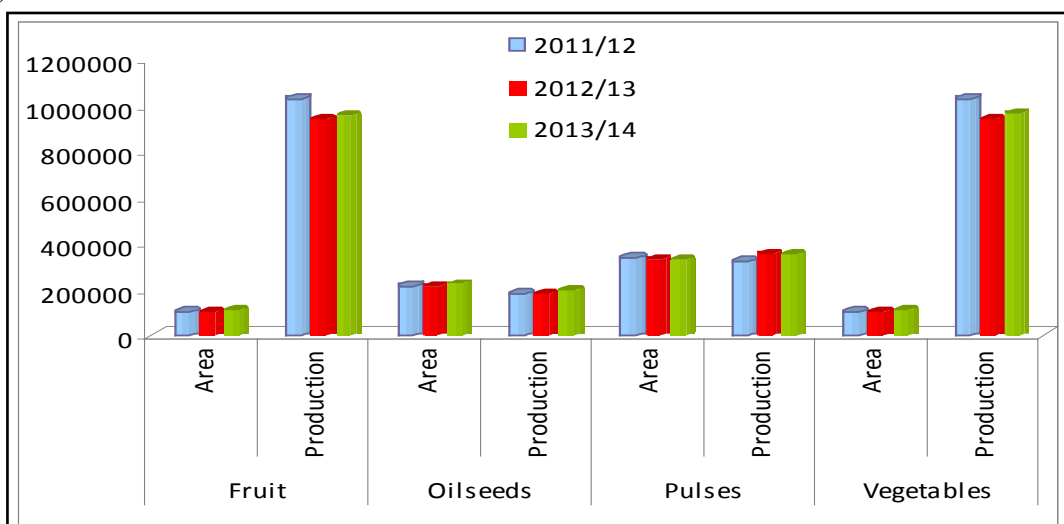


Figure 2 : Trend of area cultivation and production of different crops from 2011/12-2013/14

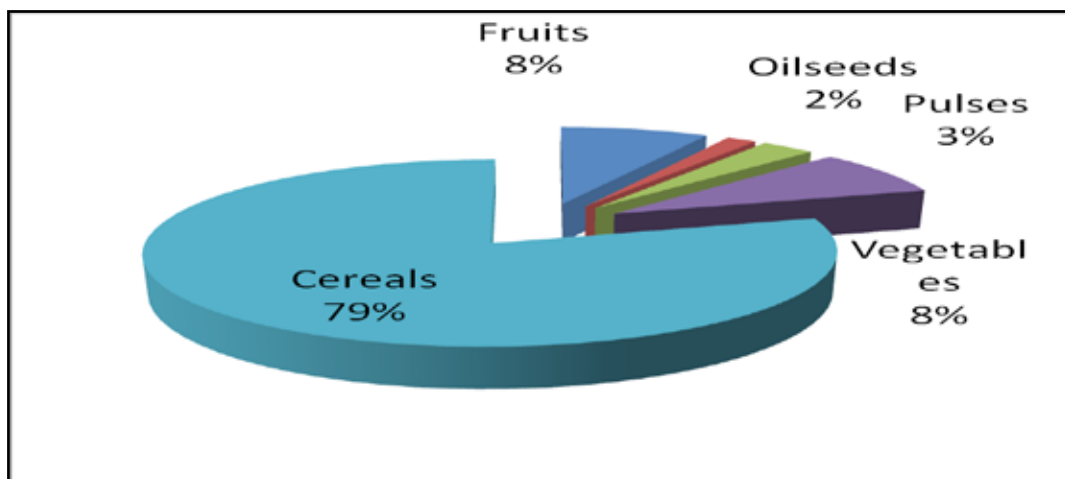


Figure 3 : Volume of production of different crops in 2013/14

The cultivation area of cereals was found higher compared to fruits, oilseeds, fruits and vegetables. The cereals followed by pulses, oilseeds, fruits and vegetables in terms of area cultivation in Nepal (Figure 2). The cultivation area of cereals is around 34,80,000 ha while the other crops has less than 3,00,000 ha. The productivity of fruit and vegetable was found around 10 but oilseeds and pulses had around 1 (Figure 2). The cereals had higher contribution in total production as compared to other groups. The contribution of cereals were found 79%, fruits and vegetables contributed 8% each, pulses contributed 3% and oilseeds contributed 2% in total production (Figure 3). The volume of production of cereals was found higher but the price per kg of fruits, vegetables, oilseeds and pulses is greater than cereals. So, the volume of production of cereal is higher as compared to others but the economic value of other is higher than cereals due to price.

Performance of the Agricultural Sector with respect to major crops

The overall annual growth rate of agricultural sector during 2071/72 is estimated at 1.9%. The production of food grains would be decreased by 3% of previous year and would be 92,66,000 mt in the next year. Similarly, the production of paddy would be decreased by 5.1% of previous year and would be 47,88,000 mt in the next year (Economic Survey, 2071/72).

The agricultural development policies were directed to increase total food production and agricultural technology policies, in turn were necessarily grain-based, and public private sector driven research approaches. Some of the major objectives of the thirteen three year interim plan are (Agriculture sector only):

- To increase the production and productivity of agricultural products
- To commercialize and make competitive agricultural produce
- To develop and extend the environmental friendly agriculture technologies to reduce the negative effects of climate change
- To protect, promote and utilize the agro biotechnology

Targets

- Individual per year food production: 389 Kg
- Individual per year pulses: 16.5 Kg
- Individual per year fruits: 34 Kg
- Individual per year vegetables: 123 Kg
- Individual per year potato: 86.6 Kg
- Individual per year fish: 2.7 Kg

Among the priorities of Agricultural Development Program is "District Plan as a Converging point between the bottom-up process e.g. identification of the local needs, constraints, opportunities and potential of the local people and the "top-down" process e.g. information of national priorities, policy guidelines will be undertaken and implemented."

1.2 Objectives

The main objective of this study is to see the cost of production trend of major cereals (paddy, maize and wheat). Besides this, the study intends:

- To analyze the trend of production cost of cereals
- To provide the gross profit trend data of cereals
- To analyze the impact of mechanization on crop production
- To analyze what will happen in the profit if the cost increased by 1%.
- To present the abstract/summary of previous completed research from this organization

1.3 Rationale

Agricultural development policies were directed to increase total food production. One of the major objectives of the thirteen three year interim plan is to increase agricultural production and productivity to meet the growing domestic food demand. During the Plan period the targets are set for to achieve the stated objectives. This report utilizes the secondary data available including impact analysis. It is therefore, in this report an attempt has been made to analyze the data on cost of production trend and net profit of major food crops via paddy, maize and wheat.

1.4 Methodology

Data is gathered mainly from secondary sources. The secondary data was entered into CSPro software developed from senior statistician Mr Dinesh Bhattra. The data was derived from Economic analysis and Statistical Division as the Division has been conducting studies on cost and production of major crops since 2029 and now the division has been changed into marketing research and statistics management program since 2061. The results were obtained by the use of Strata software. For other information the published reports and booklets are concerned. Moreover, technical committee, key informant and knowledgeable persons from the Ministry of agriculture development and Department of Agriculture are also used for collecting information on paddy, maize and wheat. The abstract of previous studies were also compiled from the books published from the market research and statistics management program from 1972/73.

1.5. Limitation

- Data gaps of few years.
- Due to lack of year wise data, we analysed only cereals and not included vegetables and commercial crops
- Due to Budget limitations, this study covers only cereals.

Chapter II

MAJOR FINDINGS

2.1 Average Production cost and gross income of major cereals, 1993/94 - 2013/14

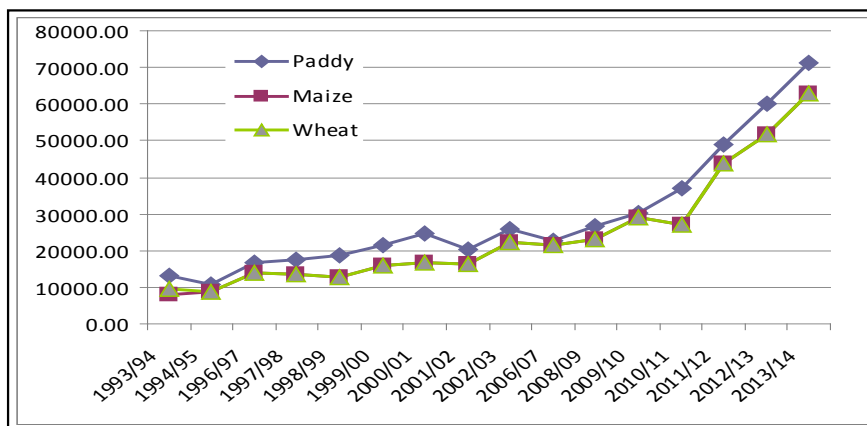


Figure 4 : Average Production Cost Trend of Major Cereals from 1993/94 to 2013/14

Agricultural production has been dominated by the cultivation of cereal crops. The trend of average cost of production of paddy, maize and wheat was increasing. The rate of increase was found slow from 1993/94 to 2000/01 and the rate of increase was found rapid after 2000/01. Average cost of production was Rs 10,000 per ha in 1993/94 and Rs 60,000 in 2013/14 which is six times greater as compared to base year 1993/94. Total cost of production was found greater in paddy as compared to wheat and maize (Figure 4).

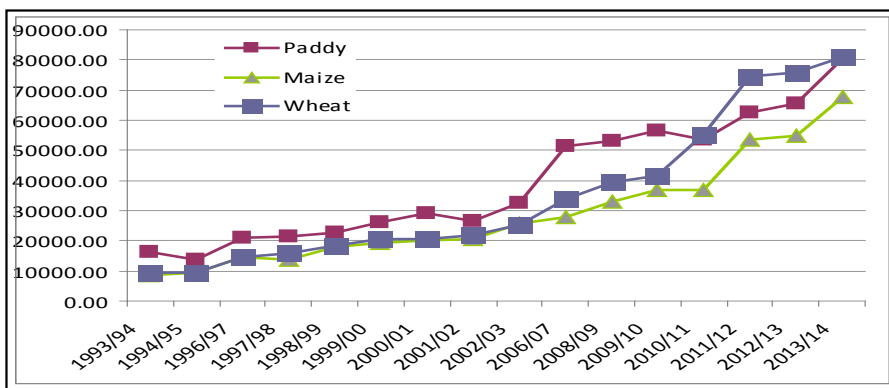


Figure 5 : Average Gross Income Trend of Major Cereals from 1993/94 to 2013/14

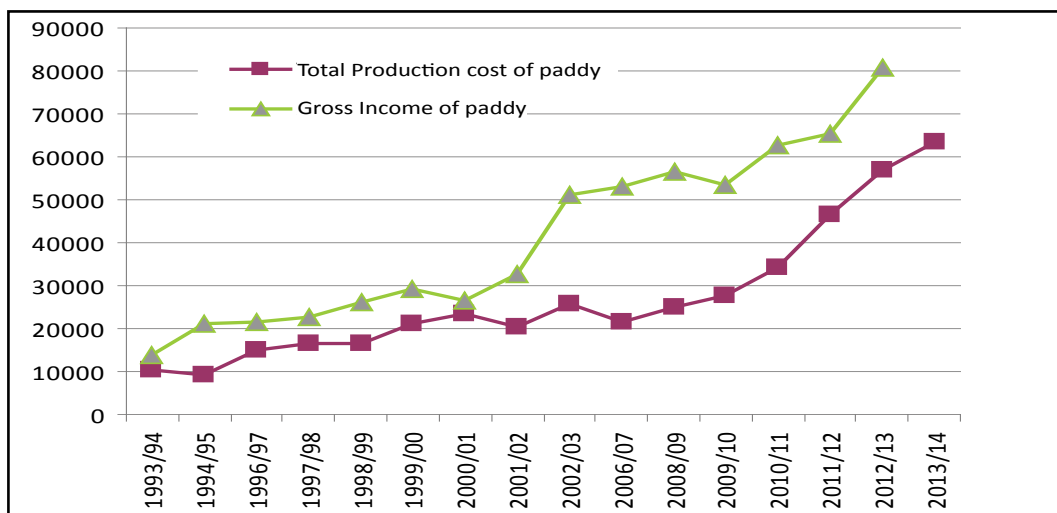


Figure 6 : Average Production Cost and Gross Income Trend of Paddy from 1993/94 to 2013/14

The trend of gross income from production of paddy, maize and wheat was found increasing. The rate of increase was found slow from 1993/94 to 2001/02 and the rate of increase was found rapid after 2001/02. Gross income from production was Rs 10,000 per ha in 1993/94 and Rs 80,000 in 2013/14 except maize (Rs 70,000) which is eight times greater as compared to base year 1993/94. Gross income was found greater in paddy and wheat as compared to maize (Figure 5). The profit is the difference between production cost and gross income from production. In case of paddy wheat and maize, the profit is around 1000 per hectare in the base year 1993/94 while it reached up to 20,000 per ha in 2013/14 (Figure 4 and 5).

The gap between total cost and the gross income is the profit gained by farmer. The gap between total cost and gross income was narrow from base year 1993/94 upto 2002/03 but the gap increase from 2002/03 upto 2012/13 and again gap became narrow. The graph showed the profit was higher from 2002/03 upto 2012/13 as compared to other years. The profit again reduced from 2012/13 to onwards (Figure 6).

2.2 Average Farmgate price of major cereals, 1993/94-2013/14

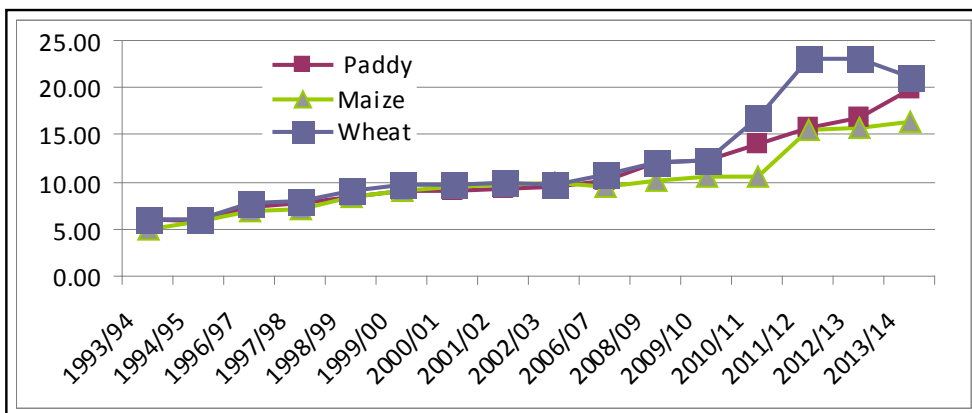


Figure 7 : Average Farmgate Price Trend of Major Cereals from 1993/94 to 2013/14

The Farmgate price of paddy, wheat and maize was found increasing from the base year 1993/94 to 2013/14. In 1993/94, the Farmgate price was Rs 5/Kg but the price is Rs 20/Kg in 2013/14. The Farmgate price of paddy was increased by 234 percent. The Farmgate price of maize was increased by 184 percent which is the lowest compared to paddy and wheat. The Farmgate price of wheat was increased by 246 percent which is the highest compared to paddy and maize (Figure 7).

2.3 Average Human labor wage, 1993/94-2013/14

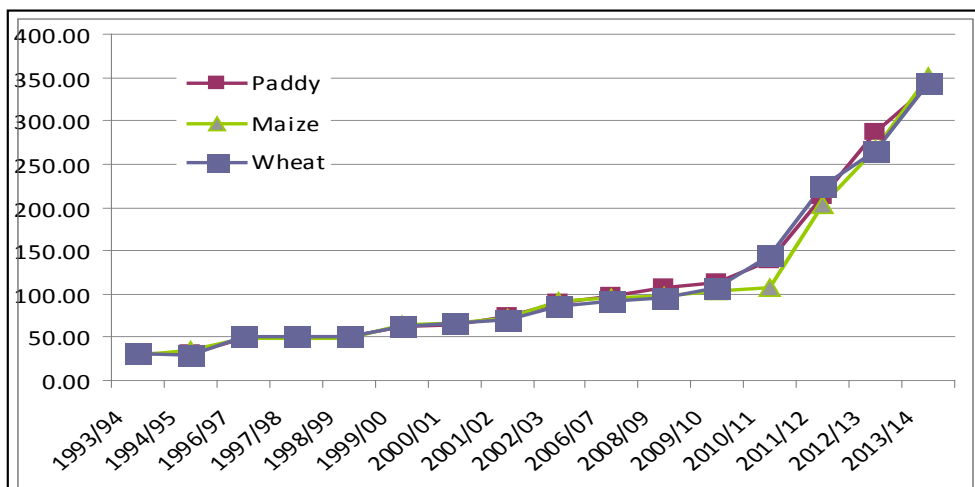


Figure 8 : Average Wage Rate Trend of Human Labor for Major Cereals from 1993/94 to 2013/14

The human labor wage rate for cereals was found increasing from the base year 1993/94 to 2013/14. In 1993/94, the human labor wage rate was Rs 30/day but the wage rate is Rs 350/day in 2013/14. The human labor wage rate for paddy was increased by 1019 percent. The Farmgate price of maize was increased by 1090 percent which is the highest compared to paddy and wheat. The human labor wage rate for wheat was increased by 1014 percent which is the lowest compared to paddy and maize (Figure 8).

The Farmgate price of cereals products and the human labor wage rate are the important factors in benefit cost ratio. We can see the increased percentage of both factors in increasing but the rate is different. The growth rate of Farmgate price of products is found by 250% while the wage of human labor growth rate is around 1000 percent. There is a huge difference between these output price and input price. The high input price growth rate means increased the cost of production while the low output price growth rate means low increase in price of output. This difference made the profit from cereals very low. So, there is a need to replace the use of human labor by mechanization which helps to reduce the cost of production and increase the profit by cereals farming. Mechanization reduces the cost of production by 40% (MRSMP, 2012).

2.4 Average Price of chemical fertilizer, 1996/97-2013/14

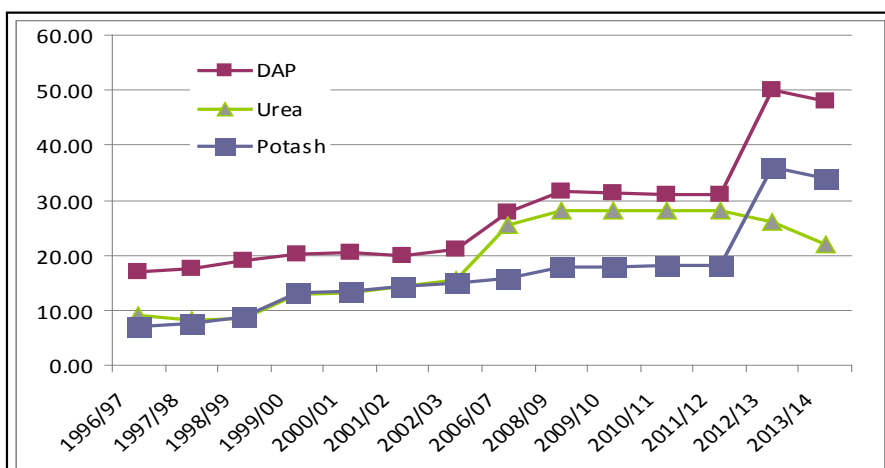


Figure 9 : Average Price Trend of Chemical Fertilizer from 1996/97 to 2013/14

The price of DAP is higher (around double) than urea and potash from the base year. The price of chemical fertilizer is also increasing from base year to onwards. The price growth rate is around 200 percent. In 1996/97, the price of DAP was Rs 18/Kg while the price is Rs. 50/Kg in 2013/14. Government of Nepal has a policy of subsidy in chemical fertilizer price. The government of Nepal has provided the transportation and price per kg subsidy also. Majority of the farmers are using double of recommended dose of urea every year. Farmers are not interested to use DAP and potash as compared to urea. The price of chemical factor has great impact on cost of production of any crops. The ministry of agriculture development has to make aware the farmers about the recommended dose, provide the sufficient quantity of fertilizer on time with best quality (fertilizer should have fixed nutrient percentage, eg, 46% nitrogen in urea). The application of chemical fertilizer is essential to take optimum production from the crop production. The overdose and under-dose application has negative impact on production. So, we should aware the farmers about recommended dose of fertilizer with on time application.

2.5 Cost of production of paddy in 2013/14

Total cost of production of paddy per hectares was Rs. 71132.3 while the gross income was found Rs. 80722.7. The gross profit at Farmgate price was found Rs 9590.4. The production cost per quintal was found Rs 1740.1. The Farmgate price of paddy was Rs 19.9 per Kg. The profit gained from cereals is quite lower than vegetables and fruits due to higher cost of production (*see appendices for details*).

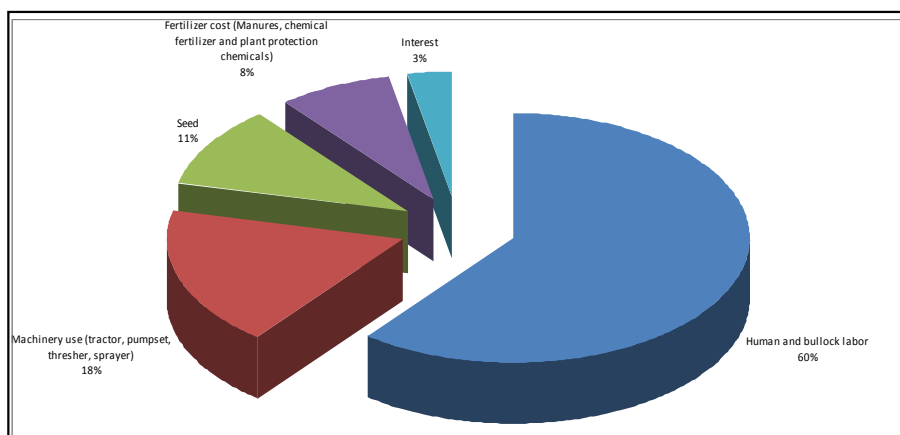


Figure 10 : Percentage contribution on total production cost per ha of paddy, 2013/14

The human and bullock labor cost has great important in cost of production. The human and bullock labor cost has 60% weightage in total cost of production, followed by machinery use (18%), Seed (11%), fertilizer cost (8%) and interest on capital (3%) (Figure 10). Sixty percent costs have to spend on human and bullock labor for the production of paddy in 1 ha. Therefore, the policy maker has to think to reduce and replace the human and bullock labor by machinery use to get more profit from cereals farming in future. The cost will be reduced by 40% if human labor is replaced by machinery (MRSMP, 2012). So, the policy maker should develop policy for the replacement of human labor in production process.

2.6 Average cost per quintal of Major cereals

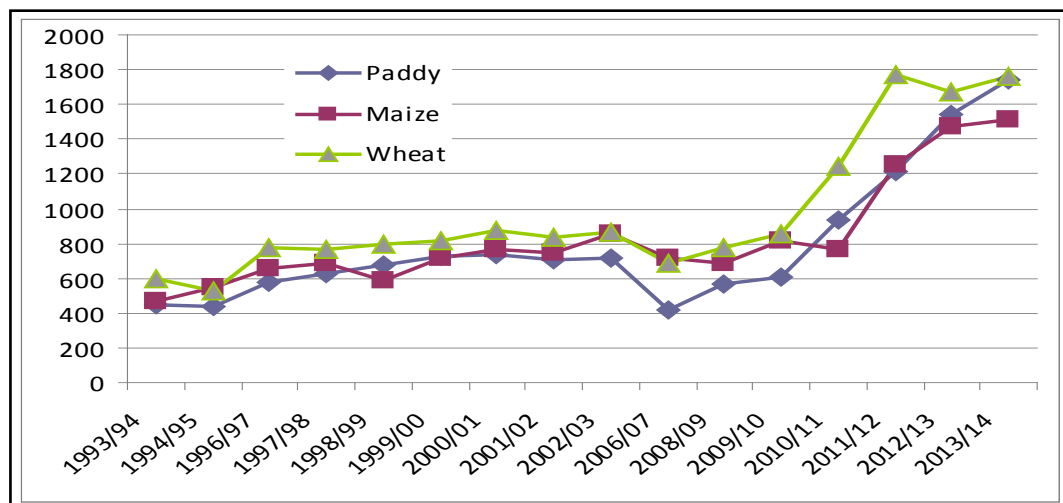


Figure 11 : Average Cost per quintal o major cereals, 1993/94-2013/14

Average cost per quintal of major cereals was also found increasing. The trend was found increasing at higher rate from 2006/07. In 1993/94, average cost per quintal of paddy was found Rs 445 but it is Rs. 1740 in 2013/14 (Figure 11).

Chapter III

SUMMARY, CONCLUSION AND RECOMMENDARION

3.1 Summary

The trend of cost of production, gross income, Farmgate, chemical fertilizer, human labor wage rate was analyzed by the use of Strata software. This report focuses on the trend analysis of paddy, maize and wheat only. Cost of production trend was found increasing from the base year 1993/94. The rate of increment from 1993/94 is quite low but the rate is higher from 2009/10. Total cost of production was found Rs. 10,000 per ha in base year and it reached upto Rs. 25,000 per ha upto 2009/10 but it reached upto Rs. 60,000 per ha in 2013/14. The total cost of production is increased by 500% from 1993/93 to 2013/14.

The trend of gross income is also similar to total cost of production of major cereals. The gross income was found Rs. 12,000 per ha but it reached upto Rs. 80,000 per ha. The net profit was found Rs 2000 per ha in 1993/94 but it was found Rs 20,000 per ha in 2013/14. The net profit from maize was found lower compared to paddy and wheat from base year to 2013/14. The reason behind this is human labor and the wage rate.

The difference between total cost and the gross income is called profit. The profit from cereals farming was lower from base year to 2000. The range of profit increased from 2000 to 2010. Again, the range of profit gaining from cereals farming is decreasing compared to 2000 to 2010 period.

The Farmgate price of major cereals was Rs 5/Kg in the base year and Rs 20/Kg in 2013/14. The Farmgate price of major cereals is increased by 250%.

The human labor wage rate was Rs 30 per day in the base year and Rs 350 per day in 2013/14. The human labor wage rate is increased by 1000%.

National average cost of production of paddy was found Rs. 71,132 per ha in 2013/14.

The gross income was found Rs. 80,722 per ha. Production cost per quintal of paddy was found Rs. 1571. The net profit from paddy farming was found Rs. 15, 985 per ha.

About 60% of the cost should spend on human and bullock labor for the production of paddy in 1 ha followed by the machinery use, seed, fertilizer cost and interest on capital.

3.2 Conclusion

A farmer should spend 60% on labor cost for the production of paddy in 1 ha, followed by machinery use, seed, fertilizer and interest on capital. The human wage labor is increased by 1000% in 20 years period but the Farmgate price increased only by 250%. The policy makers should change the strategy to replace the human labor by tractor and other mechanized tools from cultivation to harvesting and threshing to get higher net profit from cereals farming. The productivity of cereals in Nepal is lower as compared to other South Asian countries. Therefore, we should focus on research to develop high yielding varieties and replace the low yielding varieties that helps the farmer to get more profit from cereals farming. The b/c ratio of cereals is just 1-1.5 while vegetables and fruits have 1-3 and 1-5 respectively (MRSMP, 2015). The profit gained from cereals is lower as compared to vegetables and fruits.

The ministry has to develop policy to replace human labor by machinery for cultivation, harvesting and threshing which helps to reduce the cost. At the same time, the ministry should focus research to develop high yielding varieties and aware the farmer to replace the local low yielding varieties by high yielding varieties. The high yielding varieties should be available in sufficient quantity and quality. This will helps to gain more gross income from cereals farming. Finally, high gross income and low cost of production gives high b/c ratio and high net profit from cereals farming in future. This will help to attract the youth in agriculture sector in future.

3.3 Recommendation

The human and bullock labor are the key factors for production of cereals. Sixty percent of the total cost spent on human and bullock labor for the production of paddy in 1 ha. The wage for human labor is increased by 1000% in 20 years period.

This situation reduces the profit gained from cereal farming and the farmers are not interested to be engaged in agriculture sector. Therefore, the ministry of agriculture development should change the policy for the production of cereals, the human and bullock labor should replace by mechanization like tractor for ploughing, rice planter for planting, weeding by machines, harvesting and threshing also should be done by thresher and harvester. The application of machines reduced the cost by 40% and increased the profit from cereal farming.

The ministry of agriculture development should increase the investment on research of high yielding varieties and extension services including new technology for the increment of gross income from cereals. The government institutions should make the sufficient availability of improved seeds in a reasonable price.

The ministry should focus on the extension of extension services in the grassroots level. The improved technology should reach at the hand of farmers for the best execution.

This study collects the production cost data of 20 years. This process will help to prepare the data bank on production cost which help to forecast for future planning.

The ministry of agriculture development started the schemes of crop insurance. The crop insurance schemes was not so effective to reach the farmers level. The loss incurred during crop production process would be reimbursed on the basis of cost of production. Therefore, for the effective implementation of crop insurance schemes, the cost of production should represent all the cost for the four factors of production namely, land, labor, capital and management. The missing component management cost should be included in cost calculation. Calculation of total cost including four factors of production will help the farmers for the accurate reimbursement of loss from insurance schemes.

Finally, the government focuses on youth involvement on agriculture sector, increase the employment opportunities in agriculture and increase the GDP contribution by agriculture sector in national economy. For the achievement of the above mentioned objectives, cost of production calculation, importance of each and every component of factors of production, the availability of this report including analysis from every corner would be a very important asset in future.

COLLECTION OF SUMMERY AND CONCLUSION

from previous studies

1. DEVELOPMENT OF AGRICULTURAL EXTENSION SERVICES IN NEPAL, 1972

The development of extension in Nepal can be divided into three broad phases. The first phase (1952-58) characterizes the initial stage of the country's agricultural development which embraced extension and village development as its two main components.

The main objective of the village development programme was to raise agricultural production by bringing about improvements in the age-old agricultural methods and practices and to improve the economic condition of the realities. The V.D. programme was to act as a two-way channel between the Government and the people-carrying information to the people and bringing their problem back to the Government. Training Centers were opened to train medium-level technicians, Village Development workers, who were to work with people in the villages.

The First plan was put into effect in 1956. The plan proceeded to run the V.D. programme by dividing it into three categories namely, the local development programme, the Doha Development programme and the V.D. programme. The V.D. programme was to be operative at the highest level. It covered all major community development activities like modern farming, soil testing, health, education, cottage industries, marketing, cooperatives and extension. Fund allocations were made for successful implementation of the V.D. programme.

Many of the programmes envisioned in the V.D. programme and the first plan were not fully accomplished. Two of the main reasons for this were people's poor response to the developmental efforts and lack of necessary infrastructures. However, they led to the establishment of a foundation upon which the future programmes could be based.

The department of Agriculture carried modern farm knowledge to the farmers through such media as demonstrations, agricultural farms, cooperative, V.D. programmes, pamphlets and booklets and V.D.W.'s stationed in the development block. The block

Development officer supervised the work of the field personnel's in their village development and extension efforts.

The second phase (1959-65) started in August, 1959, when extension was separated from the V.D. programmed and was established under the department of agriculture as the agricultural Extension section on the former. The former V.D.W.'s were given additional trainings and converted into junior Technical Assistants.

The Agricultural Extension Section started extension work in as many districts as possible, given the technical and financial limitations at hand. By 1963, the Section had opened zonal offices in a total of 11 zones.

The Land Reform programmed, a further step towards augmenting the agricultural development programmed, was started in 1963. This demanded a remodeling of the extension machinery, and started extension into the third phase (1966-70) of its development in Nepal.

To achieve the objectives of the Land Reform programmed, it was felt necessary to coordinate the workings of different departments and agencies which were engaged in pursuing the same goal of rapid agricultural development and rural reconstruction. This accounted for the launching of the coordinate agricultural development programmed in 1965. This programmed was an effort to reach the goal of a fifteen percent increase in food grains and to increase the level of production of cash crops, vegetables, fish and poultry as stipulated in the Third plan. District Agricultural Development offices were opened in each of the coordinative districts with a district agricultural development officer (DADO) as the chief coordination person. JT's and JTA's assisted the DADO in technical matters. Coordination committees were formed at the central as well as the district levels. The central coordination committee (DCC) made development policies at the central level and provided guidance and direction to the district Coordination committee (DCC). The DCC formulated and carried out the agricultural development programmed of the district.

In August, 1966, the department of agriculture was reorganized into five separate

departments. They were: Department of agricultural Education and Research, Department of agricultural Extension, department of Horticulture, Department of Lives took Improvement and Veterinary and Department Fisheries. Under the third plan, which was put into effect in 1965, various programmers were contemplated as the means to fulfill the targeted growth in agriculture. The extension of new dimensions in the overall fields year by year. The number of districts brought under the extension programmed also went on increasing every year.

In 1970 the extension programmed was being carried out fewer than three major heads, namely development of food grains, development in fruits and vegetables, and development of lives took, poultry and fisheries. Many different extension methods were being employed to achieve the targets of the various programmers.

The organization of the department of agricultural Extension at the end of 1970 was comprised of the agricultural Information Section, the rural youth section, Karnali zone agricultural development project and agricultural supply corporation as an affiliated agency.

2. A FEASIBILITY STUDY ON GROWING SUPERFINE RICE, 1974

The cultivation of superfine varieties of paddy as observed in the district of Rupandehi is drastically decline. Relatively big farmers grow this crop mainly for their own consumption. Sizeable quantities of these varieties supplied to the market would suggest that some of these farmers who have not largely gone for the non conventional technology still grow them. However, with the market determined prevailing price ratio for different varieties the reduction of area under these varieties may continue, unless some technical improvement of these varieties bring about changed profitability in crop combinations.

The economic feasibility of growing these varieties for export as analyzed shows high sensitivity to the technical feasibility of growing a very high quality fine grain rice on Nepalese soils and under Nepalese environment. Unless high quality can be assured this project may be marginal or even a submarginal one.

3. EFFECTIVENESS AND PERFORMANCE SURVEY REPORT OF KABRE AGRICULTURE FARM, 1987

Major findings and Recommendations

Crop research and development

KAF is fairly successful in crop research and development activities. It has already verified and recommended pekhareli masino rice, and two others (NR-10068 and 10076) are very popular with local farmers. The podhareli masino variety has occupied about 41% of the lowland during the summers: prior to that all were local varieties. About 43% of the wheat growing area is now covered by improved wheat (RR-21). Similarly, improved maize (Kakani yellow, Rampur yellow, and Rampur composite) is grown on 64% and 100% of uplands and lowlands, respectively, whereas local varieties were grown in all lands before the establishment of KAF. Several varieties of potato, Lentil, soybean, barley and finger millet are showing good performance under farmer's condition.

The average yield of major cereal crops has increased (0.5 to 1.0mt\ha) since the establishment of KAF. However, yields are still far less than they could be.

Seed production

KAF has been meeting its seed production targets, except in wheat for the year 2042\43 due to severe drought. It seems that targets do not coincide with farmer's demand for seed (farmers are demanding more improved seeds but KAF has same seed production target each year).

If KAF does not own enough land to increase seed production sufficiently, perhaps it can multiply seeds in farmer's field by motivating them.

Training

Due to the cancellation of farmer's trainings by department of agriculture, the training facilities of KAF are now limited to only the "Refresher Training" of JT\JTAS. It is important to restart farmer training because the training facilities of DADO Dolakha

& IHDP are extremely inadequate.

Outreach

Only 6% of the FH have met KAF staffs at their nard or villages. About the outreach program of KAF, and 39% have participated in FFTS and FFDS. Tense outreach activities are also flexile according to the change in posting of the farm manager (s). Some manager visit the villages frequently to receive farmer's feedback, but some do not visit villages the uneasy when the\talk with farmers. Farmers expressed the need for field oriented staff and smooth outreach activities of KAF. Thus, the performance of the farm staff should also be evaluated on the delis of farmer's response.

Services

Twenty-eight percent of the FH have received services from KAF only when they go to KAF to ask help. Of the total recipient of services, 22% are Satisfied with the present status of services and 78% are dissatisfied and have suggested that seed and other services be provide on time to make the service program more effective.

Farm facilities

Because KAF lacks enough facilities (irrigation, laboratories, etc) and generally faces the problem of late arrival of budgets and under-staffing, the concerned authorities suggested the following solutions:

Irrigation

Within the farm there is a source of water which flows 6 liters\minute during the dry season. It is proposed to make two reservoirs linked with a collection chamber. This can make the farm irrigation less problematic during the dry season.

Maintenance (repair) works:

- a. irrigation canals
- b. storage buildings
- c. office buildings
- d. staff quarters

- e. threshing floor
- f. equipment (repairable) in the store

Additional structures needed in the farm

- a. seed processing plant
- b. laboratories (soil and seed)
- c. staff quarters (farm manager's and other staff)
- d. storage
- e. dormitory (for trainings and accommodation of trainees)
- f. wireless station
- g. link road (4 Km from LJRP and vehicles)
- h. shade (beside the threshing floor)

Man power

The staff members stationed in Jiri should be sent to the farm and the farm needs the following additional staff:

- a. Seed technologist – 1, G, class – 3
- b. Soil scientist – 1, G, class – 3
- c. JT – 1, NG, class – 1
- d. JTA – 2, NG, class – 2
- e. FA – 1, NG, class – 3
- f. Watchmen of workers – 7
- g. Accountant -, NG, class – 1

Autonomy

The farm should be given autonomy in handling its budget and administration.

Equipment

The farm needs agricultural equipment such as thresher, power tiller, generator, etc.

Meteorology

This station in the farm needs to be supplied with an evaporimetre.

4. ECONOMIC ASPECTS OF FRUIT AND VEGETABLE PRODUCTION, 1992

This study was designed with the objectives of measuring employment and income level of selected fruit and vegetable farms in the hills and tarai districts of Nepal. Data were gathered using structured questionnaire. The study area comprised of Illam, Dhankuta, Jhapa, Dhanusha, Sarlahi, Bara, Makwanput, Chitwan, Kavre, Rasuwa and Dhading districts. Purposive sampling was used in selecting the farm households. Fruits and vegetables under study included apple banana, pineapple, bitter gourd, lady's finger (Okra), Cauliflower, potato, tomato, peas, radish, Pole bean, baronial and onion.

The cost of production of apple on Rasuwa district was estimated to be Rs. 2.74/Kg. Similarly, cost of pineapple production in Dhading, Chitwan and Jhapa ranged between Rs. 1.38 to Rs. 1.49/Kg. The cost of banana production was about Rs. 1.60/Kg in Dhading and Chitwan districts.

The benefit cost ratio of these fruits varied between 1.86 to 3.66 showing their relatively higher level of profitability in terms of investment. In the fresh vegetable production, the cost of radish production was found to be the lowest (Rs. 0.56/Kg) in Makwanpur district. The cost of production of other crops such as cauliflower, potato, brinjal, bitter gourd etc ranged between Rs. 0.56 to Rs. 2.42 per Kg. The benefit cost ratio varied between 1.65 to 4.09. The highest ratio was found in cauliflower production the Bara and the lowest in potato in production in Kavre.

The employment opportunities generated by fruits particularly banana and pineapple were found to be lower compared to cereal crops. The vegetables sub-sector employed higher labour which ranged between 276 days to 926 days per hectare whereas cereal crops required 185 days to 231 days. This accounted for a requirement of labour by more than 170 percent in vegetable production against cereals. Therefore, vegetable production was found to be one of the best agro-enterprises which utilized the farm level unskilled labour.

In terms of net profit both vegetables were found superior over the cereal crops. For instance net profit (return-cost) from pineapple was estimated at more than Rs. 57100 per hectare compared to Rs. 14700 for cereal crops in Jhapa district. Similarly, in the districts surveyed, the per hectare average net profit from vegetable production ranged between Rs. 20502 to 43117.

To sum-up fruit and vegetable production in surveyed areas of the districts were found to be highly profitable crops compared to cereal crops. In terms of employment and income vegetable production was more preferable as employment of labour was more intensive indicating that these enterprises likely to remain unemployed. The limiting factors for growing vegetables in a small scale are mainly physical suitability of soils and material constraints such as fertilizer and cash including risks associated and inadequate marketing facilities such as fertilizer and cash including risks associated and inadequate marketing facilities.

5. SOCIO-ECONOMIC STUDY OF THE JANAKAPUR ZONE, Volume III (Sindhuli District)

Executive Summary

Agriculture is by far the most important sector of Nepalese economy because about 94 Percent of the Population is dependent on agriculture. It is fact that in recent Years agricultural Programmers have received top most Priority in Nepal's development Plans, Agriculture is important sector in the developing countries for its major share in national product. The scrotal saving is used to incest even in non-agricultural sector and it has been understood that agriculture is the main sector to provide finance in the initial phase of development. In this case it has been observed that the major percentage of government revenue also comes from land and export duties on agricultural commodities.

But Nepalese farmers have to face series of problems e. g. small size of plots of cultivated land lack of irrigational facility, uncertainty of monsoon, low income traditional marketing system, low productivity and inadequate know how.

The present study was designed to investigate, how the Nepalese farmers are leading their social life. Are farmers aware of the improved agricultural technique and methods?

Keeping these points in view the report has been presented with the following headlines.

- 1) Social aspect.
- 2) Economic aspect.
- 3) Technological aspect.

In social aspect, caste, health, education, family system, marketing Transportation, drinking water and housing have been considered as the determining factors of the welfare of farm family. The general survey findings show that of 57 sample farm family of Sindhuli District, 85.96 percent farm have depended on agriculture as a

main occupation and 39.22 percent farm family are engaged in agriculture farming as side occupation.

As regards education the literates are less in number. Majority of children and female members are illiterate who have been found involved in an agricultural activities, out of 57 farm families surveyed 54.40 percent illiterate and 38.60 percent literate are found. About 7 percent family members are educated up to S. L. C. and above S. L. C.

Joint family system was found prevalent in the district size of family member being directly related with the size of holding. Family size was found big in family owing holdings small with small holding.

The farm families of Jhangajholi and Kurtholi Panchayat do not have yucca road so mostly farm family have been using, hours, mules and porters for transporting.

The living standard of the Peasants was found to be lower especially in the smaller size group. Peasants have maintained very low living. They have got small cottages and there is no provision of drinking water.

Irrigation facilities agricultural production, income from livestock and loan has been taken as the percentage to increase economic well being of the farm families.

The facilities of irrigation is not available in Sindhuli district so. Agricultural production is not high. Farm family income from cereal and cash crops and livestock, is not quite enough to meet their requirements. Above 50.00 percent of farm family were found suffer from loan. Small famers were found taking loans for footing clothing's and other purpose.

Technological aspect can be gain through the use of improved seeds chemical fertilizer insecticide, pesticide and improved equipment.

The Present study covers both panchayats under extension and non extension. In Extension panchayat the technical service for improved technique is given by agricultural development office whereas in non extension panchayat, no institutional

facilities are available to the farmer.

The report attempts to show the impact of agricultural technology in the farming practices. The problem in the district was the inadequate supply of modern as well as the lack of active extension agents.

In extension panchayat out of 230 households selected only 33.33 percent family have adopted improved technique of agricultural and 66.67 percent of farm families were not following improved technology. In non-extension panchayat out of 27 households, only 14.81 percent farm families found following improved technique.

Most farm families were not following improved technique, on account of imperfect knowledge, lack of sufficient money and inadequate water supply. All these reasons were equally hindering the adoption of improved methods in farming.

It is fact that extension areas are in general enjoying more facilities than the non-extension areas.

6. AGRICULTURAL EMPLOYMENT AND INCOME (A case study of Morang district), 1994

Objectives

The main objective of the study is to assess the agricultural employment and income situation in Morang District.

Following are the specific objectives of the study :

- To find out the average family size, holdings according to classification of land size, and distribution of labor as per occupation and holdings.
- To find out labor use pattern in agriculture.
- To find out average area and production of some major crops per farm household.
- To find out the labor supply in agriculture.
- To find out farm and non-farm income.
- To identify the constraints and prospects of employment and to suggest for improvement of agricultural employment and income situation.

Recommendation

On the basis of analysis of survey data the following recommendations are presented hereunder.

There exists an underemployment problem in the study area. There are series of causes of underemployment which has already been mentioned above. Labor is cheap in rural area as compared to urban area. The bargaining power is poor owing to lack of alternatives. Finally, the income of small farmers is low. The lack of sectoral mobility is one of the features of employment structure in Nepal. Majority of the population are still confined in agriculture and the occupational distribution pattern has remained.

In order to make the national objectives "alleviation of rural poverty" Lively the

following steps should be immediately undertaken.

Majority of farmers are involved in cereal crops cultivation and productivity remained more or less the same since a long time. The lesson behind this entails server realities viz, traditional farming system, cheap labor costs, lack of knowledge about alternative farming and lack of inputs in time etc. If modern technologies, input, and effective extension services are provided for the farmers effectively it will certainly help enhancing the farm income.

Crop diversification is another important solution to improve rural income as well as employment condition. For example vegetables are high valued cash crops. Jute is widely grown in the area having commercial value. Farmers should be initiated to cultivate such crops. For this, they should be provided necessary technical as well as financial assistance. The minimum support price should be satisfactory for them so that their concentration should be continued. Similarly, vegetables are proved high returning crop in short period. Therefore, farmers should be encouraged to cultivate vegetables suitable to climate in the area. The crop diversification activity will fortify both employment and income situation in rural areas.

Despites certain amounts of products are left to sell in the markets, the marketing problem is another constraint responsible for low income. Local Haat Bazars are the only place where they sell their products. In some places, the markets are far away from the production areas. Therefore, local markets should be developed. Again, small volume of marketable surplus is another problem. To cope with this problem, group farmers approach is very appropriate. Therefore, the farmers should be taught the importance of group approach and initiate them to form group.

Small farmers are engaged mostly in non-farm activities. In order to provide employment opportunity and generate more income, non-farm activities like processing units of tomato, fruits and vegetables, etc. should be established. Similarly, activities like "Doko" and "Tokari" weaving from local resources should be emphasized. It will reinforce the employment opportunity and income generation.

7. PRODUCTION TREND OF MAJOR CEREAL CROPS IN NEPAL, 1995/96

Executive summary

On the basis of the analysis of the previous chapters, It can be summarized that (a) the increase in total production of paddy, maize and wheat is mainly due to the increase in area under cultivation. (b) The compound growth rate of yield of paddy, Maize, and wheat are 1.6, 2.3 and 1.7 percent which is low than the targeted growth years is (a) due to the increase in price of the produce rather than increasing the encouraging the production remunerative reward for the farm workers too. According to secondary information derived there is potentiality to raise the existing yield rate. However, the major impediments to realizing the potential yield rate from existing technology are: (a) Very low levels of nutrient application. (b) Scarcity of quality improved seed. (c) Lack of proper management of water for irrigation. (d) Lack of functional Coordination between research and extension.

The impediments those mentioned above have two dimensions. One related to the type of farming and the other related to the level and quality of government services. Farming system related problems operate regardless of the services offered by the public sectors and their removal requires structural of long-term measures. This category of constraints can Hill districts. In both the cases yield stability is of prime important than yield level. In both ecological regions the problem of the resource poor farmer of subsistence farmer depends mainly on monsoon. His cropping pattern is food grain-based. Since, he has meager cash earning, he produce crops with very little fertilizer or without it.

The constrains outside the farming or the government related impediments those have a major bearing on crop yields are in the provision of chemical fertilizer, improved seed, irrigation and its management, production credit technology generation and dissemination. Most of the farming areas in Nepal do not have accessibility to these inputs, credit and markets. All these also have to import have grains year in and year out shortfall of food grain requirement. However, in the distribution scheme also there

is misdistribution between regions, between districts between socio economic groups even at times of good crop harvest in Nepal.

The provision of adequate food for all the Nepalese was a major policy objective of the national economic development plans in the past. However, despite a seven times increase in fertilizer use, irrigation area expansion to 943 thousand times and public investment in agriculture by several folds, as compared to 1970 the production of major food groups has increased by only 1.4 percent per annum due to the marginal land for cultivation among other factors.

Recommendations

In remote hill dependency on improved seed and fertilizer on public or government is barrier. In this respect, mobilization of local private dealers should be encouraged. The seems more sustainable than direct government intervention. It should play a catalyst encouraging private initiative, motivating local people to organize themselves and providing technical assistance wherever necessary.

The role of extension agents would serve in providing information to the grass root level and passing feedback to the research and other agricultural support services. It is recommended that extension aimed at small farmers and hill farmers take into account the nature of their farming system. And it is required that functional coordination in research and extension should be maintained.

The district level agricultural plans should not be only target oriented but should reflect the potentialities and priority needs of the local people.

The research system also is called for to redesign its strategies so that income and employment opportunities would be enhanced through increased yields. International (consortium) research into rice and wheat systems should be strengthened. The consortium method of collaborative Research should be developed and strengthened. Similarly, maize program needs increased collaboration and coordination with both national and international agricultural agencies in maze breeding. In the national sector it should make strong collaboration and coordination with hill agricultural research

stations like Pakhribas, Lumle, Kavre, Khumaltar and Surkhet to develop and improve suitable varieties for changing need and possibilities of the agro-ecological regions. Furthermore commitment to the development of technology should be strengthened.

Monitoring is a process of project management for project implementation. It helps identify the needs and ensure whether the resources allotted for the project have been utilized to the intended extent or not. It further requires to explore the bottleneck of the project and its timely rectification. For example, the HMGN should enhance its capacity to monitor the marketing system in order to discourage collusion, hoarding and price fixing and thus protect the interest of the farming community and general public where monitoring detects such practices. AIC and local authorities should seek to increase competition.

8. SOCIO-ECONOMIC STUDY OF WOMEN IN VEGETABLE SEED PRODUCTION AND MARKETING, 1997/98

Objectives

The main objective of this study is to assess the socio-economic condition of the women farmers in the vegetable seed farming.

This study intends,

- (i) To assess women's participation and decision making in vegetable seed farming.
- (ii) To examine women's accessibility towards resources and their distribution.
- (iii) To see the profitability of vegetable seed farming.
- (iv) To study women's access to income from vegetable seed farming.

Conclusion and Recommendation

The development of seed industry in an agricultural county like Nepal is very important. High quality seed is the most critical upon which all other inputs depend for full effectiveness.

The finding of the study reveals that a higher percentage of women as compared to men are working in vegetable seed farming. It provides the employment for about a month. Women in the studied districts expressed that vegetable seed production brings 2 to 5 time more profit as compared to cereal crops. It offers an opportunity for high income per hectare. However, the percentage of women's access to resources and technology is very low. The problems related with production are unavailability of foundation seed in required quantity, unavailability of fertilizer in time, lack of regular field inspection and training etc. On the marketing side, there is no stable institutions and stable mediator. Seed Act is not yet implemented.

The success of vegetable seed growing depends largely on the availability and quality of seeds. Seed industry comprises of many complex interrelated operations needed to

ensure continuous supply of high quality seeds of vegetables. At present, the vegetable seed farming is still in infancy stage. Cultivation of vegetable seed crops usually requires more detailed attention than field crops and their culture is often specialized. For vegetable seed production more attention on skill, knowledge and specialization is commonly required.

For sustainable seed production and marketing the strategies are to increase the supply of foundation seed, and the private entrepreneurs for producing foundation seed should be encouraged the Agricultural Prospective Plan for high value crops is a private sector strategy. In this respect, government should provide support services eg. Feeder roads, training of quality seed production etc. The most, important function of policy for high value crops is to encourage and facilitate private sector investment in processing and marketing systems. For collecting the seed government policy should be directed to build a store house for vegetable seed collection in Baglung. Before available technologies can be transferred to farm women, however, they need to be trained entrepreneur and operational skills. Micro credit programmers for women vegetable seed growers should actively run. For training programmed on awareness and procedures for women should be organized for maintaining quality of vegetable seeds and private seed inspection license should be introduced. The implementation of seed act is urgently felt as necessary. Training policy must identify the specific training needs of different categories of women. Training to seed vendors should be undertaken. Attention needs to be devoted for raising grades and standards through research and monitoring. The activities of District Agricultural Development offices should focus on vegetable seed demonstration and field inspection. Proper and coordinated link among the District Agricultural Development office Koshi Hills Seed and Vegetable Project (KOSEVEG) and Lumle Agriculture Research Center (LARC) should be established in Baglung district, similarly, a coordinated link in District Agricultural Development Office NARC and Agricultural Inputs Corporation continued. Among these organizations the activities should not be overlapped.

9. EFFECT OF DOA/AGRICULTURE DEVELOPMENT PROGRAM ON PRODUCTION AND PRODUCTIVITY IN SINDHUPALCHOK DISTRICT, 2001

Executive summary

APP aims for broader participation across major geographic regions, priority groups and gender issues. APP vision has been translated into pocket package program of district agriculture program. The performance level of those pocket package program has been reported to be lacking in many respects particularly coordination among line agencies, irrigation and availability of inputs and others. Spread over effect of pocket package program in the entire area of the district in 20 years of APP implementation could cover merely around 6% of the cropped area of the kingdom.

Farmers Group (FG) approach has been on official extension approach of DADO since 1988/89. Feedback among FG, ASCs and research must be horizontally & vertically inter-linked. Farmers need assessment should be reflected in DADO/ASC. Annual program and more importantly bottom-up planning should start from FGs. Since the adoption of farmer's group approach of agriculture extension, number of farmers group exceeded 500 in Sindhupalchok district, the present survey finding shows that number is limited to 81 in the year 2001/02. DADO identified 15 farmers group to develop as a model group in the current year. Sindhupalchok district is potential cereal production but DADO do not have pocket program on cereal production.

The findings from the discussions with extension personnel and PRA with farmer's group members reveal that the program activities used to be implemented to meet the set target of DADO annual program with an less attention on inherent target of technology dissemination with an effect on production and productivity. The triangular inter relationship among research; extension and target group farmers seem to be weak.

Since the initiation of APP and implementation of pocket package program in the district level program in the years of current ninth plan, there has been no continuity. The hector coverage of pocket package program do not confirm the hector coverage

of previous year. The number of farmers group and the hector coverage under pocket package program do not tally with one tear. Every year the program targets are set as if they start from zero level. The availability and the application of chemical fertilizers have been at the minimum level in the district.

The general observation of the study was that the pocket areas have far better production and productivity than the non pocket areas. The average production of almost all the crops except paddy was much higher in the pocket area. Similarly, for the productivity as well as the production were much ahead than the non pocket area. Apart the productivity of paddy, the productivity of all other crops was higher in the pocket area than the non pocket area.

The use of fertilizer has also been high in the pocket areas than the non pocket areas in almost all the crops. For all the crops, manure was used in a very high quantity than other chemical fertilizers. Even in the use of manure it was that the pocket area was much higher than the non pocket areas for almost all the crops.

One of the major discontents that were identified during the process was that every organization and the government offices have formed a group in the village. This indicated a lot of duplication of service and confusion among the villagers. Though the area, the farmers and the land was the same. Same farmers were involved in different groups initiated by various department e. g. DADO – farmers group, MLD – women's group, irrigation department – water user's group, and other groups by different, (NGPs). This shows lack of coordination between the different government departments and NGOs. The INGO/NGO participation in these areas seem to be very high. Their contribution has mainly been in the social mobilization. The proper coordination of the activities of the NGOs could be very effective. It was seen that there has been a lot of duplication of among the various agents. This could be avoided if there is proper coordination among the government and the NGOs. The resources of both the agencies could be utilized in an effective way.

The present study was carried out in pocket and non pocket areas of Sindhupalchowk district. The main objective of the study was to assess the effect of the pocket package

program in the production and productivity. There for the approach followed was the comparative study of pocket and non pocket area on different aspects of agriculture.

Based on the present study, recommendations are made to improve the agriculture production of the given area. Farmer's groups were found to be very active in some of the areas but in some areas it was quit nonfunctional. Instead of forming farmers group every year to meet the target, the focus should be on reviving and strengthening the already existing farmer's group.

Similarly, inter agency coordination for the effective functioning of the farmer's group needs to be maintained. Instead of all the departments forming separate groups in the some village, they could work the same group and increase the efficiency. Though some weaknesses, the overall assessment of the program was quite positive. The farmers were found to be benefiting from the program. And the production and productivity of the pocket areas were found to be better compared to non pocket. During PRA, most of the farmers are of the opinion that the annual growth rate of overall agriculture production was around 1% in the potential areas of Sindhupalchok district.

10. CONTRIBUTION OF AGRICULTURAL SECTOR PROGRAMS IN EMPLOYMENT GENERATION AND POVERTY ALLEVIATION, 2003

Executive summary

Agriculture has been a principal sector of the Nepalese economy for the past several decades. With this reason, agriculture sector has been accorded top priority in the planned development efforts of Nepal. In this connection Directorate of Economic Analysis and Statistics (EASD) of the Department of Agriculture (DOA) planned for a study for the fiscal year 2059/60 with the objective to assess the effectiveness of agricultural sector programs in reducing the poverty and increasing the rural employment situation. EASD entrusted to carry out this study to paragon pvt. Ltd.

The study is limited in two selected VDCs of Chitwan district, one with intensive access of district level agricultural programs and another with poor access to such programs. The study focused to assess the effectiveness of annual programs implemented by DOA/DADO and DLS/DLSO in respect to their appropriateness for poverty reduction and employment generation. The approach for the study follows the review on agricultural programs specially of DADO and DLSO, review of district and VDC level relevant secondary information for a reference period of 5 years (1995/96 to 2000/2001), personal and group discussion with implementing offices at district and farmers groups and an overview of the current production level, employment situation and productivity status of major agricultural products based on the 32 limited number of households of the two VDCs.

In recent years DADO of Chitwan district has been implementing major programs of cereal, cash and vegetable crops and fruits. The implementation process is based on APP's thrust on *priority package program*. Heavier coverage of programs was found on cereals and vegetable crops. District livestock Services office on the other hand, has more focus on commercial milk production, goat rising and pig rising as their major programs. The programs of both organizations are very scantily distributed in comparison to total district population and area. Thus apparently the emphasis of the

programs seems more on extension and demonstration purpose rather than on to mass coverage target, especially targeting poverty reduction and employment generation. Unlike DADO's annual programs, some of the DLSO programs are found more inclined toward generating direct income to farmers. Although scantily covered, DLSO's program on poverty reduction, Davit, and women's income generating activities is found closer to these aspects whereas, vegetable production and fruit farming of DADO is found with more implication on the poverty reduction and employment generation. However, the total coverage of these programs is by and large meager.

In respect of review of impact of agricultural sector program of Nepal on production and employment, the observation of the last five years period (95/96 to 00/01) shows that although the production has risen, the productivity of major cereal crops have been relatively stagnant. Some increases in non-cereal crops are found which are mainly due to increase in production of potato, tea, tobacco, coffee and some vegetable crops. In livestock front, neat animal production, pig and ducks production have apparently gone up to show a remarkable increase in the production level. Similarly, fish production has also up remarkably.

In the Chitwan district, in contrast to the national figures, cereals, especially paddy, maize and barley production has increased remarkably. Similarly, potato, vegetables, fruits also show encouraging picture. Areas of livestock production, chicken and meat production similarly show good results. However, oilseeds, pulses and sugarcane production show discouraging results.

The general statistical information of the survey VDCs show that there is a significant difference in the general resources including agricultural land available within the two VDCs. Such agricultural land available in Bhandara is 890 ha, and for Korak it is 488 ha. Out of this, Bhandara has altogether 532 ha, irrigated and 269 ha, partially irrigated area whereas Korak has only 70 ha, irrigated and 30 ha, partially irrigated area. Contrarily, Korak has a more than 50% upland area (329 ha,) but Bhandara has only negligible upland area 10% (89 ha.). Total number of households in Bhandara and Korak are 1904 and 1005 respectively.

Bhandara VDC has rice and maize as the major crops in the monsoon season. In winter maize, rapeseeds, lentil, and wheat are the crops that occupy major chunk of area. In rest of the lands potato, onion and vegetables are grown, in korak, maize and millet are the major crops that occupy the majority of the agricultural land in monsoon season. Rice is the third ranking crop grown. Rapeseeds, wheat, potato, and onions are grown in small chunk of areas in the VDC in winter season. Besides, horse gram and black gram are major pulses grown in Korak which are grown in uplands. The VDC level data show that crop yield for major cereals, rice, maize, potato etc are quite higher in Bhandara as compared to Korak. Crop area and production levels are also accordingly higher in Bhandara.

Bhandara is a vegetable production pocket area. Vegetable produced from this VDC is supplied to Naraayanghat and from there to Kathmandu and Pokhara too. A Variety of vegetables are produced in Bhandara area; among them cauliflower and cabbages are most important. Besides this, okra, tomato, radish, pea, pumpkin, gourds etc are other important vegetable crops produced.

Vegetable produced in Korak is primarily for the household consumption. Commercial production of vegetable in this area is rare, since there is no opportunity for marketing so far mainly due to the transportation problem. Limited products such as garlic, ginger and turmeric are, however, marketed.

As per the perceptions of ASC staff, agricultural service programs implemented by the center are useful to farmers among which cereal crops, vegetables and fertilizer application are the particularly beneficial programs to the farmers. The ASC staff perceives use of improved seed, fertilizers, and insecticides have resulted in boosting production for the last five-year period. Cropping intensity in this period has also increased. However, fruit farming and irrigation facility are not growing fast to match with the other inputs.

However, the staff members view that present sets of programs are not sufficient to reduce poverty and increase employment to the desirable level. Their suggestions are to include additional programs in the DADO as targets that have direct focus to

vulnerable and poor people by adding credit and skill development programs.

In the livestock front the ASC perception is that goat, poultry and pig rising is the most effective and suitable programs that have direct impact on poverty reduction and local employment generation. The DLSO program within the last five-year period has helped to bring positive impact in imparting knowledge on animal health and feed management. Livestock production has been positively influenced. This has also some impact on employment regeneration. However, they also feel that programs are not sufficient in terms of their coverage or magnitude and hence require wider coverage with specific focus on poor and vulnerable people.

Regarding the feeling of the local farmers on the effect of agricultural programs, farmers from Korak view that their VDC has been one of the most remote and backward in the district. Agricultural programs have barely reached them. Being an upland and rain-fed area, there has been less scope of effectiveness of crop development program in this area. The interpretation of farmers group in regard with the poverty alleviation and employment is found to be more from livestock and fruit farming activities.

This is in contrast to the feelings of the informants from Bhandatra. The farmers from Bhandara VDC seem to feel that there is good impact from agricultural programs especially from crop, vegetable people are not clear. The farmer's perception in this regard is that such people require some additional programs that have a direct and special focus to them only.

In general farmer's comment indicates that both areas lack irrigation facility which is a prime factor to get benefit from agricultural programs supported by DADO/ASC. In case of Bhandara, farmer's additional needs are more on agricultural inputs and training on skill development. In contrast to this, farmers from Korak have their need on more support on income generating and skill development programs. This indicates a lower potential to benefit from improved crop farming system. They also seem to have the end for special focus on credit facility for income generating activities.

The summary provided from household survey show some changed picture of these

variables for the two selected VDCs for study, i.e., Bhandara and Korak situation for the whole groups of sample farmers. From the findings it is evident that cropping intensity for Bhandara has changed from 212% to 232% within the five years period. Similarly production has increased by 54.23% showing a remarkable change, which is mainly from increase in production in vegetables, potato and spring paddy and spring maize. The labor employment has increased by 20.2%. On the other side of the picture, regarding the less accessible area Korak, cropping has reduced from 1.54 to 1.45 and the production and employment however increased by 0.93% and 5.47% respectively. The decrease in cropping intensity is mainly due to the shift of cereal crop area to banana farming. Here the only encouraging result is increase in labor employment, which has been increased due to slight increase in fruit farming (banana).

The change in the production, intensity, and employment situations however are found varied depending on land holding or income strata, both at Bhandara and Korak VDCs. The finding suggests that in Bhandara mostly small farmers show better increase in intensity, production and employment. In case of Korak, however, the situation is not encouraging particularly for lower strata category. In Korak, even the large strata are not able to show better changes in productivity and labor employment.

Information obtained show that there is no significant change in the amount of sale of farm produce in Korak between the period 1995/96 to 2001/02 whereas crop sale has gone up in case of Bhandara. In both areas, however, the surveyed sample households do not happen to have any other off-farm activities to add income to the family. In both areas, a few cases are found having some sort of agro-enterprises such as rice-mill etc, which are of higher incidence in Bhandara area than in Korak. The cash contribution of these activities where they have been, are reported to be quite good.

In Bhandara, crop sells are found existing in almost all strata of farm sizes, although larger sell is obviously seen with the larger farm sizes. However, in case of Korak, only the larger farm size is able to sell some surplus farm crops where as the smaller farm-sizes are not able to sell any surplus farm crops. On the other hand, micro-enterprise activities are found occupied in few cases by the small farm category also in case of Korak area.

The magnitude of off-farm labor employment in both VDCs (except some micro enterprises for some cases mentioned earlier) are found reported almost nil showing no alternate employment opportunity created other than farming activities within the five year period.

The field survey showed that both the average size of livestock holding and annual income from livestock and livestock products has gone little up in both of the areas. However livestock numbers are found more prominent in case of the farmers from Korak than Bhandara. The annual average incomes are however higher in case of Bhandra than in Korak.

The amount of annual income and livestock sizes in both areas are found to be greater in case with the larger farm-size groups, although in both cases, almost all farm-size groups hold the livestock types. The important items for having good income from livestock enterprises are found mostly from sale of milk from cow or buffalo and sell of goat for meat. Thus milk production and goat rising are found to be most significant contributor for household cash incomes.

Based on the review of these indicators, the general observation of the study has been that the programmed areas have some better production, productivity and income level than the non-programmed areas. The average production of almost all crops was significantly higher in the advantaged area. Similarly, the productivity in the advantaged areas are somewhat ahead than that of non-advantaged areas. The employment situation has also been positively affected within this period in both type of program area. However, there have been no evidences to support that new type of employment opportunities have been opened in these other the traditional farming activities.

Major suggestions drawn from the study are: Agricultural extension programs as at present are not sufficient to reduce poverty and increase the rural employment without additional program measures to these people. Some DLSO led programs such as goat raising and milk production are found more relevant to poverty reduction and hence need to be emphasized. Attention should be drawn on the micro agro-

business and micro-enterprise development programs, targeting the vulnerable people by annual agricultural programs in the successive program implementation of district level offices. As vegetable production and fruit farming are found suitable to poverty reduction they need to be oriented more toward the lower income and vulnerable people. The marginal and poor people do not have access to the facilities and programs rendered by the District offices unless they are also supported with easily administered credit and subsidy for poor who cannot be compared as big house entrepreneurs on sham policy of privatization is a sensible policy element. Special attention needs to be paid on this matter. EASD, may especially rake lead in fulfilling the gap of data on livestock and livestock products including cost of production, feed management and livestock health management, which are found lacking for analyzing comparatives and employment situation studies for effective program planning.

11. IMPACT OF OPEN FERTILIZER DISTRIBUTION POLICY ON NEPALESE AGRICULTURAL SECTOR, 2004

Executive summary

Open Fertilizer Distribution Policy was assessed in the sampled VDCs of sampled wards in Doti and Kailali districts. The study has assessed the impact emanating which was found that clear-cut strategies envisioned by APP to increase use of chemical fertilizer at National Level was not realized due to the absent of road network and support to the private dealers.

- The individual household survey with the user and non-user of chemical fertilizer and private dealers at different opinions for streamlining the timely availability of chemical fertilizer, which could have increased agriculture productivity, ensuring food security and reduction of poverty in the hill district. However, this study found that the use of chemical fertilizer by users in the hill district in the sampled areas of Doti has been increasing whereas the non-users do not have knowledge on the application of chemical fertilizer.
- In terms of market accessibility, road network, irrigation facilities and access to agriculture service extension, the study areas was divided in two categories; accessible and non-accessible in the both Hill and Tarai Districts. In consultation with respective DADO of both districts the sampled VDCs were selected for the survey. For the purpose of household, 40 households from two wards of the sample VDCs were interviewed. Out of which 20 were non-users of chemical fertilize both districts the sampled VDCs were selected for the survey. For the purpose of household, 40 households from two wards of the sample VDCs were interviewed. Out of which 20 were non-users of chemical fertilizer. Pachanali and Kalona VDCs were selected from Doti district as an accessible and non-accessible respectively. Similarly, Geta (accessible) and Beladevipur (nnpn-accessible) VDCs were selected from Kailali.
- In terms of read accessibility, Agriculture Service Center in nearby area and

other relevant facility, Pachanali was selected as an accessible VDC from Doti district and Kalona, which is not attached with any types of road network, and other facilities, were selected as non-accessible VDC. Similarly, having all facilities of basic infrastructures and town oriented VDC; Geta was selected as an accessible VDC from Terai area of Kailali district. From the same district, Beladevipur was selected as non-accessible VDC due to lack of basic infrastructures.

- The demographic composition one of the study area based on accessible sampled hill area was dominated by female in ward-2 and male dominated in ward-6 of pachanali VDC. In non-accessible area has also male dominated in ward-3 and female dominated in ward 6 of Kalona VDC. The population status of Terai district, based on total population is dominated by male in all types of respondents; users and non-users in both accessible and non-accessible areas.
- The average family size is 7.93 on the basis of total respondent households in hill and 6.00 in Terai.
- Among the users and non-users of chemical fertilizer on the basis of total respondent households 56.31% from accessible hill and 76.96% from non-accessible hill, 54.22% from accessible Terai and 76.96% from non-accessible Terai are economically active aged population.
- The percentage of the Higher Level Education is more (5.97%) in accessible area and 1.34% in non-accessible in hill area. The figure of higher education appears to be lower in non-accessible area that is 5.97% vs. 1.3%. In the Terai area, literacy rate of accessible VDC is higher (58.09%) of non-accessible VDC.
- The main occupation of the study area of hill district is agriculture (75.33% inaccessible VDC and 80.65% in non-accessible VDC) followed (21.22% in accessible VDC and 15.48% in non-accessible VDC). However, 1.86% from accessible VDC and 3.55% from non-accessible VDC earned from wage

labor. Very nominal percent (1.86% in accessible and 0.32% in non-accessible VDCs) of population engaged in business in both VDCs. In Terai area, 86.60% respondent households depended in agriculture 4.05%, 4.36% and 4.98% respondent household apply Service, Business and Wage labor respectively. In the meantime, out of total population of above 14 years aged from the non-accessible area, the large majorities (98.05%) are depended in agriculture and rests are engaged in other occupation.

- In the case of landholding size of the respondent of hill area, the average land size of chemical fertilizer users is 0.54 ha, (21.4 ha total) and average UN irrigated land size land size is 0.93 ha. (15.60 ha. Total land area is 37.25 ha. On the other hand, land holding of non-users, both irrigated and un irrigated is 12.25 ha, and 11.00 ha, the total land area is 23.25 ha, the average land size of the non-user is 0.31, 0.28 and 0.58 ha, as irrigated un irrigated and total respectively. In case of non-accessible VDC, the size of operational land was lower than the land size of accessible VDC. The average irrigated land size of chemical fertilizer user was 0.44 hectare, UN irrigated was 0.25 hectare and the total was 0.68 hectare per household. However, the average irrigated, UN irrigated and total land size of non-users of non-accessible VDC was 0.20, 0.18 and 0.37 hectare respectively.
- In the accessible Terai the land holding size of the study households the average irrigated land size of the user of chemical fertilizer is 1.35 hectare, and average UN irrigated land is 0.17 hectare. Among the non users of chemical fertilizer, the average irrigated land size is 0.90 hectare and UN irrigated is 0.33 hectare. The total average land size of the user of chemical fertilizer is more than the non-users of chemical fertilizer. In non-accessible Terai, the average irrigated land size of chemical fertilizer user is 0.78 hectare and UN irrigated was 0.28 hectare. Similarly, the average irrigated land size of the non-users of chemical fertilizer is 0.53 hectare and UN irrigated is 0.43 hectare. The total average land size of non-user was less than the users.

The farmers of hill area use the chemical fertilizer in major crops only in irrigated

land, so as the increasing rate of production and productivity is less affected in non-irrigated land compare to the irrigated land. However, the non-users of both accessible and non-accessible area are not used chemical fertilizer in the crops either due to lack of knowledge or lack of affordability to pay for chemical fertilizer. In Terai, the farmers who use chemical fertilizer are applied chemical fertilizer in all crops due to accessibility of market in accessible area. However, the farmers of non-accessible area use the chemical fertilizer only in main crops; wheat and maize cultivated either in irrigated or UN irrigated land.

- Almost of the uses of chemical fertilizer from both Hill and Terai area moderately used urea and DAP. However the users basically from the Terai area used Muriate of potash as their requirement. The using trend of chemical fertilizer is increasing gradually after the formulation of open Fertilizer Distribution policy. On the other hand, the production status of crop is also increasing but it is not increasing an input of fertilizer.
- The price of chemical fertilizer is increasing every in both areas; Hill and Terai but the increasing rate is much higher in hill district compare to Terai due to competitive market in Terai and less competition in Hill. The availability status of chemical fertilizer is sound in accessible area of both Hill and Terai area; however the users of non-accessible are procuring the chemical fertilizer from the same market area as used before 1997 due to inaccessibility of road network.
- Annual distribution rate of chemical fertilizer by the distributors is increasing rate in both Hill and Terai districts. The distributors who are selling chemical fertilizer from five or more year have sold greater volume than the new distributors. Some of the distributors of belonged to Terai are distributing to small distributor in wholesale price so that the total turnover rate is more than the retail distributors. Due to involvement of private sector in distributing chemical fertilizer, the annual turnover is constant of AIC (in Dipayal).
- The seasonal distribution status of chemical fertilizer is much similar for rainy

and winter crops in both Hill and Terai area. There is no practice to apply the chemical fertilizer in other crops in Hill area. However, the users of Terai area have practiced to apply the chemical fertilizer in other cereal crops such as vegetable and legumes.

- In essence this study recommends for review of policies envisaged by APP and other working modalities provided through regulation for private participation in distributing chemical fertilize in different terrain of the country. This study also recommends for promoting chemical fertilizer particularly in the Hill Districts with support to the private dealers by providing soft loan through ADB/N, other commercial banks and other Cooperative Societies. The existing Cooperative Societies can be mobilized to undertake the distribution of chemical fertilizer in remote areas.

12. COMPARATIVE COST BENEFIT OF CITRUS FRUITS PRODUCTION IN NEPAL, 2005

EXECUTIVESUMMARY

Agriculture plays pivotal role to uplift the economic condition of Nepalese people. Among the agriculture sector, the citrus crops have been recognized as major high value crops of mid hill of Nepal. The present study on comparative cost benefit of citrus fruits production in Nepal has carried out taking two districts from eastern development regions, one district from central development region, one district from western development regions and one district from far western development regions.

The study districts were Dhankuta, Illam, Sindhuli, Tanahu and Dadelahura, consisting two potential pockets of citrus (mandarin, sweet orange and lemon) from each of the selected districts. From selected pockets twenty farmers from each of the pockets were selected.

The average density of citrus was found 17 trees per ropani. The farmers were using

sapling and seedlings both for planting materials and they were poorly applied measures to control diseases & insect pests. Majority of citrus trees of the study districts were found bearing stages.

Competitive crops of citrus in Nepalese farming system are maize, millet and *Ghaiya*. The fantastic change of income level of farmers after growing the citrus were observed and average Farmgate price was Rs 10,46,8.22 and 21.86 per Kg of Mandarin, sweet orange and lemon respectively. The farmers of Sindhuli have fetched lower prices as compared with other district farmers.

The result showed that amongst the different marketing problems on average 98.5 percent citrus growers reported that there is a problem of organized market followed by training requirement, transportation, market price, price behavior, marketing information, and packaging/grading, respectively. Thus the study strongly need to construct organized market with facilities and trained to the farmers about market activities.

There is potentiality of seasonal export of citrus to our neighboring country India (particularly Bihar and West Bengal) and Bangladesh. The quality of citrus of Nepal has been ranked better, so there is scope in exporting India and Bangladesh.

The following are the recommendations made by the study:

- Production centers are scattered and are considerably far from major market centers thus, high cost of production resulting from high of inputs and small scale production.
- Packages of appropriate production technology are lacking and thus need to coordinate research and extension services regarding citrus production.
- Input distribution system is weak due to lack of agricultural road, transport and communication facilities so governmental investments of these sectors are highly recommended.
- Availability of storage facilities are lacking.
- To fetch benefits from market, horizontal and vertical linkages between and

among production, marketing and processing industry and integration between and among production marketing and processing activities and institutions are needed.

- Participatory program planning with farmers groups as seems to be well equipped. However, there is need of cooperative movement for further strengthening the diversified products through processing in a sustainable way. Campaigning and effective implementation of Pocket Package Strategy (PPS) and made adequate supplies of inputs like irrigation, fertilizer, credit, technology, infrastructures.
- Intensive training Packages on disease and pest control by **IPM**, harvesting techniques, reduction post harvest losses, handling techniques of transportation, loading, unloading and selling.
- Explore alternative measures such as establishment of small scale citrus

processing industry, development of collection center, linkage with big wholesaler, cellar storage based on the level of production and agro-ecological belts.

13. STUDY ON MARKETING SYSTEM OF EXPORT ORIENTED AGRICULTURAL COMMODITIES: Tea, Betel nut, Cardamom and Ginger in Selected Districts of Eastern Development Region, 2005

EXECUTIVE SUMMARY

The Agricultural Perspective Plan (APP) has emphasized the marketing of high value agricultural commodities as a driving factor towards the transformation of existing traditional agricultural system into a commercialized and market driven production system. To support the sectoral objectives and strategies, the Directorate of Agribusiness Promotion and Marketing (DAPM), Market Research and Statistics Management Program (MRSMP) – Department of Agriculture has taken an initiative to conduct a study on 'Marketing System of Export oriented Agricultural commodities: Tea, Betel nut, Cardamom and Ginger in Selected Districts of Eastern Development Region of Nepal'.

The broad objective of the study was to conduct study on marketing system of export oriented agricultural commodities viz. Tea, Betel nut, Cardamom and Ginger in selected districts of Eastern Development Region of Nepal in order to achieving the goal of promoting the production as well as commercialization of these crops.

The study was focused to; assess the cost-benefit position, analyze the comparative advantage, analyze the production potential and existing marketing system, marketing channels and marketing margins, conduct SWOT analysis, provide suggestion and recommendations to change production through improvement of marketing system and suggest ways and means to materialize the envisaged outcome for the tenth plan period.

For this purpose, sample of production areas were selected from of Illam and Dhankuta

for tea, Dhankuta and Illam for Cardamom, Morang and Jhapa for Betel nut and lastly Illam, and Dhankuta for Ginger. The study areas were selected purposively in each district.

To ensure effectiveness of the study, process management was adopted at all stages of the study. The available related publications and reports from DAPM, MRSP, DOA, CBS, NPC and other related agencies were extensively reviewed. Different tools and techniques of PRA such as key informant interview, focus group discussions, direct observation, individual interview and stakeholders' workshop were used to collect the desired information for the study. A prepared set of questionnaires was used in order to collect the desired information for the study. The information thus collected was analyzed and presented.

The average cost of production of ginger in Illam is Rs 4.40 per Kg and in Dhankuta is Rs 4.30 per Kg and about 50% of which is contributed by seed rhizome. The net return per hectare of ginger cultivations in Illam and Dhankuta is Rs 112638.00 and Rs 112684 respectively. Similarly the net return from cardamom is slightly lower than the ginger and from tea is similar to it. The highest net return is found from betel nut farming.

Higher returns per unit area, use of more labor force and higher employment, use of un-irrigated Bari land other marginal lands, environmental friendly and greater export potential are the major indicators indicating higher comparative advantage of ginger, cardamom, betel nut and tea over other competing crops in the studied areas.

The ginger, cardamom, betel nut and tea produced in the production pockets pass through different channels before reaching to the terminal market and ultimate consumers. The monopoly market, price variations on seasonal and market basis, involvement of many marketing channels along with market infrastructure and higher marketing margins are found major marketing obstacles of these crops.

There is tremendous scope of increasing the production of tea, ginger, cardamom and betel nut in Nepal in general and in eastern development regions in particular. The

production of these crops could be increased both by expansion of area under these crops and increasing the productivity.

India, Pakistan, Bangladesh and other oversea countries are the potential markets for Nepalese ginger and cardamom. These are the larger markets having higher potentiality of increasing export of these crops. Nepal is the exporter and importer of tea and betel nut. There is higher potentiality of import substitution and export promotion of these crops.

The tea, ginger, cardamom and betel nut production and marketing in eastern Nepal has greater strengths with higher opportunities than other traditional crops grown in this region. These strengths and opportunities in production and marketing of these high value crops could be explored and export of these crops be increased through the directed efforts to improve the weakness and to mitigate constraints.

Some identified problems in the production and marketing of ginger, cardamom, betel nut and tea as important constraints to commercialization and diversification areas;

Ginger

- Lack of Suitable varieties for processing and processing and product diversification
- Lack of proper production management and poor production practices
- Higher incidence of rhizome rot and other diseases
- Lack of proper crop rotation
- Weed research and extension support
- Lack of processing method
- Lack of established marketing information system
- Lack of marketing network and market infrastructure
- Poor storage, packaging and handling techniques
- Difficulties in transportation and post harvest handling
- Lack of farmers' institution

- Limited trading partners and products
- Trade and non-trade barriers

Cardamom

- Lack of high yielding and disease free varieties suitable to specific conditions
- Adoption practices
- Higher incidence of viral and rhizome rot diseases
- Weak research and extension support
- Lack of proper drying and processing method
- Lack of marketing information system
- Lack of marketing network and market infrastructure
- Poor storage, packaging and handling of the produce
- Lack of farmers' institution

Betel nut

- Lack of improved production practices at the farmers field
- Lack of disease free and high yielding varieties suitable to local conditions
- Higher incidence of diseases and pests
- Weak research and extension support
- Lack of proper processing and post harvest handling method
- Weak marketing information system
- Weak marketing network and infrastructure
- Lack of well-developed farmers' institution

Tea

- Poor production practices
- Weak research and extension support
- Weak marketing information
- Lack of farmers' institution

- Production of less competing product

Keeping in view of the targets envisaged by the Tenth Plan and the problems stated above, following crop specific recommendations have been made to materialize the targeted programmed.

Ginger

- Introduction and expansion of high yielding fibreless varieties
- Promotion of improved production practices
- Adoption of proper crop rotation
- Development of strong and effective research and extension backup
- Promotion of proper processing and storage techniques
- Establishment of marketing network and market
- Develop the marketing information system
- Develop and disseminate proper packaging, storage and handling techniques
- Connect toad-networks in the production pockets
- Promote and strengthen producer farmers' organization/cooperatives
- Efforts for trade and product diversification of ginger
- Deliberate efforts for trade promotion

Cardamom

- Introduction and expansion of high yielding disease resistance varieties
- Promotion and dissemination of improved production practices
- Establish strong research and extension backup support
- Promotion and dissemination of processing and storage
- Establishment of Marketing Network
- Well-developed marketing information system
- Develop and disseminate the proper packaging storage and handling

- Facilitate and strengthen the farmers' organization/cooperatives
- Deliberate efforts for trade promotion and market diversification

Betel nut

- Promotion of improved practices
- Introduction and expansion of disease free high yielding varieties
- Build the strong research and extension backup
- Promotion and dissemination of processing and storage techniques
- Establish marketing network and infrastructure
- Promote the marketing information system
- Develop and disseminate proper packaging, storage and handling techniques
- Facilitate and strengthen farmers' organization/cooperatives

Tea

- Promotion and dissemination of improved techniques of production
- Develop the strong research and extension backup to the producers
- Establish the marketing information system focused to tea marketing
- Facilitate and strengthen the farmers' organization/cooperatives
- Facilitate and promote the farmers to produce organic tea
- Develop the specific brand name and quality standards of exportable Nepalese tea
- Increase efforts for trade promotion specially to explore export market and import substitutions

14. STUDY ON IMPROVING FISH MARKETING SYSTEM IN THE SELECTED TERAI DISTRICTS OF NEPAL, 2006

EXECUTIVE SUMMARY

Marketing System determines marketing policies and marketing system has to be researched before policy making can start. This research is an effort to assess to what extent the marketing system and marketing channel contributes to fish production and livelihood of the people and vice versa. The consultancy service is concerned about the study of improving fish marketing system in the pocket area of Terai districts of Nepal. The agreement was commenced between Gaurav Integrated Development Associates, Nepal and Department of Agriculture, Marketing Research and Statistics Management Program of Ministry of Agriculture and Co-operatives.

Even if, various efforts were practiced to flourish the fish market, these would still be unable to develop fish market in a desired manner. This study is undertaken in response to the growing level of public awareness regarding the fish marketing system in the country. The major objective of the study is to promote and strengthen the marketing system with a view to commercialize the fish farming. This study is also expected to provide quite relevant information regarding production, marketing system and channel, cost benefit situation of fish production, constraints areas, alternative channels and market margins.

A team of experienced and well qualified professionals having a Team Leader/ Economist and Fisheries Specialist and a number of techniques such as RRA, PRA, Focus Group Discussion, Direct Observation, and Household Survey etc. were for the collection of primary information. This primary information was supplemented with various relevant secondary information/data. Dhanusha, Bara and Chit wan districts of Central Nepal were selected as a study area for this research.

Marketing has a central role in the management and development of a fish farm. The key to successful marketing lies in understanding that the closer the fish farm can come to supplying customers with what they want, the more they will buy or the more they will be prepared to pay. So it is necessary that the fish farmer has to out exactly

which customers and suppliers are part of his marketing system. In this context, a good communication and co-operation between producer and marketing agencies can create an environment for the development of the fish marketing system in the community.

The study reveals that appropriate marketing system can be developed by a joint effort of private and public sector. To establish appropriate marketing system from the production area to consumer there must be a kind of marketing mechanism where producer may get proper opportunity to sell their products in a good price. Likewise, it is essential to draw attention to minimize the profit margin for middlemen, in order to improve fish marketing system. This study also reveals that a collective effort of producer is needed to eliminate the dominant role of middlemen; I. e. a concept of co-operative marketing should be developed from grassroots level to the central level.

The existing marketing system prevailed in the study area and other area of Nepal is unable to flourish fish marketing system. After a deep diagnosis of problem, this study put forward the following contributing factors that affect the whole marketing system.

- Availability of fingerling/hatchlings
- Conflict among the people
- Lack of marketing information
- High transportation cost
- Absence of cold storage facilities
- Lack of proper training/technical manpower
- High interest rate in loan
- Lack of marketing co-operatives
- Elastic demand
- Unfair competition/foreign competition
- Political cause etc.

Nepal, as a grain economy, it should focus in the development of fish farming. This is the time for Nepal to correct past and present mistakes. This study is also expected to provide important implications for the better design, implementation, monitoring, and development and strengthen the fish marketing system on a long-term basis.

15. FARM MANAGEMENT PRACTICES IN SELECTED DISTRICT

OF NEPAL [A follow-up study], 2011

Summary

The main purpose of this "Farm Management Study" is to identify and analyze farm-level resources in terms of their availability and how they are being allocated/ utilized over the time period. This is a follow-up study of the similar previous work on the National Farm Management Study, which was carried out in 1983-85 by then the Economic Analysis Division, Department of Food and Agricultural Marketing Services (EAD, DFAMS).

For this study three districts Mustang, Gulmi and Rupandehi were selected as the sample-districts, respectively representing high, mid- hills and the tarai (Plain), three distinct ecological regions of Nepal. From these, one cluster from each has been chosen viz Marpha of Mustang, Aanpchaure of Gulmi and Bisnupura of Rupandehi district. From each of the clusters, the number of respondent farmers was selected based on criteria set in the previous study. Some old respondents were also found during the field-survey, while most of other respondents were either from new-households or belonging to new-generation. This was but inevitable as there exist nearly 27 years gap between the present study and its predecessor. Perhaps it is worth mentioning that the present Program-Chief was one of the key research-officers, who were deeply and actively involved in the first (and only) "National Farm Management Study (1983-85)" from its very initial phase till its completion. In a way, this follow-up study is attributable to passion and personal interest of the program-chief to contribute to this long awaited void in the yield of the farm management study.

The study was carried out with limited human and budgetary resources. In particular it was carried out with the assistance of two Agricultural economists and limited budget. A semi-structured questionnaire was used whose contents were similar to the parameters used in the previous study. However, the questionnaires and list of farmer respondents related to previous-study, which could be of big help for developing

work frame for comparative analysis, could not be found. Nonetheless, the findings of present study could be considered significantly comparable to the findings of the previous study to obtain a comparative picture, as both of the studies were based on same clusters and similar number of farm households. In addition to household information, some cluster level information was also collected. Besides, temperature and rainfall data were collected from the nearest meteorological stations through the Department of Hydrology and Meteorology, Nepal Government for the respective years.

Main findings are summarized below:

Average household size was found highest (7.77) in Aanpchaur, Gulmi followed by Bisnupura, Rupandehi (6.87). This was the lowest in Marpha, Mustang (4.79).

Compared to 1983/84, higher household size (52%) is found in Bisnupura, Rupandehi. In case of Marpha, Mustang, it was reduced by 11 percent and almost same size in Aanpchaur, Gulmi district.

Farm size per household in Bisnupure,Rupandehi is highest (1.75 ha) whereas, it was lowest (0.42 ha) in Aan pchaur, Gulmi. In case of Marpha, Mustang, it was 0.59 ha. This farmsize has been increased by more than 30 percent in both Bisnupura, Rupandehi and Marpha, Mustang compared to 1983/84 average. In case of Aanpchaur, Gulmi, it was reduced by 11 percent over the period.

Livestock population per household expressed in a unit is decreasing over the time period in Marpha, Mustang and Aanpchaur, Gulmi. There is some increment in Bisnupura, Rupandehi district. By farm size there is some reduction on livestock holding in small farm, more specifically in sub group Ia and Ib.

Crop area has been increased compared to the previous study. This means more crops are grown in a piece of land within a year. This is termed as the cropping intensity. This cropping intensity is found more than 200 percent in Aanpchaur, Gulmi and Bisnupura, Rupandehi district whereas

It was 170 and 142 per cent in the previous period, respectively. This higher intensity is materialized with the expansion of irrigation facilities. In Marpha, Mustang district, this is 141 per cent against 110 per cent in previous period. The lower intensity in this case is the higher altitude; however, it has been increased significantly. This is because of irrigation facility as well as some climatic warming. Now, barley is followed by buckwheat in a year and potato, oats and wheat can be grown within two years,

Agricultural labor supply is found decreasing in Marpha, Mustang and Aanpchaaur, Gulmi. This shortage of agricultural labor has induced to raise the wage rate, which affects on rising cost of production. In case of Bisnupura, Rupandehi, this increased wage rate has forced to replace with mechanical devises. Economics of mechanization shows that there is 41 percent cost reduction in first ploughing while replacing tractor to bullock power. This mechanization is found in Bisnupura, Rupandehi district.

Regarding climate change, Marpha, Mustang is getting warmer even in winter. The minimum temperature has been increased from -5 to -0.8 over the study period, which has negatively affected on oats production, the native food grain of high hills. As the result, maize is gradually replacing to oats. Also, there are more insect and pest problems on apples faced by farmers. Now chilies are growing in this Marpha area which also indicates the impact of climate change. This rising temperature has direct impact on more rainfalls as shown by the past records. In Gulmi, the total annual rainfalls are found higher (2611 ml) against base year (2148 ml). In case of Rupandehi, there is not significant change in temperature. Regarding rainfalls, some lesser total annual rainfalls (1702 ml) for 2007-09 are recorded against 1983-85 average rainfalls.

Summary of major findings by cluster for all farms over the time period

Description	Unit	Findings		Changes
Household size (No/household)	No	1983/84	2010/11	
Marpha, Mustang		5.4	4.79	-11
Aaapchour, Gulmi		7.4	7.77	5
Bishnupura, Rupandehi		4.52	6.85	52
Farm size (ha/household)	Ha			
Marpha, Mustang		0.45	0.59	31
Aaapchour, Gulmi		0.47	0.42	-11

Bishnupura, Rupandehi		1.3	1.75	35
Cropping Intensity	Percent			
Marpha, Mustang		116	141	22
Aapchour, Gulmi		170	207	22
Bishnupura, Rupandehi		142	215	51
Farm labor supply	Household			
Marpha, Mustang		4.3	3.79	-12
Aapchour, Gulmi		4.8	3.1	-35
Bishnupura, Rupandehi		2.6	3.69	42
Farm labor supply	Crop area			
Marpha, Mustang		8.26	4.58	-45
Aapchour, Gulmi		6	3.55	-41
Bishnupura, Rupandehi		2	0.98	-51

Food grain sufficiency indicates that more percentage of farmers in Aanpchaur, Gulmi are facing food shortages compared to other two Study areas. The summary table presents this fact in details.

Foodgrain sufficiency indicators

SN	Food sufficiency months	Percentage of households		
		Marpha, Mustang	Aapchour, Gulmi	Bishnupura, Rupandehi
1	Less than 3 month	21	26	
2	3-6 months	7	32	8
3	6-9 months	29	16	19
4	9-12 months	43	26	73
5	No of observations	28	31	26

Source : Field survey, 2011

The average annual household income varies by cluster to cluster. It is lowest (Rs.102,350) in Aanpchaur, Gulmi and highest (Rs. 411,358) in Marpha, Mustang. In case of Bisnupura, Rupandehi, it is estimated to be Rs.123,039. By source, apple contributes major share (63%) in Marpha, Mustang, while remittance shares 76 percent to total household income in Aanpchaur, Gulmi. In the same way, agriculture products sales have contributed 66% in Bisnupura, Rupandehi.

Conclusions

Off farm employment opportunities, remoteness of local area and increasing awareness in education for children are forces for migration, which influences household size. This conclusion is based on the basis of Marpha, Mustang. As the result, the household size is being reduced from 5.40 to 4.79 in 2011. This conclusion is also equally valid for high hills including Manang and other remote areas of mid hills. In case of Aanpchaur, Gulmi, youth males are in abroad and their families are living jointly. So there is almost similar household size over the period. However, this foreign remittance certainly will force to migration in near future. This response is made by the local residents during the field visit. In Bisnupura, Rupandehi, the average household size is found to be 6.85; this seems ideal size in response of the farm size and the demand for agricultural labor.

The reduced household size in Marpha, Mustang is the main reason for bigger farm size compared to the earlier study. Many relatives have rented their land while leaving to other areas. Similarly, some reduction in farm size is found as compared to previous study in Aanpchaur, Gulmi. As the result, labor supply in agriculture has been reduced by 35 percent despite the higher household size due to numbers of young children. This phenomenon (shortage of labor) is common in the hills as found in other visits. Similarly, agricultural labor force is decreasing by 11 percent in Marpha, Mustang. In case of Bisnupura, Rupandehi, the farm size is sufficient to check out the migration. From these analysis, it is concluded that appropriate farm size is to be determined to retain sizeable labor force in agriculture within the household due consideration of farms as a business unit. For example at least 0.5 ha(10 Ropani) should be a basis for commercialization.

Livestock size is decreasing in Marpha, Mustang and Aanpchaur, Gulmi. This is mainly because of the labor constraint and decreasing pasture areas/fodder crop areas. In case of Bisnupura, Rupandehi, the small holders have lower livestock size compared to the previous study. The economics of livestock needs to be explored.

Increasing cropping intensity indicates growing facilities of irrigation over the period. In Marpha, Mustang and Aanpchaur, Gulmi, even uplands are found irrigated for a certain months. This facility has induced to grow more crops in a year. Similar

conclusion can be drawn for Bisnupura, Rupandehi.

Agriculture labor shortage is the big problem throughout the areas as shown by reducing household labor force. This has induced for rising wage rates of labor. These findings suggest shift towards demand responsive farming practices along with mechanization in agriculture. In Bisnupura, Rupandehi, tractor, pump sets and threshers are being used. It is found more economical to use mechanical devices compared to manual labor.

Impact of climate change in Agriculture: There is some impact of climate change in agriculture especially in Marpha, Mustang. In case of other areas Marpha, Mustang are mentioned below:

- Shorter period of snowfalls (late) has affected late plantation of oats/naked barley
- Early flowering and fruiting of apples and other fruits
- Disease and pest (insects and fungicide) problems are occurring on apple and maize.

More food shortage is found in Aanpachaur, Gulmi, compared to other study areas. This is because of smallest farm size and biggest household size. Similar conclusion is to be drawn for Marpha, Mustang. In case of Bisnupura, Rapandehi, this food shortage level is lower compared to hill and high-hills due to higher size.

To combat the food shortage caused by small farm size and traditional practices, off farm employment opportunities are the main contributing factors as is found in Aanpachaur, Gulmi. In case of Marpha, Mustang, despite the small farm size, apple plantation has become the strong reason for food shortage after the connection of road network to the national highway. The price has increased from Rs 10.00 per kilo to Rs 70.00 this year. This lesion is equally fitted for other remote areas. This means, technology, market and road network is vital components along with the credit to turn agriculture into a business unit. Tarai farmers have own products for their livelihood

due to larger farm size. In this area, the physical infrastructures are found for the technology expansion.

Recommendations

Based on the conclusions some recommendations are mentioned below with due considerations of cluster specific characteristics

Marpha, Mustang.

- ❖ Apple-based farming system is emerging in Marpha, Mustang. This area is road connected. Now, the apple producers are getting both prices and market. However farmers are facing pest problems. So either suitable variety is to be replaced or provide corrective measures in response of the climate change. For this, Nepal Agriculture Research Council should initiate to correct these issues. The Horticulture Farm needs to play the links between the research and the development activities. To minimize risk and uncertainty, emphasis is to be given for other market- oriented horticultural crops.
- ❖ Agro-tourism including home stay is now popular in Nepal. This location is also ideal for summer stay. This can be extended up to October. The festival of yak blood sucking and on-farm fruit picking will be the attraction of summer home-stay. So District Development Committee can promote agro-tourism industry to check out migration.

Aanpchaur, Gulmi

This cluster can be developed as the organic village along with learning centre. For this, the following activities are recommended.

- Capacity building on organic production, processing (value-added activities) and marketing of products.
- Promotion of horticultural crops through acquisition of arable lands of absentee tillers. Coffee, turmeric, seasonal vegetables can be initiated based on technical feasibility and market demand. Young generation should be focused as the target group.

- This village could also be developed as a learning centre for youths coming from other parts of country and the world.

Bisnupura, Rupandehi

This is rice-based area. So emphasis should be given to increase both production and productivity of cereal grains mainly rice in rainy season and wheat and vegetables including onions in winter. These activities to be carried out are mentioned below.

- System of rice intensification system (SRI) is to be initiated for small farmers having less than 0.5 ha farm area. This system is feasible in those areas where irrigation facility is under command. It is also labor intensive, which can be minimized using mechanical devices.
- Promote level of mechanization (ploughing, transplanting and weeding, harvesting and threshing). For this, the government can encourage farmers providing soft term loans, and exemption of taxes in group/co-operative basis.
- Farmers are getting very low prices during the harvest season. They are bound to sell their products immediately after harvesting to repay the loan, which was taken for crop cultivation. At that time, the price offered even can not meet the cost of production.

This complains is common for years back. To protect farmers, short term loan during planting season is to be provided so that farmers can hold on their produce until prices start increasing, for this the produce could be a basis for soft loan with collateral for a bank loan. The case of Niger country could be an example.

Policy Implications of the study

This farm management study attempted to provide up to date farm level data base and indentify changes of farm resources over the time period. Although this study is a follow-up study and covers a few clusters and district. However, it shows the level of resources mainly household size, farm area, livestock size by ecological region along with comparison with earlier study carried out at national level during 1983-85. This study thus can be taken a base to judge the resource dynamism. Implication of

this study can be taken as a direction for the future work in the followings areas under farm management study.

Study Approach: Farm level data were obtained based on set criteria (same area, farm size, respondent number etc.) in the earlier study. Semistructure questionnaire was used while interviewing individual farmers.

List of farmers along with operated farm area is attached in this report. In future, same households can be revisited and documented information from them and could be analyzed by time framework. The specific issues can be studied in details using Key-informant surveys. Such as impact of climate change in crop diversification in Marpha, Mustang, farm crops in Aanpchaur, Gulmi, shifting farm practices in response of manual labor vs mechanical services in Bishnupura, Rupandehi district, or financial as well as economics of farm mechanization on cost of production etc. Similar issues can be studied in response of farm practices.

Periodical Farm Survey: Farm management practices are changing over the period. Farm size, household size, agricultural labor force, cost of inputs, market prices and now the effect of climate change etc are the influencing factors for resource allocation. So it is strongly recommended that there needs periodical study on changing practices by ecological region. For this simple indicators are to be used. For such survey 5 to 10 years interval will be ideal, which shows the direction towards the areas of farm improvements.

Need farm management extension services: Based on findings, extension services are to be carried out. Such service area could be inputs marketing, technology adoption, cost minimization, expansion of market oriented products. Linking farmers to market, post harvest handling, storing and economics of storing and measures of price stabilization etc are other aspects for the future work. For this, separates technical and financial packages are required due consideration of small farmers and large farmers/companies.

16. AGRICULTURE MECHANIZATION AND COSTS OF PRODUCTION IN NEPAL, 2011/12

This report has concluded the cost of production of some Cereals, Vegetables, cotton & sugarcane and usual production functions with emphasis to semi-mechanized and labor intensive farming context, special emphasis has been given on farm implements. Tractors, tillers, harvesters, pump sets, tube wells and sprayers are being the prime concerned implements for crop farming in Nepal also mainly with the view of labor efficiency and effective production cost. The study might help in throwing some light in agric mechanization as well.

There exists substantial gap in our knowledge concerning critical aspects of farmers' decision-making regarding profitability. Managing capabilities of farmers get improved once they come to realize some facts through available information or documents. The recorded data sets help in recommending to the farmers what to grow, how much to plant, which varieties yield higher and subsequent selection of crop types or varieties; growing conditions, level of inputs and labor intensive or mechanization to be used etc. Farmers get knowledge or confirmation of profitability of farm implements suited to their crops & agro-climatic area. Data on the cost of production /cultivation and farm implements play also important role in the decision making by the planners and policy makers thereby results in the well being of the farmers of even for the purpose of setting up good governance. This report aims to fulfill the above kind of requirement regarding production cost and agric-mechanization in Nepal to some extent.

1. Positive knowledge, skills and attitudes of manpower assures the better results. Human factor is the most important aspect for farm mechanization also even though it reduces the scope of labor use. Operator/machine's working efficiency, bullocks' management and working efficiency, other working energy efficiency etc were the areas for higher priorities under mechanization discussions.
2. Normally used power in farming activities of study sites were animals, human, electricity, solar, wind etc.

3. Oxen, buffaloes, horses, chyangra, and sheeps were the commonly used animals in farming activities in totality. Chyangra, and sheeps were reported only in mountain areas. Electricity is important for modern farms. The sources of electricity energy were hydro, solar, wind, bio-fuel, carbonic fuel etc. Hydro, solar, wind, bio-fuels are the sources of clean energy important to strengthen environment. Minimization in the use of carbonic fuels for farming activities helps to reduce GHG emissions and promote better environmental situation. These all represents good agricultural practices (GAP) and assist to (a) strengthen environment, (b) reduce cost of production (c) increase profit margin and (d) enhance food security.
4. Mechanization has been recognized here as an important engine for agriculture development in Nepal.
5. Enhance commercialization, minimize the COP & cover the lack of human labor by optimizing the agriculture mechanization,
6. Optimize the use of carbonic fuel & maximize the use of clean energy in farm mechanization to reduce environmental pollution,
7. Good agricultural practices to increase working efficiency to increase profit margin.
8. The findings of research not yet reaching to majority of farmers. Use of information and Communication Technology (ICT) in agriculture system is very minimal.
9. Low productivity, less competitiveness soaring food prices and the most pitfall is low priority for agriculture and low budgetary provision for agricultural development.
10. Major Pitfalls of the Existing Practice of agriculture mechanization is inconsistencies on policies implementation (subsidies on fertilizers, shallow tube wells removed from 2002 to 2006). Government of Nepal has developed several policies and programs for the development of agriculture sector like 20 years Agriculture Prospective Plan, National Agricultural policy 2004, Agriculture Business Promotion Policy 2007, National Tea policy, National

Seed Policy, National Fertilizer Policy, Irrigation Policy, Milk Development Policy, National Coffee Policy etc.

11. Agri Engineering Directorate is resource less.
12. Land fragmentation-average farm size 0.24 hectare, labor and mechanization efficiency poor.
13. In some village farmers were found leaving their lands uncultivated mainly due to family labor unavailability and hired labor uncertainty and costliness. As farmers were found struggling with higher cost in production and low market prices or no minimum price assurances.
14. Mechanization has been found helpful to increase cropping intensity by increasing coverage and increase comparative profit than labor intensive farming in existing context of Nepalese farming.
15. Mechanization in Nepal is not to replace human labor but to recover the lack of human labor in village communities.

Shallow tube wells and boring schemes are the core of irrigation mechanization in terai region where as sprinkling, dripping and multipurpose irrigation schemes are important for hill slope irrigation mechanization.

17. STUDY ON AGRICULTURE INPUTS AND OUTPUTS PRICES IN NEPAL, 2011/12

SUMMARY & CONCLUSIONS

This report has concluded the major inputs prices and outputs prices including some value added products. Human labor, bullock labor, tractors, power-tillers, harvesters, pump sets and sprayers, seed, manure, fertilizers & interest on variable costs are taken as the prime inputs for crop farming in Nepal. Likewise, the outputs/products such as rice, wheat, maize, different vegetables, spices, pulses, oils, sugarcane, seeds, etc are also taken in account. The study is useful in throwing some light in farm inputs outputs prices.

Managing capabilities, farmers get improved once they come to realize some facts through available information, documents & observation. The data sets help in focusing the farmers what crop species & variety to grow, how much to plant, which inputs & how much to use and subsequent selection of technologies to be used. Farmers get knowledge of profitability of farming suited to their soils, agro-climatic characteristics, and inputs quality-prices outputs prices opportunities. From the above discussion & findings normally there is an inverse effect of production inputs prices in the products prices. Data on the inputs-outputs prices helps in making the decision for the planners, policy makers, traders & farmers also. This report aims to fulfill the above kind of requirement of farm inputs-outputs prices dimension, to some extent.

Farm Inputs & Outputs Marketing

Pricing the Product

Products broadly can be categorized into two parts such as farm products & manufacturing products. The two basic components that affect product pricing are costs of production and competition in selling. It is unprofitable to sell a product below the producer's production costs and unfeasible to sell it at a price higher than that at which comparable commodities is being obtainable. Other variables also affect

pricing. Marketing policy may require a minimum profit on new product lines or a specified return on investments, or discounts may also be offered on purchases in quantity.

Attempts to maintain resale prices are facilitated as per the guidelines provided. However, these guidelines have been nullified, thereby prohibiting producers from controlling the prices set by wholesalers and retailers. Such control can still be maintained if the producers wish to market directly through their own outlets, but this is rarely feasible except for the largest producers. Attempts have also been made, generally at government insistence, to maintain product-price competition in order to minimize the danger of injuring small businesses. Therefore, the legal branch of a marketing organization reviews pricing decisions.

Farm Input Suppliers

Inputs are the pre-requisites for proper growth and development of agricultural commodities. Input means the action of putting something into something to achieve the desired objectives. Proper production needs proper criteria to be fulfilled. Inputs list all those requirements and their possible vendors with their rate.

Farm Output Suppliers

The farm outputs/products are the amount of something that a farmer, his/her group/cooperative produces, such as food grains, vegetables, fruits, spices, seeds, etc. Proper product needs proper quality & quantity in time. Products list, their possible vendors with their rate are marketing information useful to both sellers & buyers.

Marketing of Inputs & Outputs

Marketing, the process by which a product or service originates and is then priced, promoted, and distributed to consumers. In large markets the major marketing functions precede the makeup of products. They involve market research, planning, programming, product improvement, grading, and supply as per demand. Marketing concentrates primarily on the buyers, or consumers. After determining the customers'

needs, marketers develop strategies that are designed to educate customers about a product's most important features, influence them to buy it, and then to enhance their satisfaction with the purchase. Where marketing once stopped with the sale, today businesses believe that it is more profitable to sell to existing customers than to new ones. As a result, marketing now also involves finding ways to turn one-time purchasers into lifelong customers which basically depends on quality & price of inputs and products.

Marketing includes planning, organizing, directing, and controlling the decision-making regarding product ranks, pricing, advertising, and examining. In most of these areas marketing has overall authority; in others, as in product-line development, its function is primarily advisory. In addition, the marketing unit of a business firm is responsible for the physical distribution of the products, determining the channels of distribution that will be used, and supervising the profitable flow of products from the farm or storehouse.

Tailoring the Product

A commodity that is generally similar in manner or design, but may vary in such elements as size, price, and quality is collectively known as a product line. Price is an important element of any product position. Most marketers believe that product lines must be closely related with consumer needs and wants.

Farms tend to change product items and lines after a period of time to gain a competitive advantage, to respond to changes in the economic climate, or to increase sales by encouraging consumers to buy a new value added model. For example, if the economy weakens, a produce might use cheaper inputs to make a product more affordable. Sometimes, however, producers will alter the technique (early, late, offseason, etc) rather than the quality of the item. The practice of changing the appearance of goods or introducing inferior parts or poor workmanship in order to motivate consumers to replace products is known as planned obsolescence. Some people object that this practice leads to waste or can be unethical. Producers reply that consumers are conditioned to expect such changes and welcome the variety they offer, or they deny

that poor quality was intentional.

The popularity of almost all products eventually declines in certain time period. In fact, few successful products struggle ahead through what is called a product life cycle, which describes the course of a product's sales from its introduction and growth through maturity and decline in all stages prices levels remains fluctuating. Some fad products market decline in a very short period. Because products are always aging and sales of even the most successful products eventually decline, farms must continually develop and introduce new items. For this invest in product research and consumer testing is essential. The high failure rate influences the pricing of products because profits from these products depend on costs of products & situation developed.

Promoting the Product

Advertising, personal (face-to-face) or direct selling, sales promotion, and relationship building are the primary methods that farms & respective suppliers use to promote their products. In case of farm products transaction in Nepal, advertising has not been found effective in practice but, may be in future.

Advertising the Products

Advertising is used to make consumers aware of a product's special low price or its quality benefits. But an even more important function of advertising is to create an image that consumers associate with a product, known as the brand image. The brand image goes far beyond the functional characteristics of the product. For example, a Junar's juice of Sindhuli, Marpha Brandy of Mustang, etc may have a particular taste that is one of its benefits. But when consumers think of it, they not only think of its taste, but they may also associate it with energy, extreme action, and original behavior. All of those meanings have been added to the product by advertising. Consumers frequently buy the product not only for its functional characteristics but also because they want to be identified with the image associated with the brand. Advertising plays an important role in promoting products and adding value to brands.

Selling the Products

Larger the volume, higher the quality & regular the products supply easier in selling the products at nominal prices. One village one product program has found effective to implement this concept. Seed products & general products prices differ that the prices for former are higher than the latter.

Where extension reaches a mass audience, personal or direct selling focuses on one customer at a time. That kind of individual attention makes direct selling expensive, but it also makes it effective. As the costs of personal selling have risen, the utilization of salespeople has changed. Simple transactions are completed by clerks. Salespeople are used primarily where the products are complex and require detailed explanation, customized application, or careful negotiation over price and payment plan. But whether the sale involves seed or pesticides, personal selling involves much more than convincing the customer of the product's benefits. The salesperson helps the customer identify problems, works out a variety of solutions, assists the buyer in making decisions, and provides arrangements for long-term service. Influence is only part of the job. A much more important part is problem solving.

Today, the selling process of inputs has become much more complicated, most producers provide training for the sales force e.g. the liquid fertilizers selling in Nepal. A training program for new members of the sales force teaches them about such matters as producers' history, selling and presentation techniques, listening skills, the producers and use of the products, and the characteristics of both the industry and its customers.

With the increasing complexity of business problems and products, effective sales solutions often require more knowledge than any one person can master. As a result many producers & suppliers now use sales teams to service their largest and most problematical balance sheet, e.g. for fertilizers selling. Such teams might include personnel from sales, marketing, manufacturing, finance, and technical support.

Sales Promotion of Products

The purpose of sales promotion is to supplement and coordinate advertising and personal

selling; this has become increasingly important in marketing. While advertising helps build brand image and long-term value, sales promotion builds sales volume. Sales promotions are designed to persuade consumers to purchase immediately by providing special incentives such as cash rebates, prizes, extra product, or gifts. Promotions are an effective way to spur sales, but because they involve discount coupons and contests with valuable prizes, they are also expensive and so reduce profits at the same time prices may be nominal.

Marketing Relationship Building

In the past, most advertising and promotional efforts were developed to acquire new customers. But today, more and more advertising and promotional efforts are designed to retain current customers and to increase the amount of money they spend with the company. Consumers see so much advertising that they have learned to ignore much of it because the advertising really adds the prices. As a result, it has become more difficult to attract new customers. Servicing customers beyond advertising, however, is less expensive means lower price. As per the respondents, in fact, acquiring a new customer costs about five to eight times as much as keeping an existing one because of bargaining & attraction policy incentives.

To retain current customers, some develop faithfulness programs such as the transportation bonus used by many suppliers. A marketer may also seek to retain customers by learning a customer's individual interests and then tailoring services to meet them. Such programs help companies retain customers not only by providing a useful service, but also by making customers feel appreciated. This is known as relationship building.

Product Distribution

Some products are marketed most effectively by direct sale from producer/manufacturer to consumer. Among these are durable equipment such as farm tools, equipments & machineries. Many types of such goods now use direct mail catalogs or

have a presence on the World Wide Web. Because many people are extremely busy, they may find it simpler to shop in their leisure hours at home by using catalogs or visiting Web sites. Comparison shopping is also made easier, because both catalogs and e-commerce sites generally contain extensive product information. For retailers, catalogs and the Web make it possible to do business far beyond their usual trading area and with a minimum of overhead.

The direct marketing of products such as household needs is very important. Television is a potent tool in direct marketing because it facilitates the demonstration of products in use. Direct sale of all kinds of goods to the public via home-shopping clubs broadcasting on cable television channels is gaining in popularity. Some companies also use telephone marketing, called telemarketing, a technique used in selling to businesses as well as to consumers. Most consumer products, especially the farm outputs however, move from the producer/manufacturer through agents to wholesalers and then to retailers, ultimately reaching the consumer. Determining how products should move through wholesale and retail organizations is another major marketing decision.

Wholesalers distribute goods in large quantities & at nominal prices, usually to retailers, for resale. Some retail businesses have grown so large, however, that they have found it more profitable to bypass the wholesaler and deal directly with the producers or their agents. Wholesalers first responded to this trend by changing their operations to move goods more quickly to large retailers and at lower prices. Small retailers fought back through cooperative wholesaling, the voluntary banding together of independent retailers to market a product. The result has been a trend toward a much closer, interlocking relationship between wholesaler and independent retailer.

Retailing has undergone even more changes than wholesaling. Intensive pre-selling by producers/manufacturers and the development of minimum-service operations, such as self-service in department stores, has drastically changed the retailer's way of doing business. Supermarkets and discount stores have become commonplace not only

for groceries but for products as diversified as medicines and gardening equipment. More recently, storehouse retailing has become a major means of retailing higher-priced consumer goods such as fertilizer, tools and equipments. The emphasis is on generating store traffic, speeding up the transaction, and rapidly expanding the sales volume at lower prices. Chain stores groups of stores with one owner and cooperative groups have also multiplied. Special types of retailing, such as vending machines and convenience stores, have also developed to fill multiple needs.

Transporting and store-housing commodities are also technically feasible within the scope of marketing. Products are often moved several times as they go from producer to consumer. Products are carried by mules, carts, truck, helicopter & airplane also. Efficient management determines the best method and timetable of delivery for any particular product at nominal prices.

Agriculture Market Information

Commercial Agriculture Development Project (CADP) under the Ministry of Agriculture Development has initiated/established an Agriculture Market Information System (AMIS) to provide useful and effective price and market information particularly to the farmers and commercial stakeholders are the major objectives of market information dissemination. It provides commodity & date wise transaction volume. To achieve those objectives, the Project has been supporting at different levels for market information collection and dissemination through FM radio, daily and monthly bulletins and AMIS website of four major markets of Nepal – Birtamod, Dharan, Biratnagar and Kalimati. It has also compiled daily price information and records of monthly historical price information which are being used by the policy maker, researcher and in-house specialists for different purposes. Similarly, different capacity development trainings have been conducted relating to AMIS for Project beneficiaries - farmers, traders and processors and also Project stakeholders - District Agriculture Development Office (DADO), partner NGOs and CAA. Besides, the Project has also established AMIS desk at Eastern Regional Agriculture Development Office at Biratnagar to institutionalize the AMIS and networking with DADOs. Besides, the Project's AMIS has established network with CAA branch, CAA member, semi

commercial and subsistence stakeholders groups for collection and dissemination of information regularly. Similarly, Project has established group cooperative based market information system (GMIS) at the group and cooperative level and network them with the central information system and other market information service providers.

Forces Affecting Modern Marketing

Of all the forces affecting modern marketing, perhaps none is more important than globalization. Since the 1980s, technological advances such as global telephone and computer networks have reduced geographic and even cultural distance. As a result, companies can now buy supplies and produce and sell goods in countries far from their home offices. Products conceived in one country are now being produced and then sold in many others. For example, radish seed (Japan), maize seed (India), Cabbage seed (Korea), etc have become household words around the world.

Although being able to market goods far from producers with many new opportunities, it also means they face new competition. Local producers are tackling international competition. Some economists argue that local companies should be protected from such competition through legislation that regulates the flow of goods through trade barriers and other measures. Others oppose such regulation, arguing that it only raises prices for consumers.

Globalization, however, is only one force changing the way companies market their products or services. Another involves changes in the very interests and desires of consumers themselves. Consumers today are more sophisticated than those of past generations. They attend school for a much longer period of time; they are exposed to newspapers, magazines, motion pictures, radio, television, and travel; and they have much greater interaction with other people. Their demands are more exacting, and their taste changes more volatile. Markets tend to be segmented as each group calls for products suited to its particular tastes. “Positioning” the product—that is, determining the exact segment of the population that is likely to buy a product and then developing a marketing campaign to enhance the product’s image to fit that particular segment—

requires great care and planning. This type of campaign is known as target marketing.

Competition also has increased, as the number of commercial producers engaged in producing similar products. Each producer tries to differentiate their products from those of its competitors. Profit margins, meaning the profit percentages made by selling per unit of sales, are narrowed. Although costs continue to rise, competition tends to keep prices down. The result is a narrowing spread between costs and selling prices. An increase in a sales volume is necessary to maintain or raise profit.

Another force affecting modern marketing is the influence of the consumer rights or consumer protection movement. This movement insists on safe, reputable, and reliable products e.g Dhara edible oil before & after inspection, poultry meat during bird flu suspicion. Likewise the heavy pesticide use, its effect in environment & human health also affect in marketing the farm products. Even the producers handle themselves in public life that is how it reacts to social and political issues. The public's dissatisfaction with the actions and attitudes of a producer has sometimes led to a reduction in sales; conversely, consumer enthusiasm, generated by a producer's intentional establishment of a good public image or public relations, has led to increased sales on high, medium or low prices level.

Marketing Profession

As marketing has become increasingly more complex, a need has arisen for professional marketers trained in the social sciences that also possess statistical, mathematical, and computer backgrounds. Many wholesalers now have feeling the need of training programs designed to train wholesaler marketing executives for data keeping, advertising, administrative & financial management, production suggestion, human relations, retailing, and personnel administration also.

In recent years, unorganized Nepalese farmers have been weakened because of increasing competition of farm products in one side & the Agriculture Inputs Company Private Limited's policy to distribute fertilizers only in reference to the selected cooperatives. Farmers (FGs & FCs) are also becoming aware for generating

profitable sales volume. Thus, their decision-making is being enhancing. This trend gives indication of the foreseeable future.

Marketing Research

This study is concerned with the farm inputs & outputs marketing prices data. Marketing research is a pivotal part of the marketing process. By referring to studies of prospective buyers' needs, wants, and tastes, providers of goods and services can modify their marketing programs. The results of marketing studies suggest to sellers not only what they should sell or provide but also where to offer particular goods and services, how to promote them, and how to set prices.

Marketing research helps businesses identify consumer needs and wants so a producer/company can develop and promote products more successfully. Such research also provides the information upon which important advertising and marketing decisions are based.

The insights generated by a focus group are often explored further through quantitative research, which provides reliable, hard statistics. This type of research uses closed-ended questions, enabling the researcher to determine the exact percentage of people who answered yes or no to a question or who selected answer a, b, c, or d on a questionnaire. One of the most common quantitative research techniques is the survey in which researchers sample the opinions of a large group of people. If the sample group is large enough and is representative of a particular group, such as executives who use cell phones, statisticians consider the findings statistically valid, which means that if all consumers in that particular category could be surveyed, the findings would still be the same. This means that quantitative findings are conclusive in a way that qualitative findings cannot be.

Production Cost & Price

This study has qualitatively concluded as per the responses that there is inverse relation between price of farm products and production cost. It has supported to emphasize in maintaining the inputs price & timely management of the products.

As per the respondents, production functions has to be transformed by increasing land use efficiency, labor use efficiency, irrigation efficiency, capital, other inputs and organizational efficiency by adopting appropriate modernization in agriculture to reduce the production cost & increase production volume to have the better prices. In essence the relation between cost of production & price has been found inverse order ie. Normally higher the production cost lower may be the outputs prices & gross profit. At this moment, our focus need to go in minimizing the production cost in a way that help & give attention to maximize the outputs price & profit in sustainable manner.

Some miscellaneous points have been noted hereunder as an essence internalized during the study period, which resemble the reality of the country to some extent.

Knowledge & practices in improving Productivity

- Best use of factor of production
- High yielding technology
- Value chain
- Comparative advantage and
- Competitive advantage

Way forward for agricultural transformation

- Integration of small holders in the value chain
- Higher growth through small commercial farmers
- Development of rural non-farm sector by narrowing the gap between urban and rural areas
- Promote rural infrastructures & rural entrepreneurs
- Identify and focus program on high potential areas
- Allocation of adequate national budget in agriculture
- Broad-based and inclusive agriculture growth

Major priority areas for agriculture development

- Research, extension and education
- Need to separate finance institutions for agriculture
- Systematize the farming organizations
- Institutional innovation
- Irrigation, fertilizer, manure, seed and other inputs management
- Policy reform to promote public sector investment in agro-industries
- Price stabilizing tools & techniques
- Documentation & data based planning, supervision & monitoring

Recommendations

Considering the above mentioned discussions & findings & summary-conclusions, brief suggestions has been forwarded hereunder with positive motive & techno-managerial viewing.

Farm level:

- Strong supervision & controlling mechanism for costly hybrids variety seeds so as to protect farmers from undergoing unexpected larger losses as in maize production in central terai especially at Bara & Parsa.
- Training to real beneficiaries to provide knowledge & skills in using cost effective inputs, efficient and sustainable tools, equipment & machineries and environment friendly good farming technologies aiming to increase profit margin.
- Encourage farmers & entrepreneurs in using inputs under the available policy incentives in seeds, fertilizers, farming tools, equipments & machineries purchasing, marketing supports & energy use subsidies for farming.
- Promote farmers to recover labor scarcity by adopting suitable tools, equipments & machineries to minimize production cost & increase profit margin.
- Ensure effective implementation of land use planning and management to

promote productive use of land, land leasing, and environmental protection.

District level:

- Verify the suitable seeds, fertilizers & efficient agro-implements by land type (terai, flat land, gentle/steep sloppy hill & mountain areas) and promote quality inputs mission allowing service provider incentives and seeds, fertilizers, tools, equipments & machineries and power (electricity) subsidies as mentioned in the Agriculture policy, Agriculture Business Promotion Policy, etc. Give emphasis to clean energy uses by coordinating beneficiaries (focusing farmers, FGs, FCs) the concerned line agencies related with agriculture mechanization.
- Address the increasing trend of volumetric production/supply, regular supply & quality inputs/products involving educated youths in commercialization & modernization in agriculture by planning appropriately for producers & supply concerned agencies. Educate the grass root farmers focusing inputs/outputs data keeping which may be used in increasing profit at minimum cost. Facilitate farmers in purchasing appropriate quality inputs including efficient farming tools, equipments & machineries. Share the farm level inputs/outputs problems & potentials & transfer to concerned higher authorities including research institutions.
- Ensure input availability & outputs supply that the input/outputs supply and distribution system provide timely, quality, and reasonably priced inputs to farmers.
- Marketing and sales orientation/training to Community Business Facilitator and implementator which assist in managing the marketing function with appropriate recordings.
- Smallholder farmers' capacity build up for efficient production and effective market access by adopting inclusive and pro-poor value chain development for providing economic opportunities to smallholder producers which may increase the prices of products also.

Regional level:

- Prepare the capable human resources at regional level by adopting "Training for farm inputs-outputs prices data keeping". Coordinate between the line agencies (with emphasis to research-extension-farmer-traders), monitoring & supervision of the DADOs, FGs, FCs and unorganized progressive farmers also. Update inputs/outputs prices data & facts on private & group ownership basis. Highlight the successful cases regarding price changes through documentation, media use, etc. Encourage the farmers & their organizations in using quality inputs for farming including tools, equipments & machineries for better/cost effective outputs.
- Increase investment to provide a favorable environment and specific measures to increase the level and effectiveness of public and private investment including investment in infrastructure and irrigation

Department & Ministry level:

- Ensure technology development and dissemination that is demand-driven and responsive to farmers and enterprises needs.
- Promote market development and commercialization to achieve the growth potential of Nepalese agriculture driven by expanding domestic and regional demand, emergence of innovative and competitive enterprises, and increased value addition.
- Make the MRSP resourceful in many ways. Likely, make the whole sale & retail agriculture markets, capable in meaningful recording by documentation of farm inputs/ outputs prices & researches to solve the emerging issues related to farmers.
- Encourage in using verified farm mechanization technologies in terai and flat lands by campaigning as agro-mechanization mission through service provider incentives and subsidy on machines & farm operation power as per

the available policy provision.

- Inter-ministerial harmonization for stabilizing the inputs/outputs prices is needed.
- Adopt functional supervision & monitoring of farm inputs/outputs for farmers benefits & protecting them from undergoing production losses.
- Adopt cost effective advertising/information mechanism for specific inputs & farm products aiming to promote farming profession & agriculture marketing function. Market regulation guideline has to be revised to address the current issues.
- An accidental loss of human resources & infrastructures in some agri-market has needs timely supports from the government & to perform the marketing functions well in favor of the consumer & also seller adequate alternative space is required in the densely populated urban cities.
- Improve policy to enable smallholder's agriculture markets in the country which resemble the huge masses of Nepalese farmers & facilitate them in recording inputs outputs related data.

Policy options

On the basis of sector assessment and vision, various policy options have to be identified. Each policy options need to include actions, investment, implementation agents and modalities, inputs, outputs, and outcomes, beneficiaries, time & locations. Analysis of pros and cons of each option is essential.

- Policy incentives has to be provisioned & implemented for inputs price stability & subsidy, outputs price optimization, skill development, attitudes reformation, science and tech development & modernization in agriculture for poverty alleviation & food security.

- Minimum support price & crop insurance policy provision and its application accountably may encourage farmers & entrepreneurs to plan and invest for commercialization and modernization in agriculture sector.
- Likewise, functional policy formulation & implementation for land improvement & making larger size of farms (merging small parcels with better alternatives) aiming to promote mechanization practices so as to reduce crop production cost, increase profit, decrease per unit prices of inputs & recover the increasing human labor scarcity in Nepalese agriculture sector.

Scope for Further Study

Considering the above discussions and findings of the study, it is suggested that it would be useful to undertake the following further research projects:

- Scope for further study on farm inputs-outputs prices (IOP) including agricultural tools, equipments & machineries trading performance & review of farm inputs subsidy practices in Nepal, its potentials and gap.
- Scope for the quantitative analysis on the inputs prices changes & its influences in outputs by reducing crop production cost (in different categories of crops & in a period of years).
- Relation study between farm inputs prices & crop outputs potentials with emphasis to prices.
- Scope of further study on feasibility of environment friendly good agricultural practices, its inputs prices & outputs/products prices problems & potentials in the country.

18. PRODUCTION AND MARKET SURVEY OF APPLE IN MUSTANG AND JUMLA, 2012

Conclusion

Apple fruit have positive economic implication to the Nepalese farms. It shares major portion of their household economy of the commercially growing farmers in high hills of Nepal. The costs incurred in production are produce in higher and provide year round employment opportunities. At the same time government crops emphasized to produce/cultivate apple in highhills of Nepal. However, the post production activities the focus on are lacking or immature from government side. Investments from private sector have not getting upward direction as it was anticipated by APP.

As a result of high demand and the government's emphasis on the apple promoting activities, both the marginal as well as the fertile fields covered by other crops have been converted into apple orchard in the high-hills of Nepal. Nevertheless, the expected rate of growth in terms of area and production has not yet been achieved. This is an outstanding issue often associated with several problems, as for example, inconsistency in internal as well as external demand and lack of co-ordination between production and marketing. Despite the fact that apple is a viable option to increase farm income and hence alleviate widespread poverty considerable attention has not been given for its production as well a marketing aspects.

The average density of apple was found slightly higher than national recommended density (415 trees/ha) and the farmer of study area was found to using sapling and seedlings both for planting materials which is moderately higher then the national average. The majority of the apple trees under study were found bearing and the productivity was found higher than national average.

The gross margin analysis showed that most of the farmers realized profit from the apple cultivation. It is empirical that apple based farming systems is more profitable land use approach in the high hills of Nepal as compared to annual crop based systems could bring substantial improvement in income of farm households in the high hill

regions where farm size is very small and barely enough to sustain farm family from annual crops.

Traditional packaging materials like bamboo baskets (*Dokos*) are used for packing. Bamboo baskets sometime have sharp edges. Gunny bags (*Bora*) and the card board boxes are also used as packaging materials or containers. Over weight and over packed packages are transported in mules, tractors or on the roof of night buses. The modes of transportation are porters, mules, horses, yaks and goats. Many a time these packages filled with fruits are dropped or thrown while loading and unloading. Roads are rough and bumpy. Fruits are damaged to great extent during transportation. Fruits are stored in rooms without windows or ventilation. Unsuitable storage conditions damage fruits further. Improvements in harvesting techniques, storage conditions, handling techniques during transportation, packaging, modes of transport and marketing conditions are needed to reduce post-harvest losses in apple fruit. This clearly indicates that the post-harvest losses happen due to poor marketing condition in developing countries.

With the commercialization of agriculture, disposal of the produce has become as important as the adoption of new farm practices. It is recognized that better and more stable prices alone can sustain the increased intensity of input use on the farms to increase production. The journey of each product from farm to the ultimate consumer plays a crucial role in determining the price to the farmers. Unless marketing improves, no incentive to increase production will attract the cultivators. This is more important in case of fruits which needed more cost to store for long periods due to their perishability and quality deterioration while storage. In their case, the speed as well as efficiency of marketing operations is crucial in determining profits of the product on the one hand, the level of satisfaction of the consumer, on the other. The majority of the farmers are not satisfied with the Farmgate price which they are fetching. In an average, the farmers are positive with Farmgate price which they are fetching.

As the farmers are not well equipped by adequate infrastructure, there is potentiality of seasonal export of apples to our neighboring district headquarters and major big markets and neighboring country in South Asia and Middle East. The quality of apple of Nepal

has been ranked better ones, so there is scope in exporting. Recently, larger traders are exploring the opportunities of apple fruit exporting basically apple in Arabian countries.

Production centers are scattered and are considerably far from major consumption centers. High cost of production is resulting from high price of inputs, small scale and scattered pattern of production. Packages of appropriate production technology are totally lacking. Actually there is lack of coordinated research and extension in the field of post-harvest aspect of apple. Distribution system is weak due to lack of agricultural road, transport and communication facilities. Similarly, there is lack of appropriate variety to prolong harvesting seasons. Fruit are available in good supply for a short period during the main production season, while it is becoming scarce during out of season. Likewise, lack of sufficient storage facilities: Availability of facilities will enhance the production and productivity of the farms.

Recommendation

Area Expansion

- Scattered production of apple should be consolidated by developing commercial production pockets and providing both the production and post-harvest technology to the farmers.
- Lease holding of government unutilized areas should be granted to interested public, private and cooperative groups which has high potentials as per the favorable micro climate for apple production on long term basis on soft charges and provisions are to be made in policy formation in this regard.
- Investments in infrastructures like small and large irrigation canals as per the need of the area should be made from the government agencies.
- Rural agriculture roads and feeder roads should be constructed as per the demand of the pocket areas of apple.
- Input distribution system is weak due to lack of agricultural road, transport

and communication facilities, so governmental investments on these sectors are highly recommended.

- Training for appropriate production packages like training on nursery establishment and rearing, quality sapling production, plantation should be done in a coordinated way through stakeholders like DADO, NGO's and INGO's mobilizing the groups and cooperatives.
- Research on production should be accorded a high priority. Significant research on specific production oriented problems should be under taken by creating capable and highly trained manpower, allocating significant budget and building infrastructures.
- Subsidy on sapling from DADO and DSCO (District Soil Conservation Office) should be continued for areas expansion and supply of quality saplings supply in prominent areas.
- Policy regarding provision of soft and long term production loans should catered from associated agencies like Agriculture Development Banks to enhance production and area expansion of apple farms and farming communities.

Production and Productivity

- Appropriate location specific production packages should be developed as per the need of the farmers in consistent utilizing local resources, manpower from the NARC with the collaborative efforts of extension through DADO and other agencies like local NGO's and cooperatives.
- Production packages should be tied up with the necessary infrastructures like agriculture roads, irrigation facilities, mobilization of required inputs and technological packages for optimum utilization of such constructed hardwires.
- Training and extension of appropriate technologies (training, pruning, fertilizers application, growth regulators use, and disease pest management)

should be provided to the producers to enhance production and productivity giving a prime emphasis on proper care and management of the apple farms through DADO and other stakeholders.

- Intercropping of legume crops should be promoted in the farm level as it helps to promote the nitrogen level of the soil however, the intercropping of cereal crops maize and millet should be limited as it competes for the nutrients in the farm by the training and extension of concerned line agencies.
- Provisions of short term soft loans for farm operation should be made through group saving and cooperatives.

Quality and Quantity Enhancement

- Training programs like application of manures and fertilizers, irrigation, training pruning should be designed to enhance the quality and quantity of produce.
- Extension programs to meet the quality and quantity of the desired market to maximize the net returns to the farmers like proper harvesting techniques, picking up the produce in right time without effecting the productivity in the next year is prominent and the action plans from the extension agencies are to made.
- The DAPA should be mobilized within the district to promote the quality and quantity of apple as per the demand of the local and prominent market centers.

Post-Harvest Management

- Post-harvest appropriate technological approaches should be designed as per the farmers' need and conditions right from the picking till marketing should be designed, including grading, packaging and storage in coordination of DAPA.
- Provisions for the necessary things like picking tools like secateurs, ladders, weighing balances and plastic crates for handling should be made through line

agencies in subsidies to the farmers groups and cooperatives.

- Short term handling loans should be directed as seed money to farmers groups for post harvest through group savings and cooperatives.
- Transportation and proper handling techniques right from the farm to the storage structures should be developed and introduced as per the location specific packages through the concerned extension agencies working for apple.
- Picking in right time for the good market potential, storage and handling should be taken to the farming community in an aggressive form as the farmers' don't pick their product till falgun which helps them to achieve higher price in the current year however it hampers production in the following year.

Storage

- Appropriate storage facilities are to be constructed by selecting suitable location giving due emphasis on production and road access.
- Investments are to be directed to the apple growing potential areas with low investment and high returns technologies by establishing Cellar Storages in coordinated way of concerned line agencies with the consultation of DAPA.
- Storage should be directed and determined by the demand and supply giving due emphasis on achieving higher net returns to the producer farmers, groups and cooperatives.
- Appropriate tools like crates, racks to fit in the product in good proper manner for the longevity of the stored apple should be designed and provide to the stakeholders in subsidized rate.

Marketing

- Local market hubs and marketing infrastructure like haat bazzars, collection centers and agriculture markets should be established in coordination with the

Agribusiness Promotion and Market Development Directorate, local FNCCI and DAPA.

- Packaging of the apple produce is not done properly with proper container, so more losses occur due to damage. Appropriate environment friendly packaging materials like straws should be designed utilizing local resources.
- Coordinated efforts should be made to channelize the farmers and market intermediaries through DAPA to achieve higher returns to the producer farmers.
- Adaptive research that responds to market requirements need to be emphasized and awareness in this regards to the farmers should be taken in a campaign.
- Packaging, transportation, marketing system and should be developed as well.
- Programs like Apple festival (Mahotsab) which was done in Mustang district last year should be replicated in prominent apple producing districts to promote agrotourism and local product giving an immediate returns to the participating farmers and advertizing their products nationwide in coordination with local FNCCI and DADO.
- Transportation subsidy on marketing of apple should be provided to the farmers to take their production from production areas to the prominent markets as in Jumla district.
- Abolition of the levies in districts should be avoided in coordination with DCIPA, DADO and DDC.
- Lead producer farmers and associated cooperatives group leaders should be trained on the simple accounting, marketing and trading packages with coordination with Division Cooperative Office and DADO.
- Horizontal and vertical linkages between and amongst the production, marketing and processing industry and integration between and them and the institutions with fruitful activities are in dearth need enhance the value chain

and to fetch higher returns by establishing small scale local industries.

Export and Import Substitution

- Central and national level committees of DAPA should be promoted for export promotion and import substitution and plans are to be made in the concerned areas for raising production, productivity, marketing to achieve greater returns.
- Government should facilitate the products giving subsidies to exporting farmers in the areas like transportation and phytosanitization cost of the exporting countries in coordination with the Plant Quarantine of the nation and the concerned country.
- The demand of quality and quantity of the apple to be exported as per the prominent countries like Bangladesh and Middle Eastern Arab countries should be accessed and a high level commission should be made in coordination with FNCCI and Agro Enterprise Center and other countries as well which we have comparative advantage in production of fresh apple product.

Policy Implications

- With a view to develop the apple growing areas of the regions simultaneously, efforts should be made to induce hill farmers to take up the cultivation of apple as an in commercial manner to supplement their income. There is an ample opportunity of increasing area under apple, which ultimately supports to increase farm income and reduction in poverty.
- Development and introduction of appropriate technology has become very rapid due to a continuous flow of research and experimentation results. In this regard, to obtain the best results, the apple growers should be delivered with improved and location specific package developed by research through strong extension system.
- Similarly, emphasis should be given to the economics of profitability in apple

production, pre-dominating the optimum crop plan so that the area should be shifted from less profitable crops to more profitable in the existing crop plan. Therefore, the specialization in apple production helps in its farm income increment.

- Since most of the farmers are presently away from commercial based agriculture economy and grow mainly subsistence crops like food grain, the general price policy may not initially be practical for efficient farm level changes. The non-price economic incentives along with emphasis on optimal crop planning through extension education could constitute the more promising policy measures at the initial stage to achieve the desirable changes in the farm plan.
- Difficult access from farms to markets is yet another factor inhibiting the remunerative scale of apple production and sales other than high value ones. So, the farm income could be increased both by apple by developing optimum level of processing units.
- The apple cultivation has positively help to increase greenery and check the soil erosion because of its deep-rooted system. The soil erosion has been non-stop phenomena aggravated by floods and landslides. In this scenario, agro-horti system of farming specially apple based may enrich the farmers' economic status as well as it may improve quality of land ultimately saving an environment.

19. PRICE ESCALATION ALONG THE VALUE ADDITION ON PADDY, 2013

Executive Summary

Maintained hypothesis is that middlemen grab much of the benefits from agricultural products paying low to the farmers and charging high to the consumers thereby discouraging the farmers to produce and the consumers to consume. A widening of the marketing margin for rice could potentially discourage production and consumption making it a genuine concern for policy analyst. This market behavior is regarded as the narrowest bottle-neck in agricultural development and market expansion in the country, but at the same time we cannot ignore the contribution of the middlemen in the value addition to agricultural products. This study taking rice as a case, analyzes the price spread along with the value addition in rice. The main objective was to assess rice productivity, rice recovery percentage and price spread in the rice marketing from Farmgate to the retail. Primary data were collected from surveys of randomly selected 50 farm households and 41 mills from purposively selected 19 districts representing different development regions and ecological zones of the country. The marketing system for rice was purely private based except the distribution of small proportion milled rice by Nepal Food Corporation. The recovery percentage was found 66.2% for head rice excluding 3.8% broken rice. Brown rice recovery from huller mills was found much higher (73.2%). Rice recovery percentage might get influenced by drying of grain, storage facilities, varieties, mill operators' skill, milling process, and mill types. Average Farmgate price of paddy was found to be Rs 20.72 per kg for coarse and 24.29 per kg for medium paddy, while the retail price of milled rice were Rs 35.77 and 43.50 per kg for coarse and medium, respectively.

Policies are necessary for making marketing services such as transportation and milling more efficient especially from farm to retail market level that will help to reduce marketing margin. Encouraging the formation of farmers' cooperatives and establishment of relevant and regular market information to farmers can reduce the involvement of traders such as middlemen and assemblers who exercised more market

power to determine the price of paddy. Market information matches rice supply with the demand and stabilize its price for the benefit of both consumers and producers. Formation of farmers' cooperative, reduction in the transportation cost, improving the market information system, and improving the role of farmer in price determination helps to reduce the marketing margin on paddy.

If the farmer's have storage facilities, they can retain the paddy during the harvesting season to sell at higher price at the time of shortage. Government need support programs to facilitate storage facilities and the provision of interest subsidy and loan repayment system throughout the year. This can help the farmers to supply their products at the time of shortage at higher prices compared to the price at the harvesting time. Stocks play a key role in equilibrating markets and smoothing price variations. In addition a clear distinction between providing a buffer against shocks to the rice market and embarking on a hoarding strategy must be clearly defined in order to reduce impacts from external price shocks.

Minimum Support price can assure the farmers if declared before the sowing season so that the farmers be able to prepare a good plan for good harvest. If the farmer has secure market through government sector, they will produce more. In case the price of paddy goes below the minimum support price fixed by government, then the government should be ready to purchase the paddy at minimum support price. This can be done through different agencies like Nepal food cooperation or other. Government intervention at the time of low price helps to minimize the marketing margin and benefits both the producers and consumers with reasonable price. **Key words** : Rice, Price Spread, Milling Recovery, Value addition

20. MARKET FLOW AND PRICE SPREAD OF AGRICULTURAL PRODUCE IN MAJOR AGRICULTURAL WHOLESALE MARKETS OF NEPAL, 2014

Executive Summary

Assured and effective market management system would be boon to promote agriculture trade and enterprise promotion as well contributes to the national economy by grabbing the world market opportunities in Nepal. This project is designed to get information about the market flow and status of fruits and vegetables marketing at central as well as district wholesale markets of Nepal. Information on highly export potential but low supply products is also essential to get more prices. Seven wholesale markets situated in different districts like Sunsari, Rupandehi, Banke, Dhanusa, Surkhet, Kathmandu and Kaski districts were selected purposively. Primary data obtained from field and market observation, and market surveys were analyzed quantitatively. Simple statistics like sum, mean, percentage, weighted average and standard deviation were used for descriptive analysis of agricultural production, market flow of fruits and vegetables and prices of commodities.

There are 1350 different types of market centres developed in Nepal upto in 2013. There are 22 wholesale markets, 249 collection centres, 889 hat bazaars and 190 retail markets developed in different districts of Nepal with the financial support of Agribusiness Promotion and Market Development Directorate (ABPMDD).

The Kalimati Fruits and Vegetables Market is one of the pioneer organized terminals of fruits and vegetables wholesale market in Nepal where retailers, institutional consumers and other bulk consumer procure their supplies of commodities. An annual transaction of Kalimati market was found 235089 mt, 196454 mt and 200010 mt in 2011, 2012 and 2013 respectively. It was found that 71% of the total quantity sold from Kalimati was collected from 21 districts of Nepal. Among these districts, Dhading, Kavre, Makwanpur and Chitwan districts supplied more quantity respectively. These four districts covered around 45% of total supply to Kalimati Market. Dhading

supplied around 18% of Nepalese contribution in 2013. The commodities supplied from India, china and Bhutan was found 25%, 2% and 2% respectively. The average wholesale price (Rs 70.60) of those amount valued NRs 16,59,72,83,400. Potato, Onion, tomato, and orange covered the highest percentage collected and sold from the Kalimati Market. All these three vegetable items imported more from India compared to Nepal.

Dec/Jan is the month of highest transactions in 2011, Apr/May in 2012 and May/June in 2013. Highest amount of fruits and vegetables marketed in 2013 compared to 2011 and 2012. Oct/Nov is the month of lowest fruits and vegetables marketing in three years and Dec/Jan is the month of highest marketing. Price of each commodity was increasing each year. Price of tomato big was found higher in 2013 compared to 2011 and 2012 (Max. Rs 100 compared to Rs 70 per Kg). Just opposite of this, tomato small has higher price in 2011 and decreased in 2012 and 2013. The major problems and constraints observed are inadequate market space, lack of repair and maintenance of market infrastructures like market sheds, roads and drainage system.

Total amount of fruits and vegetables marketed in Dharan bazaar, Sunsari district was found 69582.50 mt in 2013/14. Potato, Cabbage, Ginger, Orange and Radish are marketed in highest amount. The highest amount of potato (10911 mt) is marketed from Dharan bazaar because Potato has multiple uses. There are few commodities which are supplied cent percent from national source. They are cauliflower, cabbage, Radish, Ginger, Turmeric, Litchi, green leaves, pulses, majito, watermelon, Ritha, Amriso and pear. Eighty percent of tomato supplied from national source while 20 percent is imported from India. Ninty five percent of onion imported from India. Cent percent of grapes and pomegranate imported from India. Sixty percent of Apple is imported China and forty percent is imported from India.

Ninty percent of the ginger and tejpat exported to India for consumption. Besides this, cardamom, Majito, Amriso and Ritha exported to India for consumption from Dharan market. Sixty five percent of marketed commodities from Dharan, Sunsari market were collected from Nepal and remaining 35% collected from international source. Among international source, India covered 80%. Among national source, Dhankuta

contributed the highest percentage (35%), sunsari (25%) and Bhojpur (13%).

Total amount of fruits and vegetables marketed from Kohalpur, Banke market was found 2627 mt excluding coconut and banana in 2013/14. Apples are collected from humla, Jumla, Mugu and other mountain districts while Mandarin orange are collected from Dailekh, Salyan, Rolpa, Rukhum and other hilly districts. Mango are collected and marketed from Banke, Dang, Kapilvastu, Bardiya and Surkhet also. Remaining Apples imported from India and China. Among vegetables, Tomato, Cauliflower and cabbage are the three major commodities marketed in highest amount from the market throughout the year 2012/13. Ginger and other fresh vegetables collected from salyan districts in large amount. Most of the vegetables and mandarin orange collected from Salyan district at Kohalpur market.

Total amount of fruits and vegetables marketed from Dhalkebar market was found 512906 mt in 2012/13. Mango are collected and marketed from Mahottra, Rautahat, Siraha, Saptari and Dhanusa also. Huge amount of mango supplied to Chitwan and Kathmandu. Among vegetables, Tomato, Cauliflower and Radish are the three major commodities marketed in highest amount from the market throughout the year 2012/13. Tomatoes and Radish are also supplied to Chitwan and Kathmandu for consumption (70%). Tarul, Oal, Jackfruit, pointed gourd and Turmeric and other fresh vegetables collected from nearby terai districts in large amount and supplied to Chitwan, Butwal, Kaski and Kathmandu for consumption. These four items supplied to Kathmandu in huge amount for consumption.

Total amount of different commodities marketed through Pokhara agricultural wholesale market was found 4480 Mt in 2012/13. Out of this, 25% of the commodities imported from India and China. Tomato big, apple, mango, Lime, Grapes and Potato white are the commodities which are imported more in amount to pokhara compared to domestic supply. Except Apple and Mango, other commodities are supplied from neighboring districts like Kaski, Shyanja, Tanahu, Gorkha, Gulmi, Palpa and Lamjung. Domestic source of apple consumed in pokhara was found from Mustang. The contribution of Shyanja is higher compared to other district to supply different commodities to Pokhara wholesale market. These commodities are also supplied to

Magdi, Mustang, baglung and Chitwan also.

Grape has higher price difference (92%) between retail and wholesale price compared to other commodities. Tomato big and small, Radish, Chinese long, Bitter gourd, bottle gourd, sponge gourd, Cucumber and Mango have higher price difference above 60%. Perishable commodities have no storage life and may have losses during transportation also. This difference makes consumer have to pay more for commodities. We have to think, this price spread is needed to certain limit or need to minimize to certain percent. Otherwise, farmers get low margin but consumer have to pay more and middle agent get more profit than farmers.

Total amount of fruits and vegetables marketed in Surkhet district was found 1193 Mt in 2013/14. Among them, 533 Mt of vegetables marketed in Surkhet from Dec to Apr in 2013/14. Total amount received from the marketing of fruits and vegetables was 6.2 million from four months. Carrot, Coconut, Guava, Grapes, Pineapple, Pomegranate, Lime and watermelon are the commodities imported from India cent percent and consumed at Surkhet. Most of the commodities imported from India, Rupandehi and Chitwan.

Major commodities marketed from Butwal market are imported from India. Few amount marketed from the market to neighboring hilly districts but major portion of fruits and vegetables stored at market and transferred to Chitwan and Kathmandu to get more price and profit. Therefore, butwal wholesale market is acting as transit market. Around 90% of Potato and Onion imported from India. About 30% of banana imported from India. Coconut, groundnut, pomegranate, Grapes, Sweet orange, and Pineapple are imported from India in cent percent. Madarin orange and Mango are collected from National source. Most of the Green leafy vegetables and other seasonal vegetables collected from neighbor hilly and Terai districts. Apple imported from both India and China. Garlic imported from China (90%) and only 10% of Garlic supplied from national source. Tomato, Ginger and Cauliflower consumed at Rupandehi districts and supplied to Kathmandu was collected from Palpa, Gulmi and Rupandehi.

21. STUDY ON COST OF PRODUCTION AND MARKETING OF FISH, 2014

Conclusion

Pond fish production has great potentials especially in Terai Regions and is one of the fast growing value chains in terms of production and market demands. Its expansion has tremendous scope in the Nepalese agriculture scenario. There is a wide range of fish species that can be reared it would be a great achievement if only domestic demand of fish can be reached by production through import substitution. The market size has also expanded substantially over the last couple of years especially due to high income groups, growth in urbanization and infrastructure development.

Fish had a major impetus in the transformation of subsistence production system market led production system. However there are immerging commercial growers in Terai belt with huge investments. With the increase in access investments and accessibility along with developed rural infrastructure the production sites are emerging rapidly in rural areas of Terai with small local markets linked with larger local and regional markets. The subsistence level fish production becomes less imperative and farmers have the opportunities to according change their production system. Despite these potential, the fish production is experiencing constraints and bottlenecks that were discussed in the previous sections. To address these problems value addition activities should be further introduced through all the stakeholders in a phase wise manner.

Recommendation

Based on the assessment and analysis of the findings especially the constraints faced by the actors of the fish production and marketing following major recommendation have been made.

Hatchling & Fry Production

Improvement in productivity and cost reduction should be the major intervention in fish value chain. Attention should be paid in improving the access to good quality

appropriate quantity and quality of hatchling and fry production combined with good price along with integrated disease and pest management, production infrastructure, storage, handling, packaging, transportation and etc. Some of the major innovations recommended for improvement of production system have been stated below.

Support Farmers in Hatchling & Fry Production

Availability of quality hatchling and fry combined with quantity as per the demand at reasonable price is the most pre-requisite in fish production. The DADO programs and projects should support the resource mobilization in establishing improved production and flow. Such system should address various aspects of hatchling and fry production with particular emphasis on:

- Improve the quality through the adoption of negative and positive selection.
- Establishment of production pocket areas in Terai areas for high quality fish production.
- Training and mobilization of hatcheries groups for the higher hatchling and fry production.
- Adoption of quality control mechanism.
- Explore the potential of other fish species in feasible areas.
- Raising awareness amongst farmers on need for quality and fish species through field demonstration, workshops, campaigns, farmers' field days and observation tours.
- Provide trainings for adoption of new technologies and practices for quality maintenance and to raise the quantity of production system.
- Replacement of old de-generated technologies and spreading of the new fish species that are profitable in nature that adopts with the prevailing production system.

Assist Farmers in the Selection and Adoption of Appropriate Species

Access to appropriate species is the key to boost the production and productivity and thus should facilitate the producers in identification and adoption of species to fully

harness the market opportunities.

- Study for the prominent fish species currently adopted by farmers in the district.
- Identify a pool of recommended fish species that are compatible with the market demand and requirements.
- Support farmers in the field testing and verification through farmer-led experimentation.
- Assist farmers in the diffusion of verified technologies and species through farmers' to farmers' technology diffusion practices.

The selection of the species should be done as per the market requirements of districts as well as the adjoining districts as well. As the Terai supplies the Hill markets, some of the fish growing areas should be especially oriented to Terai markets through species requirements and production timings as per the requirement of the Hilly fresh water fishes like Rainbow Trout.

Innovative tools like Participatory Species Selection (PSS) are recommended to enhance the adoption rate of the varieties and improvement of seed.

Promote Integrated Disease and Pest Management Practices

The incidence of disease and pest seems to be quite severe causing high losses. The losses are also due to deterioration of quality of management practices. The program in the collaboration with the Fish Development Directorate and Fish Research Program should support farmers in adopting integrated management practices. The problems that need immediate attention are:

- E.U.S disease management especially in low lying areas.
- Parasites like Trichodina.
- Insect pests like Argulus.
- Parasites like Cystod
- White spot disease
- Parasites like Dictylus.

The disease and pest management practice should also include the adoption of species resistant to prevailing diseases in the production areas. Priority should also receive the replacement of susceptible seed lot by higher generation seed.

Reduce Cost of Production

Program should assist fish growers in reducing their cost of production and achieve competitive and comparative advantage over the import substitution.

As discussed earlier the hatchling and fry management has the biggest impact on the cost followed by nutrient and disease management. Reduction in the cost of production can be achieved through:

- Adoption of appropriate species suitable to location specific conditions
- Use of quality hatchlings and fries with appropriate sizes.
- Adoption of improved production management practices.
- Mechanization of production operation like use of excavators for pond making, dike maintenance, inlet and outlet management for water.
- Development of rural infrastructure including farm to market link roads, collection points, temporary sheds for short term storage, grading and packaging etc.

Production Programs

Production programs should assist the farmers in competitive production with lower investments with technology transfer through District Agriculture Development Offices and Service Centers. The extension approach should be focused to all strata of farmers despite of the economic condition and approaches. The production can be raised by continuation of the following programs that is being conducted till now with more innovative and proactive thrusts.

- Programs like subsidy in tools and implements should be continued.
- Insurance programs on fish should be promoted with incentives should be continued.
- Water quality maintenance set should be on group basis.

- Continuation of distribution of Aerators and Plate Machines on subsidy.
- Subsidy on pump sets should be provided.
- Deepening the ponds and dike maintenance should be continued
- Feeding canal improvement programs should be promoted.
- Promotion of programs like Exit canal of water in case of flood should endorsed.
- Training on commercial intensive fish farming, hatchling and fry production
- Programs like Fish disease laboratory from Fish Training Centers should be continued
- Programs like surveillance reporting should be continued for disease and pests incidences

Marketing

The programs should work with the value chain actors in improving the efficiency of marketing. The capacity of the market functionaries at the current situation is not enough to cope with the increased supply from the Nepalese producers like if the production is doubled by any means, the supply market functionaries will not be in a position to absorb the increased supply especially at the current level of handling capacity of the market stakeholders. This is related to investment capacity of market stakeholders, market infrastructures like short term cold storage, cold storage, collection, grading, packing and transportation. At present some of the market function is being carried out by the Indian stakeholders and the import substitution is not possible only by eliminating the bottlenecks in production part, but it will also require to address the constraints in marketing part of the chain. Following major activities are recommended to remove those constraints:

Ensure Efficient Collection and Delivery System

The program should work with the producers to manage supply based on demand situation. The farmers should be facilitated in the preparation of Production Plan as per the market demand.

In the commercial production areas the producers will require facilities for the post

harvest operations like curing, grading and packaging.

Improved short term storage facilities are required in the collection points and wholesale markets. The current capacity of cold storage is very nominal and cannot support any increase in supply and this bottleneck has to be removed. The cost of cold storage is very high as compared to India and supportive programs should identify the ways to reduce the cost like lobbying for lower the electricity cost by government or seeking subsidy.

The capacity of collectors and traders should be enhanced in post harvest management practices. The approaches to facilitate for increased private sector investments in developing marketing infrastructures are needed.

Promote Institutional Development and Improve Marketing Chain

The majority of the production units are very small with poor investment capacity and the marketable volume of these units is also small. Such production units should be very susceptible to production and marketing problems and institutional development is necessary to provide such units for increasing efficiency. The different chain actors or market intermediaries possess different strength, expertise and comparative advantage over others for specific market function and the promoted institutional development must consider this fact. Marketing cooperatives should play a greater role in helping the farmers receive a greater portion of the benefits by increasing the efficiency of the cooperative marketing. Following improvement measures are recommended:

- Greater involvement and integration of hatchlings and fingerlings producers and fish producers in value chain operation:
- Promotion of marketing operations.
- Adoption of quality control mechanism.
- To analyze the strength, weakness, expertise and comparative advantage of the market functionaries.
- Strengthen the chain workshops can be organized with the active participation of the concerned functionaries.

APPENDICES

Appendix 1 : Average production cost and net profit of Paddy, Maize and Wheat

Year	Paddy			Maize			Wheat		
	Fixed_ Cost	Variab_ Cost	Total_ Cost	Fixed_ Cost	Variab_ Cost	Total_ Cost	Fixed_ Cost	Variab_ Cost	Total_ Cost
1993/94	256.08	12731.23	12987.32	205.20	7949.22	8154.42	215.96	9357.47	9573.44
1994/95	211.17	10471.84	10683.01	178.77	8703.13	8881.90	178.77	8703.13	8881.90
1996/97	224.06	16666.43	16890.48	224.14	13584.72	13808.86	224.14	13584.72	13808.86
1997/98	224.56	17196.17	17420.73	231.64	13297.56	13529.20	231.64	13297.56	13529.20
1998/99	172.58	18443.15	18615.72	309.53	12560.80	12870.33	309.53	12560.80	12870.33
1999/00	180.76	21356.34	21537.10	180.28	15618.17	15798.45	180.28	15618.17	15798.45
2000/01	182.50	24357.69	24540.19	174.79	16412.06	16586.85	174.79	16412.06	16586.85
2001/02	181.75	20291.79	20473.54	174.75	16198.53	16373.28	174.75	16198.53	16373.28
2002/03	181.47	25491.93	25673.40	172.81	22297.23	22470.04	172.81	22297.23	22470.04
2006/07	405.98	22304.57	22710.54	280.29	21221.90	21502.20	280.29	21221.90	21502.20
2008/09	355.82	26197.47	26553.29	273.72	22666.84	22940.56	273.72	22666.84	22940.56
2009/10	361.00	29695.89	30056.89	273.72	28776.55	29050.27	273.72	28776.55	29050.27
2010/11	250.60	36689.23	36939.83	273.72	26928.20	27201.92	273.72	26928.20	27201.92
2011/12	245.57	48834.04	49079.61	257.75	43713.03	43970.78	257.75	43713.03	43970.78
2012/13	237.17	59917.27	60154.44	235.86	51598.69	51834.54	235.86	51598.69	51834.54
2013/14	269.09	70863.25	71132.34	262.80	62805.29	63068.09	262.80	62805.29	63068.09

Appendix 2 : Average Gross Income from Paddy, Maize and Wheat

Year	Paddy	Maize	Wheat
1993/94	16156.96	8636.19	9586.17
1994/95	13890.28	9326.75	9590.73
1996/97	21087.85	14610.08	14690.45
1997/98	21377.68	13863.67	15833.10
1998/99	22616.28	18016.78	18588.79
1999/00	26124.11	19463.53	20742.34
2000/01	29092.58	19984.01	20723.14
2001/02	26458.65	20780.54	21704.61
2002/03	32595.88	25565.90	25089.67
2006/07	51230.02	27769.62	33794.34
2008/09	53109.19	33103.02	39465.53
2009/10	56707.13	36745.50	41607.18
2010/11	53435.35	36745.50	55452.20
2011/12	62543.24	53453.92	74501.96
2012/13	65566.25	54997.95	76059.60
2013/14	80722.70	67753.71	80938.92

Appendix 3 : Average Farmgate price of Paddy, Maize and Wheat

Year	Paddy	Maize	Wheat
1993/94	5.97	4.98	5.96
1994/95	5.92	5.79	6.13
1996/97	7.34	6.96	7.85
1997/98	7.78	7.04	7.94
1998/99	8.35	8.37	9.02
1999/00	8.98	9.02	9.67
2000/01	9.15	9.40	9.72
2001/02	9.32	9.68	9.82
2002/03	9.44	9.87	9.79
2006/07	10.16	9.40	10.72
2008/09	12.06	10.10	12.02
2009/10	12.33	10.54	12.27
2010/11	14.03	10.54	16.74
2011/12	15.81	15.45	23.01
2012/13	16.86	15.66	22.99
2013/14	19.91	16.37	21.08

Appendix 4 : Average Price of Chemical fertilizer

Year	DAP	Urea	Potash
1996/97	16.97	9.02	6.99
1997/98	17.52	8.13	7.63
1998/99	18.88	8.48	8.81
1999/00	20.13	12.93	13.23
2000/01	20.48	13.13	13.55
2001/02	19.99	14.45	14.33
2002/03	21.03	15.55	15.00
2006/07	27.86	25.43	15.80
2008/09	31.62	28.00	18.00
2009/10	31.31	28.00	18.00
2010/11	31.07	28.00	18.24
2011/12	31.16	28.08	18.19
2012/13	50.00	26.00	36.00
2013/14	48.00	22.00	34.00

Appendix 5 : Average Human labor wage rate

Year	Paddy	Maize	Wheat
1993/94	30.33	29.65	30.74
1994/95	30.67	34.19	30.16
1996/97	49.17	47.86	50.00
1997/98	50.00	48.57	50.56
1998/99	51.36	48.67	51.30
1999/00	62.07	63.80	62.59
2000/01	64.22	66.88	66.03
2001/02	73.44	71.25	70.86
2002/03	89.83	91.25	86.50
2006/07	97.62	96.47	90.94
2008/09	107.07	98.16	95.88
2009/10	114.14	102.89	106.94
2010/11	139.00	107.37	143.91
2011/12	212.97	203.50	223.85
2012/13	287.40	268.08	265.67
2013/14	339.68	352.00	344.04

Appendix 6 : Average production cost and net profit of Paddy, 1993/94

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			12731.2
Human Labour	Day	180.9	30.3	5487.0
Bullock labour	Day	39.0	39.9	1555.0
Tractor Use	Hour	7.2	145.6	1051.2
Pumpset Use	Hour	12.9	65.9	846.2
Threshern Use	Hour	3.0	80.0	240.0
Sprayer Use	Hour	5.0	30.0	150.0
Seed	K.G.	60.0	7.8	465.0
Organic Manure	K.G.	1875.2	0.2	434.6
Fertilizer	K.G.			
DAP	K.G.	81.7	11.0	902.8
Urea	K.G.	61.3	7.5	461.2
Potash	K.G.	24.2	8.6	209.1
Plant Protection Chemical used	Rs.			224.0
Others	Rs.			
Interest on Variable Cost	Rs.			705.2
Fixed Cost	Rs.			256.1
Land Tax	Rs.			64.1
Water Tax	Rs.			75.9
Deprection of Farm Equipments	Rs.			59.1
Repair and Maintence of Farm Equipment	Rs.			57.1
Total Cost	Rs.			12987.3
Gross Income	Rs.			16157.0
Main Product	K.G.	2097.1	6.0	12516.3
By-Product	K.G.	2350.0	1.5	3640.7
Gross profit at farm Gate	Rs.			3169.6
Production Cost per Quintal	Rs.			445.7
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			3756.9

Appendix 7 : Average production cost and net profit of Paddy, 1994/95

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			10471.8
Human Labour	Day	180.0	30.7	5519.5
Bullock labour	Day	39.1	40.1	1566.8
Tractor Use	Hour	1.9	220.0	415.6
Pumpset Use	Hour	7.3	165.0	1196.3
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	60.3	6.8	411.1
Organic Manure	K.G.	1496.6	0.4	531.3
Fertilizer	K.G.			
DAP	K.G.			
Urea	K.G.			
Potash	K.G.			
Plant Protection Chemical used	Rs.			152.9
Others	Rs.			
Interest on Variable Cost	Rs.			678.5
Fixed Cost	Rs.			211.2
Land Tax	Rs.			35.4
Water Tax	Rs.			59.0
Deprection of Farm Equipments	Rs.			59.1
Repair and Maintence of Farm Equipment	Rs.			57.7
Total Cost	Rs.			10683.0
Gross Income	Rs.			13890.3
Main Product	K.G.	2139.7	5.9	12663.9
By-Product	K.G.	2239.4	0.5	1226.4
Gross profit at farm Gate	Rs.			3207.3
Production Cost per Quintal	Rs.			442.0
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			3942.5

Appendix 8 : Average production cost and net profit of Paddy, 1996/97

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			16666.4
Human Labour	Day	179.0	49.2	8802.2
Bullock labour	Day	35.7	62.5	2230.9
Tractor Use	Hour	4.3	300.0	1300.0
Pumpset Use	Hour	4.0	80.0	320.0
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	54.4	10.1	549.7
Organic Manure	K.G.	2551.6	0.3	787.4
Fertilizer	K.G.			
DAP	K.G.	45.3	17.0	768.7
Urea	K.G.	61.3	9.0	552.9
Potash	K.G.	13.9	7.0	97.2
Plant Protection Chemical used	Rs.			226.0
Others	Rs.			
Interest on Variable Cost	Rs.			1031.5
Fixed Cost	Rs.			224.1
Land Tax	Rs.			45.5
Water Tax	Rs.			46.0
Deprection of Farm Equipments	Rs.			67.0
Repair and Maintence of Farm Equipment	Rs.			65.5
Total Cost	Rs.			16890.5
Gross Income	Rs.			21087.8
Main Product	K.G.	2626.3	7.3	19266.5
By-Product	K.G.	2715.1	0.7	1821.4
Gross profit at farm Gate	Rs.			4197.4
Production Cost per Quintal	Rs.			573.8
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			6345.3

Appendix 9 : Average production cost and net profit of Paddy, 1997/98

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			17196.2
Human Labour	Day	172.0	50.0	8601.4
Bullock labour	Day	33.7	61.3	2063.8
Tractor Use	Hour	2.6	224.3	576.7
Pumpset Use	Hour	3.0	64.0	192.0
Threshern Use	Hour	1.0	65.0	65.0
Sprayer Use	Hour			
Seed	K.G.	58.0	11.1	646.1
Organic Manure	K.G.	2954.3	0.6	1759.9
Fertilizer	K.G.			
DAP	K.G.	60.4	17.5	1058.8
Urea	K.G.	48.1	8.1	391.2
Potash	K.G.	14.1	7.6	107.2
Plant Protection Chemical used	Rs.			263.5
Others	Rs.			387.4
Interest on Variable Cost	Rs.			1083.1
Fixed Cost	Rs.			224.6
Land Tax	Rs.			44.8
Water Tax	Rs.			47.3
Deprection of Farm Equipments	Rs.			66.1
Repair and Maintence of Farm Equipment	Rs.			66.3
Total Cost	Rs.			17420.7
Gross Income	Rs.			21377.7
Main Product	K.G.	2555.1	7.8	19866.0
By-Product	K.G.	2672.2	0.6	1511.7
Gross profit at farm Gate	Rs.			3956.9
Production Cost per Quintal	Rs.			622.6
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			6306.6

Appendix 10 : Average production cost and net profit of Paddy, 1998/99

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			18443.1
Human Labour	Day	174.5	51.4	8965.3
Bullock labour	Day	32.4	68.3	2213.6
Tractor Use	Hour	4.8	250.0	1187.5
Pumpset Use	Hour	3.0	116.7	350.0
Threshern Use	Hour	2.0	65.0	130.0
Sprayer Use	Hour			
Seed	K.G.	58.5	11.3	662.5
Organic Manure	K.G.	2720.4	0.4	1199.7
Fertilizer	K.G.			
DAP	K.G.	59.4	18.9	1120.6
Urea	K.G.	51.4	8.5	436.1
Potash	K.G.	16.2	8.8	142.5
Plant Protection Chemical used	Rs.			424.1
Others	Rs.			502.7
Interest on Variable Cost	Rs.			1108.6
Fixed Cost	Rs.			172.6
Land Tax	Rs.			40.3
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			66.4
Repair and Maintence of Farm Equipment	Rs.			65.9
Total Cost	Rs.			18615.7
Gross Income	Rs.			22616.3
Main Product	K.G.	2527.8	8.4	21110.9
By-Product	K.G.	2368.1	0.6	1505.4
Gross profit at farm Gate	Rs.			4000.6
Production Cost per Quintal	Rs.			676.9
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			6546.9

Appendix 11 : Average production cost and net profit of Paddy, 1999/2000

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			21356.3
Human Labour	Day	209.0	62.1	12974.8
Bullock labour	Day	33.6	68.0	2287.1
Tractor Use	Hour	4.0	260.0	1040.0
Pumpset Use	Hour			
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	56.5	13.3	751.2
Organic Manure	K.G.	2643.2	0.4	1173.3
Fertilizer	K.G.			
DAP	K.G.	53.4	20.1	1075.9
Urea	K.G.	51.1	12.9	661.2
Potash	K.G.	12.5	13.2	165.6
Plant Protection Chemical used	Rs.			
Others	Rs.			
Interest on Variable Cost	Rs.			1227.2
Fixed Cost	Rs.			180.8
Land Tax	Rs.			39.8
Water Tax	Rs.			
Depreccion of Farm Equipments	Rs.			67.7
Repair and Maintence of Farm Equipment	Rs.			73.3
Total Cost	Rs.			21537.1
Gross Income	Rs.			26124.1
Main Product	K.G.	2641.8	9.0	23734.6
By-Product	K.G.	2982.4	0.8	2389.5
Gross profit at farm Gate	Rs.			4587.0
Production Cost per Quintal	Rs.			724.8
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			8437.8

Appendix 12 : Average production cost and net profit of Paddy, 2000/01

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			24357.7
Human Labour	Day	165.4	64.2	10619.5
Bullock labour	Day	35.2	71.7	2519.5
Tractor Use	Hour	10.1	223.7	2250.9
Pumpset Use	Hour			
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	56.5	13.5	760.8
Organic Manure	K.G.	2556.6	1.9	4871.8
Fertilizer	K.G.			
DAP	K.G.	54.7	20.5	1121.0
Urea	K.G.	54.1	13.1	710.3
Potash	K.G.	12.4	13.5	168.3
Plant Protection Chemical used	Rs.			57.0
Others	Rs.			
Interest on Variable Cost	Rs.			1278.7
Fixed Cost	Rs.			182.5
Land Tax	Rs.			39.5
Water Tax	Rs.			
Depreccion of Farm Equipments	Rs.			71.7
Repair and Maintence of Farm Equipment	Rs.			71.4
Total Cost	Rs.			24540.2
Gross Income	Rs.			29092.6
Main Product	K.G.	2591.7	9.1	23710.9
By-Product	K.G.	2944.4	1.8	5381.7
Gross profit at farm Gate	Rs.			4552.4
Production Cost per Quintal	Rs.			739.2
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			7275.7

Appendix 13 : Average production cost and net profit of Paddy, 2001/02

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			20291.8
Human Labour	Day	157.0	73.4	11530.8
Bullock labour	Day	27.6	81.0	2239.2
Tractor Use	Hour	2.7	254.8	675.7
Pumpset Use	Hour			
Threshern Use	Hour	3.3	128.6	421.0
Sprayer Use	Hour			
Seed	K.G.	56.2	13.9	780.4
Organic Manure	K.G.	2463.3	0.5	1220.7
Fertilizer	K.G.			
DAP	K.G.	52.9	20.0	1058.3
Urea	K.G.	53.5	14.4	772.8
Potash	K.G.	11.9	14.3	169.9
Plant Protection Chemical used	Rs.			57.0
Others	Rs.			
Interest on Variable Cost	Rs.			1365.9
Fixed Cost	Rs.			181.7
Land Tax	Rs.			38.8
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			71.3
Repair and Maintence of Farm Equipment	Rs.			71.6
Total Cost	Rs.			20473.5
Gross Income	Rs.			26458.6
Main Product	K.G.	2631.9	9.3	24535.1
By-Product	K.G.	2991.1	0.6	1923.6
Gross profit at farm Gate	Rs.			5985.1
Production Cost per Quintal	Rs.			704.8
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			1440.0

Appendix 14 : Average production cost and net profit of Paddy, 2002/03

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			25491.9
Human Labour	Day	161.1	89.8	14468.4
Bullock labour	Day	21.4	144.7	3102.6
Tractor Use	Hour	2.9	324.3	929.8
Pumpset Use	Hour			
Threshern Use	Hour	3.0	130.0	390.0
Sprayer Use	Hour			
Seed	K.G.	54.8	18.7	1024.4
Organic Manure	K.G.	2418.4	0.7	1747.1
Fertilizer	K.G.			
DAP	K.G.	47.8	21.0	1004.6
Urea	K.G.	57.6	15.6	896.1
Potash	K.G.	12.9	15.0	193.9
Plant Protection Chemical used	Rs.			
Others	Rs.			
Interest on Variable Cost	Rs.			1735.1
Fixed Cost	Rs.			181.5
Land Tax	Rs.			38.5
Water Tax	Rs.			
Depreccion of Farm Equipments	Rs.			71.5
Repair and Maintence of Farm Equipment	Rs.			71.5
Total Cost	Rs.			25673.4
Gross Income	Rs.			32595.9
Main Product	K.G.	3019.2	9.4	28500.6
By-Product	K.G.	3369.2	1.2	4095.3
Gross profit at farm Gate	Rs.			6922.5
Production Cost per Quintal	Rs.			714.7
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			8449.9

Appendix 15 : Average production cost and net profit of Paddy, 2006/07

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			22304.6
Human Labour	Day	132.0	97.6	12890.4
Bullock labour	Day	9.1	165.7	1507.2
Tractor Use	Hour	5.1	428.0	2168.5
Pumpset Use	Hour	5.8	104.2	609.3
Threshern Use	Hour	9.4	66.2	620.2
Sprayer Use	Hour	6.4	13.5	86.6
Seed	K.G.	37.5	20.0	751.4
Organic Manure	K.G.	1300.7	0.6	774.2
Fertilizer	K.G.			
DAP	K.G.	30.8	27.9	858.3
Urea	K.G.	37.1	25.4	944.5
Potash	K.G.	15.2	15.8	239.4
Plant Protection Chemical used	Rs.			336.4
Others	Rs.			
Interest on Variable Cost	Rs.			518.3
Fixed Cost	Rs.			406.0
Land Tax	Rs.			42.5
Water Tax	Rs.			41.5
Deprection of Farm Equipments	Rs.			160.3
Repair and Maintence of Farm Equipment	Rs.			161.7
Total Cost	Rs.			22710.5
Gross Income	Rs.			51230.0
Main Product	K.G.	4751.7	10.2	48286.0
By-Product	K.G.	4269.7	0.7	2944.0
Gross profit at farm Gate	Rs.			28519.5
Production Cost per Quintal	Rs.			416.0
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			475.2
Value at Market	K.G.	4514.1	11.3	50933.9
Net Profit	Rs.			30692.2

Appendix 16 : Average production cost and net profit of Paddy, 2008/09

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			26197.5
Human Labour	Day	132.6	107.1	14195.9
Bullock labour	Day	10.8	183.4	1986.3
Tractor Use	Hour	4.8	671.0	3187.3
Pumpset Use	Hour	6.0	101.9	611.4
Threshern Use	Hour	8.9	99.6	882.6
Sprayer Use	Hour	6.1	12.5	77.0
Seed	K.G.	38.4	24.6	946.4
Organic Manure	K.G.	1231.8	0.8	962.1
Fertilizer	K.G.			
DAP	K.G.	31.1	31.6	984.6
Urea	K.G.	40.1	27.7	1108.1
Potash	K.G.	15.8	18.1	284.6
Plant Protection Chemical used	Rs.			371.3
Others	Rs.			
Interest on Variable Cost	Rs.			600.1
Fixed Cost	Rs.			355.8
Land Tax	Rs.			44.1
Water Tax	Rs.			30.8
Depreccion of Farm Equipments	Rs.			137.2
Repair and Maintence of Farm Equipment	Rs.			143.7
Total Cost	Rs.			26553.3
Gross Income	Rs.			53109.2
Main Product	K.G.	4129.1	12.1	49812.7
By-Product	K.G.	4375.3	0.8	3296.5
Gross profit at farm Gate	Rs.			26555.9
Production Cost per Quintal	Rs.			563.2
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			412.9
Value at Market	K.G.	3922.6	12.9	50757.7
Net Profit	Rs.			27088.1

Appendix 17 : Average production cost and net profit of Paddy, 2009/10

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			29695.9
Human Labour	Day	131.8	114.1	15042.6
Bullock labour	Day	10.3	348.3	3578.8
Tractor Use	Hour	5.1	684.2	3493.1
Pumpset Use	Hour	6.8	102.0	693.6
Threshern Use	Hour	8.4	103.4	864.1
Sprayer Use	Hour	7.0	12.5	86.8
Seed	K.G.	38.3	38.7	1484.5
Organic Manure	K.G.	1069.0	0.9	912.3
Fertilizer	K.G.			
DAP	K.G.	28.2	31.3	883.2
Urea	K.G.	46.4	28.0	1298.6
Potash	K.G.	16.5	18.0	296.4
Plant Protection Chemical used	Rs.			382.0
Others	Rs.			
Interest on Variable Cost	Rs.			680.0
Fixed Cost	Rs.			361.0
Land Tax	Rs.			44.1
Water Tax	Rs.			30.8
Deprection of Farm Equipments	Rs.			136.1
Repair and Maintence of Farm Equipment	Rs.			149.9
Total Cost	Rs.			30056.9
Gross Income	Rs.			56707.1
Main Product	K.G.	4250.7	12.3	52422.7
By-Product	K.G.	4501.7	1.0	4284.4
Gross profit at farm Gate	Rs.			26650.2
Production Cost per Quintal	Rs.			606.3
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			425.1
Value at Market	K.G.	4038.1	13.1	53077.8
Net Profit	Rs.			26880.2

Appendix 18 : Average production cost and net profit of Paddy, 2010/11

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			36689.2
Human Labour	Day	134.2	139.0	18653.8
Bullock labour	Day	9.8	418.3	4099.7
Tractor Use	Hour	7.4	757.9	5624.4
Pumpset Use	Hour	6.9	106.8	742.3
Threshern Use	Hour	8.6	100.0	855.2
Sprayer Use	Hour	7.4	18.9	139.6
Seed	K.G.	41.3	33.1	1365.7
Organic Manure	K.G.	1161.4	0.9	1051.1
Fertilizer	K.G.		28.0	
DAP	K.G.	36.6	31.1	1136.0
Urea	K.G.	47.7	28.0	1334.7
Potash	K.G.	18.0	18.2	329.0
Plant Protection Chemical used	Rs.			535.8
Others	Rs.			
Interest on Variable Cost	Rs.			822.1
Fixed Cost	Rs.			250.6
Land Tax	Rs.			41.2
Water Tax	Rs.			28.4
Deprection of Farm Equipments	Rs.			79.2
Repair and Maintence of Farm Equipment	Rs.			101.8
Total Cost	Rs.			36939.8
Gross Income	Rs.			53435.4
Main Product	K.G.	3550.5	14.0	49804.5
By-Product	K.G.	3815.2	1.0	3630.8
Gross profit at farm Gate	Rs.			16495.5
Production Cost per Quintal	Rs.			938.1
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			426.1
Value at Market	K.G.	3373.0	15.2	51182.0
Net Profit	Rs.			17446.9

Appendix 19 : Average production cost and net profit of Paddy, 2011/12

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			48834.0
Human Labour	Day	129.9	213.0	27669.2
Bullock labour	Day	9.2	606.8	5575.6
Tractor Use	Hour	7.8	775.0	6006.3
Pumpset Use	Hour	6.7	141.9	944.3
Threshern Use	Hour	8.8	102.8	907.9
Sprayer Use	Hour	7.8	16.1	125.9
Seed	K.G.	40.1	43.2	1730.0
Organic Manure	K.G.	1154.7	1.0	1098.5
Fertilizer	K.G.			
DAP	K.G.	48.8	31.2	1521.9
Urea	K.G.	44.7	28.1	1256.1
Potash	K.G.	16.0	18.2	291.7
Plant Protection Chemical used	Rs.			582.2
Others	Rs.			
Interest on Variable Cost	Rs.			1124.6
Fixed Cost	Rs.			245.6
Land Tax	Rs.			41.5
Water Tax	Rs.			26.8
Deprection of Farm Equipments	Rs.			78.9
Repair and Maintence of Farm Equipment	Rs.			98.3
Total Cost	Rs.			49079.6
Gross Income	Rs.			62543.2
Main Product	K.G.	3692.2	15.8	58390.3
By-Product	K.G.	3975.6	1.0	4152.9
Gross profit at farm Gate	Rs.			13463.6
Production Cost per Quintal	Rs.			1216.8
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			443.1
Value at Market	K.G.	3507.6	16.8	58895.0
Net Profit	Rs.			13525.3

Appendix 20 : Average production cost and net profit of Paddy, 2012/13

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			59917.3
Human Labour	Day	127.7	287.4	36706.7
Bullock labour	Day	9.7	630.0	6123.6
Tractor Use	Hour	6.4	889.1	5667.8
Pumpset Use	Hour	8.1	192.9	1556.6
Threshern Use	Hour	8.4	108.4	910.6
Sprayer Use	Hour	9.4	19.8	185.3
Seed	K.G.	41.2	49.9	2055.1
Organic Manure	K.G.	1163.8	1.0	1121.9
Fertilizer	K.G.			
DAP	K.G.	29.4	50.0	1470.0
Urea	K.G.	45.6	26.0	1185.6
Potash	K.G.	15.0	36.0	540.0
Plant Protection Chemical used	Rs.			478.0
Others	Rs.			
Interest on Variable Cost	Rs.			1916.0
Fixed Cost	Rs.			237.2
Land Tax	Rs.			47.4
Water Tax	Rs.			21.4
Depreccion of Farm Equipments	Rs.			77.3
Repair and Maintence of Farm Equipment	Rs.			91.0
Total Cost	Rs.			60154.4
Gross Income	Rs.			65566.2
Main Product	K.G.	3654.5	16.9	61622.5
By-Product	K.G.	3904.7	1.0	3943.7
Gross profit at farm Gate	Rs.			5411.8
Production Cost per Quintal	Rs.			1538.1
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			438.5
Value at Market	K.G.	3581.4	18.3	65624.7
Net Profit	Rs.			8975.4

Appendix 21 : Average production cost and net profit of Paddy, 2013/14

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			70863.2
Human Labour	Day	120.6	339.7	40958.5
Bullock labour	Day	7.3	636.6	4641.1
Tractor Use	Hour	9.9	833.3	8214.3
Pumpset Use	Hour	7.1	211.4	1500.1
Threshern Use	Hour	14.0	81.5	1143.0
Sprayer Use	Hour	9.5	19.9	188.4
Seed	K.G.	41.5	61.8	2568.0
Organic Manure	K.G.	1190.1	1.0	1180.5
Fertilizer	K.G.			
DAP	K.G.	38.2	48.0	1834.8
Urea	K.G.	69.0	22.0	1518.7
Potash	K.G.	18.5	34.0	629.7
Plant Protection Chemical used	Rs.			587.3
Others	Rs.			3750.0
Interest on Variable Cost	Rs.			2148.8
Fixed Cost	Rs.			269.1
Land Tax	Rs.			53.9
Water Tax	Rs.			30.7
Deprection of Farm Equipments	Rs.			87.9
Repair and Maintence of Farm Equipment	Rs.			96.5
Total Cost	Rs.			71132.3
Gross Income	Rs.			80722.7
Main Product	K.G.	3825.4	19.9	76155.4
By-Product	K.G.	4016.6	1.1	4567.3
Gross profit at farm Gate	Rs.			9590.4
Production Cost per Quintal	Rs.			1740.1
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			902.8
Value at Market	K.G.	3595.8	21.0	75483.5
Net Profit	Rs.			8015.7

Appendix 22 : Average production cost and net profit of Maize, 1993/94

Particular	Unit	Quantity	price	Values
Average cost of production per hectare				
Variable cost	Rs.			7949.2
Human Labour	Day	140.8	29.6	4174.2
Bullock labour	Day	28.9	39.0	1127.2
Tractor Use	Hour	1.0	200.0	200.0
Pumpset Use	Hour	25.0	5.3	131.3
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	124.5	5.8	724.4
Organic Manure	K.G.	4540.3	0.2	933.8
Fertilizer	K.G.			
DAP	K.G.			
Urea	K.G.			
Potash	K.G.			
Plant Protection Chemical used	Rs.			163.0
Others	Rs.			
Interest on Variable Cost	Rs.			495.3
Fixed Cost	Rs.			205.2
Land Tax	Rs.			29.0
Water Tax	Rs.			59.0
Deprection of Farm Equipments	Rs.			62.4
Repair and Maintence of Farm Equipment	Rs.			54.8
Total Cost	Rs.			8154.4
Gross Income	Rs.			8636.2
Main Product	K.G.	1643.2	5.0	8178.7
By-Product	K.G.	1856.5	0.2	457.5
Gross profit at farm Gate	Rs.			481.8
Production Cost per Quintal	Rs.			468.4
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			1888.6

Appendix 23 : Average production cost and net profit of Maize, 1994/95

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			8703.1
Human Labour	Day	136.0	34.2	4648.3
Bullock labour	Day	30.5	40.1	1223.4
Tractor Use	Hour	1.0	270.0	270.0
Pumpset Use	Hour			
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	28.0	7.9	220.3
Organic Manure	K.G.	4614.7	0.2	1041.6
Fertilizer	K.G.			
DAP	K.G.	26.5	9.2	244.5
Urea	K.G.	32.0	9.1	292.3
Potash	K.G.	8.0	8.7	69.2
Plant Protection Chemical used	Rs.			138.0
Others	Rs.			
Interest on Variable Cost	Rs.			555.6
Fixed Cost	Rs.			178.8
Land Tax	Rs.			30.1
Water Tax	Rs.			29.3
Depreccion of Farm Equipments	Rs.			62.3
Repair and Maintence of Farm Equipment	Rs.			57.1
Total Cost	Rs.			8881.9
Gross Income	Rs.			9326.8
Main Product	K.G.	1540.0	5.8	8910.0
By-Product	K.G.	1948.4	0.2	416.8
Gross profit at farm Gate	Rs.			444.9
Production Cost per Quintal	Rs.			549.7
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			1107.8

Appendix 24 : Average production cost and net profit of Maize, 1996/97

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			13584.7
Human Labour	Day	146.8	47.9	7024.7
Bullock labour	Day	28.2	57.1	1612.2
Tractor Use	Hour	4.0	275.0	1100.0
Pumpset Use	Hour			
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	25.6	10.3	262.8
Organic Manure	K.G.	6010.1	0.2	1433.2
Fertilizer	K.G.			
DAP	K.G.	37.1	16.2	600.3
Urea	K.G.	46.8	8.4	392.0
Potash	K.G.	13.0	8.0	104.0
Plant Protection Chemical used	Rs.			101.3
Others	Rs.			126.7
Interest on Variable Cost	Rs.			827.4
Fixed Cost	Rs.			224.1
Land Tax	Rs.			34.6
Water Tax	Rs.			66.0
Deprection of Farm Equipments	Rs.			65.3
Repair and Maintence of Farm Equipment	Rs.			58.2
Total Cost	Rs.			13808.9
Gross Income	Rs.			14610.1
Main Product	K.G.	1996.3	7.0	13902.7
By-Product	K.G.	2572.3	0.3	707.4
Gross profit at farm Gate	Rs.			801.2
Production Cost per Quintal	Rs.			656.3
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			2548.3

Appendix 25 : Average production cost and net profit of Maize, 1997/98

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			13297.6
Human Labour	Day	139.1	48.6	6754.9
Bullock labour	Day	25.4	62.9	1598.4
Tractor Use	Hour	4.0	270.0	1080.0
Pumpset Use	Hour			
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	27.4	10.9	298.8
Organic Manure	K.G.	4030.9	0.3	1166.1
Fertilizer	K.G.			
DAP	K.G.	40.6	17.4	704.7
Urea	K.G.	25.5	7.8	198.4
Potash	K.G.	12.3	7.6	93.4
Plant Protection Chemical used	Rs.			600.0
Others	Rs.			
Interest on Variable Cost	Rs.			802.9
Fixed Cost	Rs.			231.6
Land Tax	Rs.			39.3
Water Tax	Rs.			66.0
Depreccion of Farm Equipments	Rs.			65.6
Repair and Maintence of Farm Equipment	Rs.			60.7
Total Cost	Rs.			13529.2
Gross Income	Rs.			13863.7
Main Product	K.G.	1897.3	7.0	13362.3
By-Product	K.G.	2005.4	0.3	501.4
Gross profit at farm Gate	Rs.			334.5
Production Cost per Quintal	Rs.			686.7
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			2601.3

Appendix 26 : Average production cost and net profit of Maize, 1998/99

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			12560.8
Human Labour	Day	144.0	48.7	7008.0
Bullock labour	Day	26.7	62.7	1675.3
Tractor Use	Hour	2600.0		
Pumpset Use	Hour			
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	24.9	14.5	360.7
Organic Manure	K.G.	4257.1	0.3	1262.9
Fertilizer	K.G.			
DAP	K.G.	43.8	18.9	828.9
Urea	K.G.	32.5	8.5	277.8
Potash	K.G.	27.5	8.5	233.8
Plant Protection Chemical used	Rs.			62.3
Others	Rs.			
Interest on Variable Cost	Rs.			851.1
Fixed Cost	Rs.			309.5
Land Tax	Rs.			33.4
Water Tax	Rs.			150.0
Deprection of Farm Equipments	Rs.			65.7
Repair and Maintence of Farm Equipment	Rs.			60.5
Total Cost	Rs.			12870.3
Gross Income	Rs.			18016.8
Main Product	K.G.	2069.5	8.4	17314.5
By-Product	K.G.	2120.1	0.3	702.3
Gross profit at farm Gate	Rs.			5146.4
Production Cost per Quintal	Rs.			588.0
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			5695.4

Appendix 27 : Average production cost and net profit of Maize, 1999/00

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			15618.2
Human Labour	Day	140.4	63.8	8957.5
Bullock labour	Day	25.9	70.8	1832.3
Tractor Use	Hour	3.0	270.0	810.0
Pumpset Use	Hour	15.0		
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	27.2	17.3	470.4
Organic Manure	K.G.	3712.4	0.3	1173.1
Fertilizer	K.G.			
DAP	K.G.	36.4	20.8	758.0
Urea	K.G.	34.5	12.5	430.7
Potash	K.G.	13.7	12.7	173.1
Plant Protection Chemical used	Rs.			
Others	Rs.			
Interest on Variable Cost	Rs.			1013.0
Fixed Cost	Rs.			180.3
Land Tax	Rs.			38.6
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			70.0
Repair and Maintence of Farm Equipment	Rs.			71.8
Total Cost	Rs.			15798.4
Gross Income	Rs.			19463.5
Main Product	K.G.	2008.7	9.0	18126.7
By-Product	K.G.	3784.9	0.4	1336.8
Gross profit at farm Gate	Rs.			3665.1
Production Cost per Quintal	Rs.			719.9
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			4804.5

Appendix 28 : Average production cost and net profit of Maize, 2000/01

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			16412.1
Human Labour	Day	140.6	66.9	9401.5
Bullock labour	Day	22.8	73.8	1684.0
Tractor Use	Hour	4.0	280.0	1120.0
Pumpset Use	Hour			
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	27.9	18.7	520.6
Organic Manure	K.G.	3763.3	0.3	1270.1
Fertilizer	K.G.			
DAP	K.G.	33.9	20.8	703.4
Urea	K.G.	42.9	12.6	538.8
Potash	K.G.	9.1	12.3	111.6
Plant Protection Chemical used	Rs.			
Others	Rs.			
Interest on Variable Cost	Rs.			1062.0
Fixed Cost	Rs.			174.8
Land Tax	Rs.			32.6
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			70.9
Repair and Maintence of Farm Equipment	Rs.			71.3
Total Cost	Rs.			16586.9
Gross Income	Rs.			19984.0
Main Product	K.G.	1990.8	9.4	18705.5
By-Product	K.G.	3567.8	0.4	1278.5
Gross profit at farm Gate	Rs.			3397.2
Production Cost per Quintal	Rs.			768.9
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			4610.4

Appendix 29 : Average production cost and net profit of Maize, 2001/02

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			16198.5
Human Labour	Day	137.2	71.3	9773.1
Bullock labour	Day	23.2	81.9	1896.8
Tractor Use	Hour	2.1	272.5	579.1
Pumpset Use	Hour			
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	27.9	18.7	520.4
Organic Manure	K.G.	3447.9	0.3	1163.7
Fertilizer	K.G.			
DAP	K.G.	31.4	20.0	626.1
Urea	K.G.	31.2	14.4	449.5
Potash	K.G.	6.8	14.2	96.1
Plant Protection Chemical used	Rs.			
Others	Rs.			
Interest on Variable Cost	Rs.			1093.7
Fixed Cost	Rs.			174.7
Land Tax	Rs.			32.6
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			70.9
Repair and Maintence of Farm Equipment	Rs.		0.6	71.3
Total Cost	Rs.			16373.3
Gross Income	Rs.			20780.5
Main Product	K.G.	1994.6	9.7	19314.6
By-Product	K.G.	3571.8	0.4	1465.9
Gross profit at farm Gate	Rs.			4407.3
Production Cost per Quintal	Rs.			747.4
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			4938.6

Appendix 30 : Average production cost and net profit of Maize, 2002/03

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			22297.2
Human Labour	Day	135.9	91.3	12404.3
Bullock labour	Day	22.7	145.3	3296.8
Tractor Use	Hour	3.0	300.0	900.0
Pumpset Use	Hour			
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	26.4	22.4	591.5
Organic Manure	K.G.	3028.1	0.8	2346.8
Fertilizer	K.G.			
DAP	K.G.	30.6	21.9	670.4
Urea	K.G.	31.3	15.8	493.9
Potash	K.G.	7.2	14.8	106.6
Plant Protection Chemical used	Rs.			
Others	Rs.			
Interest on Variable Cost	Rs.			1487.0
Fixed Cost	Rs.			172.8
Land Tax	Rs.			31.3
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			71.4
Repair and Maintence of Farm Equipment	Rs.			70.1
Total Cost	Rs.			22470.0
Gross Income	Rs.			25565.9
Main Product	K.G.	2333.4	9.9	23028.1
By-Product	K.G.	4413.5	0.6	2537.8
Gross profit at farm Gate	Rs.			3095.9
Production Cost per Quintal	Rs.			854.2
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			4114.1

Appendix 31: Average production cost and net profit of Maize, 2006/07

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			21221.9
Human Labour	Day	129.8	96.5	12518.5
Bullock labour	Day	11.2	153.2	1721.6
Tractor Use	Hour	5.0	399.3	1996.4
Pumpset Use	Hour	4.6	98.0	450.8
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	23.6	35.3	832.5
Organic Manure	K.G.	1801.4	0.6	1075.5
Fertilizer	K.G.			
DAP	K.G.	22.4	27.9	624.6
Urea	K.G.	41.2	24.8	1020.9
Potash	K.G.	13.3	16.6	220.7
Plant Protection Chemical used	Rs.			282.9
Others	Rs.			
Interest on Variable Cost	Rs.			477.3
Fixed Cost	Rs.			280.3
Land Tax	Rs.			42.1
Water Tax	Rs.			60.0
Deprection of Farm Equipments	Rs.			94.2
Repair and Maintence of Farm Equipment	Rs.			84.0
Total Cost	Rs.			21502.2
Gross Income	Rs.			27769.6
Main Product	K.G.	2819.5	9.4	26511.9
By-Product	K.G.	3534.2	0.4	1257.8
Gross profit at farm Gate	Rs.			6267.4
Production Cost per Quintal	Rs.			718.0
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			282.0
Value at Market	K.G.	2678.5	10.3	27486.1
Net Profit	Rs.			6959.7

Appendix 32 : Average production cost and net profit of Maize, 2008/09

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			22666.8
Human Labour	Day	120.9	98.2	11871.9
Bullock labour	Day	11.5	173.2	1995.9
Tractor Use	Hour	5.0	650.0	3250.0
Pumpset Use	Hour	6.7	100.0	666.7
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	23.2	29.4	683.5
Organic Manure	K.G.	1719.1	0.7	1226.0
Fertilizer	K.G.			
DAP	K.G.	21.2	32.3	683.9
Urea	K.G.	45.8	28.2	1293.0
Potash	K.G.	13.8	18.0	247.5
Plant Protection Chemical used	Rs.			272.4
Others	Rs.			
Interest on Variable Cost	Rs.			476.2
Fixed Cost	Rs.			273.7
Land Tax	Rs.			42.3
Water Tax	Rs.			56.3
Deprection of Farm Equipments	Rs.			83.2
Repair and Maintence of Farm Equipment	Rs.			92.0
Total Cost	Rs.			22940.6
Gross Income	Rs.			33103.0
Main Product	K.G.	3102.8	10.1	31346.3
By-Product	K.G.	3729.3	0.5	1756.7
Gross profit at farm Gate	Rs.			10162.5
Production Cost per Quintal	Rs.			682.7
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			310.3
Value at Market	K.G.	2947.7	11.0	32354.3
Net Profit	Rs.			10860.2

Appendix 33 : Average production cost and net profit of Maize, 2009/10

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			28776.6
Human Labour	Day	122.7	102.9	12629.0
Bullock labour	Day	12.2	326.3	3984.5
Tractor Use	Hour	5.4	714.3	3877.6
Pumpset Use	Hour	7.5	100.0	750.0
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	22.9	35.5	815.2
Organic Manure	K.G.	1585.6	2.2	3488.3
Fertilizer	K.G.			
DAP	K.G.	22.2	31.8	707.4
Urea	K.G.	51.1	28.3	1442.9
Potash	K.G.	14.0	18.0	252.0
Plant Protection Chemical used	Rs.			272.4
Others	Rs.			
Interest on Variable Cost	Rs.			557.3
Fixed Cost	Rs.			273.7
Land Tax	Rs.			42.3
Water Tax	Rs.			56.3
Depreccion of Farm Equipments	Rs.			83.2
Repair and Maintence of Farm Equipment	Rs.			92.0
Total Cost	Rs.			29050.3
Gross Income	Rs.			36745.5
Main Product	K.G.	3262.4	10.5	34392.2
By-Product	K.G.	3837.9	0.6	2353.3
Gross profit at farm Gate	Rs.			7695.2
Production Cost per Quintal	Rs.			818.3
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			335.2
Value at Market	K.G.	3099.3	11.3	35037.8
Net Profit	Rs.			8005.6

Appendix 34 : Average production cost and net profit of Maize, 2010/11

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			26928.2
Human Labour	Day	122.7	107.4	13178.1
Bullock labour	Day	12.2	331.6	4048.8
Tractor Use	Hour	5.4	657.1	3567.3
Pumpset Use	Hour	7.5	100.0	750.0
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	22.9	36.3	832.1
Organic Manure	K.G.	1661.2	0.8	1302.7
Fertilizer	K.G.			
DAP	K.G.	22.2	31.8	707.4
Urea	K.G.	51.1	28.3	1442.9
Potash	K.G.	14.0	18.0	252.0
Plant Protection Chemical used	Rs.			272.4
Others	Rs.			
Interest on Variable Cost	Rs.			574.5
Fixed Cost	Rs.			273.7
Land Tax	Rs.			42.3
Water Tax	Rs.			56.3
Deprection of Farm Equipments	Rs.			83.2
Repair and Maintence of Farm Equipment	Rs.			92.0
Total Cost	Rs.			27201.9
Gross Income	Rs.			36745.5
Main Product	K.G.	3262.4	10.5	34392.2
By-Product	K.G.	3837.9	0.6	2353.3
Gross profit at farm Gate	Rs.			9543.6
Production Cost per Quintal	Rs.			761.7
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			335.2
Value at Market	K.G.	3099.3	11.3	35037.8
Net Profit	Rs.			9854.0

Appendix 35 : Average production cost and net profit of Maize, 2011/12

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			43713.0
Human Labour	Day	122.1	203.5	24837.2
Bullock labour	Day	11.7	592.5	6932.3
Tractor Use	Hour	7.1	766.7	5451.9
Pumpset Use	Hour			
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	23.6	54.0	1274.4
Organic Manure	K.G.	1560.0	0.9	1443.0
Fertilizer	K.G.			
DAP	K.G.	26.0	31.4	816.4
Urea	K.G.	51.0	28.3	1443.3
Potash	K.G.	17.5	18.0	315.0
Plant Protection Chemical used	Rs.			236.0
Others	Rs.			
Interest on Variable Cost	Rs.			963.6
Fixed Cost	Rs.			257.8
Land Tax	Rs.			40.7
Water Tax	Rs.			45.0
Deprection of Farm Equipments	Rs.			82.2
Repair and Maintence of Farm Equipment	Rs.			90.0
Total Cost	Rs.			43970.8
Gross Income	Rs.			53453.9
Main Product	K.G.	3259.8	15.5	50372.9
By-Product	K.G.	3803.7	0.8	3081.0
Gross profit at farm Gate	Rs.			9483.1
Production Cost per Quintal	Rs.			1254.4
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			326.0
Value at Market	K.G.	3096.8	16.3	50608.8
Net Profit	Rs.			9393.1

Appendix 36 : Average production cost and net profit of Maize, 2012/13

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			51598.7
Human Labour	Day	115.5	268.1	30973.2
Bullock labour	Day	10.6	611.5	6491.7
Tractor Use	Hour	6.3	839.3	5275.5
Pumpset Use	Hour	5.0	196.4	982.1
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	23.9	56.6	1354.4
Organic Manure	K.G.	1430.8	1.0	1408.8
Fertilizer	K.G.			
DAP	K.G.	32.3	50.0	1615.4
Urea	K.G.	50.0	26.0	1300.0
Potash	K.G.	17.1	36.0	617.1
Plant Protection Chemical used	Rs.			408.8
Others	Rs.			
Interest on Variable Cost	Rs.			1171.5
Fixed Cost	Rs.			235.9
Land Tax	Rs.			43.6
Water Tax	Rs.			24.2
Deprection of Farm Equipments	Rs.			77.5
Repair and Maintence of Farm Equipment	Rs.			90.6
Total Cost	Rs.			51834.5
Gross Income	Rs.			54997.9
Main Product	K.G.	3318.6	15.7	51984.8
By-Product	K.G.	3766.4	0.8	3013.1
Gross profit at farm Gate	Rs.			3163.4
Production Cost per Quintal	Rs.			1471.1
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			344.9
Value at Market	K.G.	3152.7	16.7	52560.1
Net Profit	Rs.			3393.8

Appendix 37 : Average production cost and net profit of Maize, 2013/14

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			62805.3
Human Labour	Day	115.9	352.0	40796.8
Bullock labour	Day	10.9	632.3	6891.5
Tractor Use	Hour	6.6	830.0	5478.0
Pumpset Use	Hour	5.2	211.0	1097.2
Threshern Use	Hour			
Sprayer Use	Hour			
Seed	K.G.	24.2	71.9	1740.0
Organic Manure	K.G.	1456.3	1.0	1456.3
Fertilizer	K.G.			
DAP	K.G.	27.8	48.0	1332.0
Urea	K.G.	52.9	22.0	1163.8
Potash	K.G.	15.0	24.7	370.0
Plant Protection Chemical used	Rs.			488.8
Others	Rs.			
Interest on Variable Cost	Rs.			1990.9
Fixed Cost	Rs.			262.8
Land Tax	Rs.			52.5
Water Tax	Rs.			24.5
Deprection of Farm Equipments	Rs.			88.9
Repair and Maintence of Farm Equipment	Rs.			97.0
Total Cost	Rs.			63068.1
Gross Income	Rs.			67753.7
Main Product	K.G.	3887.1	16.4	63621.3
By-Product	K.G.	4081.4	1.0	4132.4
Gross profit at farm Gate	Rs.			4685.6
Production Cost per Quintal	Rs.			1516.2
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			932.9
Value at Market	K.G.	3653.8	17.4	63722.7
Net Profit	Rs.			3854.2

Appendix 38 : Average production cost and net profit of Wheat, 1993/94

Particular	Unit	Quantity	price	Values
Average cost of production per hectare				
Variable cost	Rs.			9357.5
Human Labour	Day	110.5	30.7	3396.5
Bullock labour	Day	29.8	40.6	1209.2
Tractor Use	Hour	7.5	89.0	667.5
Pumpset Use	Hour	12.8	46.5	596.8
Threshern Use	Hour	6.5	52.5	341.3
Sprayer Use	Hour	9.7	34.3	331.9
Seed	K.G.	99.3	9.1	905.9
Organic Manure	K.G.	2354.8	0.2	577.3
Fertilizer	K.G.			
DAP	K.G.	57.5	6.0	345.0
Urea	K.G.	23.5	9.0	211.5
Potash	K.G.	7.5	9.0	67.5
Plant Protection Chemical used	Rs.			149.3
Others	Rs.			
Interest on Variable Cost	Rs.			557.9
Fixed Cost	Rs.			216.0
Land Tax	Rs.			41.9
Water Tax	Rs.			61.2
Deprection of Farm Equipments	Rs.			59.0
Repair and Maintence of Farm Equipment	Rs.			53.8
Total Cost	Rs.			9573.4
Gross Income	Rs.			9586.2
Main Product	K.G.	1537.1	6.0	9160.8
By-Product	K.G.	1579.2	0.3	425.4
Gross profit at farm Gate	Rs.			12.7
Production Cost per Quintal	Rs.			595.1
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			1335.5

Appendix 39 : Average production cost and net profit of Wheat, 1994/95

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			8181.6
Human Labour	Day	123.5	30.2	3724.3
Bullock labour	Day	35.3	40.3	1424.8
Tractor Use	Hour	2.8	110.0	310.8
Pumpset Use	Hour	6.0	42.5	255.0
Threshern Use	Hour	5.5	48.8	268.1
Sprayer Use	Hour			
Seed	K.G.	120.3	8.7	1049.9
Organic Manure	K.G.	1689.1	0.2	394.5
Fertilizer	K.G.			
DAP	K.G.			
Urea	K.G.			
Potash	K.G.			
Plant Protection Chemical used	Rs.			187.5
Others	Rs.			
Interest on Variable Cost	Rs.			566.8
Fixed Cost	Rs.			203.4
Land Tax	Rs.			34.8
Water Tax	Rs.			42.5
Deprection of Farm Equipments	Rs.			60.3
Repair and Maintence of Farm Equipment	Rs.			65.8
Total Cost	Rs.			8385.1
Gross Income	Rs.			9590.7
Main Product	K.G.	1484.0	6.1	9091.6
By-Product	K.G.	1726.6	0.3	499.1
Gross profit at farm Gate	Rs.			1205.7
Production Cost per Quintal	Rs.			531.4
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			1297.5

Appendix 40 : Average production cost and net profit of Wheat, 1996/97

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			14391.0
Human Labour	Day	120.3	50.0	6015.0
Bullock labour	Day	25.5	59.7	1519.5
Tractor Use	Hour	5.0	215.0	1075.0
Pumpset Use	Hour	8.3	70.0	577.5
Threshern Use	Hour	14.5	55.0	797.5
Sprayer Use	Hour			
Seed	K.G.	119.5	11.7	1397.8
Organic Manure	K.G.	2261.2	0.3	670.6
Fertilizer	K.G.			
DAP	K.G.	44.8	17.0	762.9
Urea	K.G.	42.8	8.5	364.1
Potash	K.G.	7.8	9.0	69.8
Plant Protection Chemical used	Rs.			300.0
Others	Rs.			
Interest on Variable Cost	Rs.			841.4
Fixed Cost	Rs.			222.0
Land Tax	Rs.			35.1
Water Tax	Rs.			60.0
Deprection of Farm Equipments	Rs.			62.5
Repair and Maintence of Farm Equipment	Rs.			64.4
Total Cost	Rs.			14613.1
Gross Income	Rs.			14690.4
Main Product	K.G.	1755.5	7.9	13780.7
By-Product	K.G.	2352.9	0.4	909.8
Gross profit at farm Gate	Rs.			77.4
Production Cost per Quintal	Rs.			780.6
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			2502.3

Appendix 41 : Average production cost and net profit of Wheat, 1997/98

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			15145.8
Human Labour	Day	114.9	50.6	5808.3
Bullock labour	Day	19.9	68.6	1364.6
Tractor Use	Hour	5.9	221.4	1296.9
Pumpset Use	Hour	8.0	57.3	458.7
Threshern Use	Hour	6.9	111.4	764.1
Sprayer Use	Hour			
Seed	K.G.	120.4	11.7	1408.5
Organic Manure	K.G.	2632.4	0.3	912.6
Fertilizer	K.G.			
DAP	K.G.	59.1	17.8	1053.2
Urea	K.G.	63.0	8.2	514.5
Potash	K.G.	21.2	9.0	190.1
Plant Protection Chemical used	Rs.			118.5
Others	Rs.	59.0	6.0	354.0
Interest on Variable Cost	Rs.			901.9
Fixed Cost	Rs.			197.3
Land Tax	Rs.			39.0
Water Tax	Rs.			33.0
Deprection of Farm Equipments	Rs.			63.6
Repair and Maintence of Farm Equipment	Rs.			61.7
Total Cost	Rs.			15343.1
Gross Income	Rs.			15833.1
Main Product	K.G.	1874.2	7.9	14889.7
By-Product	K.G.	2219.9	0.4	943.5
Gross profit at farm Gate	Rs.			490.0
Production Cost per Quintal	Rs.			768.3
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			2747.0

Appendix 42 : Average production cost and net profit of Wheat, 1998/99

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			16331.3
Human Labour	Day	112.0	51.3	5748.3
Bullock labour	Day	22.7	66.1	1499.9
Tractor Use	Hour	4.0	225.0	900.0
Pumpset Use	Hour	8.0	58.8	470.0
Threshern Use	Hour	9.8	78.0	764.4
Sprayer Use	Hour	22.0	60.0	1320.0
Seed	K.G.	122.2	14.1	1724.3
Organic Manure	K.G.	2438.5	0.4	1047.5
Fertilizer	K.G.			
DAP	K.G.	64.3	18.8	1207.0
Urea	K.G.	64.1	8.3	529.8
Potash	K.G.	19.6	9.2	180.3
Plant Protection Chemical used	Rs.			
Others	Rs.			
Interest on Variable Cost	Rs.			939.8
Fixed Cost	Rs.			162.5
Land Tax	Rs.			33.7
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			63.9
Repair and Maintence of Farm Equipment	Rs.			64.9
Total Cost	Rs.			16493.8
Gross Income	Rs.			18588.8
Main Product	K.G.	1951.7	9.0	17607.3
By-Product	K.G.	2001.1	0.5	981.5
Gross profit at farm Gate	Rs.			2095.0
Production Cost per Quintal	Rs.			794.8
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			4902.1

Appendix 43 : Average production cost and net profit of Wheat, 1999/00

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			17565.1
Human Labour	Day	117.8	62.6	7374.4
Bullock labour	Day	20.9	69.8	1456.7
Tractor Use	Hour	4.5	237.5	1068.8
Pumpset Use	Hour	7.4	78.0	577.2
Threshern Use	Hour	4.9	130.6	640.9
Sprayer Use	Hour			
Seed	K.G.	121.0	19.2	2325.5
Organic Manure	K.G.	2272.1	0.5	1081.2
Fertilizer	K.G.			
DAP	K.G.	53.6	21.2	1135.5
Urea	K.G.	54.0	11.4	618.6
Potash	K.G.	14.5	12.1	175.2
Plant Protection Chemical used	Rs.			
Others	Rs.			
Interest on Variable Cost	Rs.			1111.1
Fixed Cost	Rs.			172.2
Land Tax	Rs.			34.4
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			68.7
Repair and Maintence of Farm Equipment	Rs.			69.1
Total Cost	Rs.			17737.3
Gross Income	Rs.			20742.3
Main Product	K.G.	2004.7	9.7	19389.9
By-Product	K.G.	2120.1	0.6	1352.5
Gross profit at farm Gate	Rs.			3005.0
Production Cost per Quintal	Rs.			817.3
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			4375.8

Appendix 44 : Average production cost and net profit of Wheat, 2000/01

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			18659.4
Human Labour	Day	115.3	66.0	7616.7
Bullock labour	Day	21.0	76.0	1596.7
Tractor Use	Hour	4.3	269.2	1149.4
Pumpset Use	Hour	8.4	82.1	686.5
Threshern Use	Hour	5.9	138.9	825.6
Sprayer Use	Hour			
Seed	K.G.	119.7	20.0	2394.5
Organic Manure	K.G.	2327.1	0.5	1155.3
Fertilizer	K.G.			
DAP	K.G.	54.9	21.5	1178.2
Urea	K.G.	59.1	11.5	677.6
Potash	K.G.	16.6	12.5	206.6
Plant Protection Chemical used	Rs.			
Others	Rs.			
Interest on Variable Cost	Rs.			1172.3
Fixed Cost	Rs.			168.3
Land Tax	Rs.			33.9
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			68.0
Repair and Maintence of Farm Equipment	Rs.			66.4
Total Cost	Rs.			18827.7
Gross Income	Rs.			20723.1
Main Product	K.G.	2008.8	9.7	19523.4
By-Product	K.G.	2141.1	0.6	1199.8
Gross profit at farm Gate	Rs.			1895.4
Production Cost per Quintal	Rs.			877.5
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			3848.9

Appendix 45 : Average production cost and net profit of Wheat, 2001/02

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			18559.2
Human Labour	Day	114.7	70.9	8124.7
Bullock labour	Day	19.4	81.9	1592.7
Tractor Use	Hour	3.6	265.6	946.3
Pumpset Use	Hour	5.6	82.1	457.7
Threshern Use	Hour	5.5	138.9	763.9
Sprayer Use	Hour			
Seed	K.G.	119.7	20.0	2394.5
Organic Manure	K.G.	2264.1	0.5	1128.2
Fertilizer	K.G.			
DAP	K.G.	52.9	19.4	1024.7
Urea	K.G.	54.2	13.8	748.5
Potash	K.G.	12.2	14.0	171.3
Plant Protection Chemical used	Rs.			
Others	Rs.			
Interest on Variable Cost	Rs.			1206.8
Fixed Cost	Rs.			168.3
Land Tax	Rs.			33.9
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			68.0
Repair and Maintence of Farm Equipment	Rs.			66.4
Total Cost	Rs.			18727.5
Gross Income	Rs.			21704.6
Main Product	K.G.	2078.1	9.8	20397.7
By-Product	K.G.	2216.5	0.6	1307.0
Gross profit at farm Gate	Rs.			2977.1
Production Cost per Quintal	Rs.			838.3
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			4225.4

Appendix 46 : Average production cost and net profit of Wheat, 2002/03

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			22360.5
Human Labour	Day	115.1	86.5	9951.8
Bullock labour	Day	16.4	141.3	2316.5
Tractor Use	Hour	3.5	316.7	1108.3
Pumpset Use	Hour	5.8	97.5	568.8
Threshern Use	Hour	4.9	137.1	666.1
Sprayer Use	Hour			
Seed	K.G.	121.3	21.8	2641.3
Organic Manure	K.G.	1962.5	0.8	1520.9
Fertilizer	K.G.			
DAP	K.G.	51.1	21.0	1069.5
Urea	K.G.	58.2	15.3	889.7
Potash	K.G.	9.9	15.1	149.0
Plant Protection Chemical used	Rs.			
Others	Rs.			
Interest on Variable Cost	Rs.			1478.6
Fixed Cost	Rs.			166.7
Land Tax	Rs.			33.1
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			67.9
Repair and Maintence of Farm Equipment	Rs.			65.8
Total Cost	Rs.			22527.2
Gross Income	Rs.			25089.7
Main Product	K.G.	2303.8	9.8	22553.7
By-Product	K.G.	2444.3	1.0	2536.0
Gross profit at farm Gate	Rs.			2562.5
Production Cost per Quintal	Rs.			867.8
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			
Value at Market	K.G.			
Net Profit	Rs.			3684.9

Appendix 47 : Average production cost and net profit of Wheat, 2006/07

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			22255.8
Human Labour	Day	116.2	90.9	10565.8
Bullock labour	Day	12.4	141.3	1756.8
Tractor Use	Hour	4.0	441.7	1766.7
Pumpset Use	Hour	4.0	98.3	393.3
Threshern Use	Hour	9.4	74.2	694.6
Sprayer Use	Hour	5.3	13.5	71.4
Seed	K.G.	123.8	20.9	2587.1
Organic Manure	K.G.	1617.4	0.8	1369.8
Fertilizer	K.G.			
DAP	K.G.	29.1	27.0	784.7
Urea	K.G.	47.5	24.0	1140.0
Potash	K.G.	17.5	15.5	271.3
Plant Protection Chemical used	Rs.			351.1
Others	Rs.			
Interest on Variable Cost	Rs.			503.2
Fixed Cost	Rs.			218.6
Land Tax	Rs.			41.1
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			91.4
Repair and Maintence of Farm Equipment	Rs.			86.1
Total Cost	Rs.			22474.4
Gross Income	Rs.			33794.3
Main Product	K.G.	2941.6	10.7	31539.1
By-Product	K.G.	3032.3	0.7	2255.3
Gross profit at farm Gate	Rs.			11319.9
Production Cost per Quintal	Rs.			687.4
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			294.2
Value at Market	K.G.	2794.5	11.6	32468.4
Net Profit	Rs.			11955.2

Appendix 48 : Average production cost and net profit of Wheat, 2008/09

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			26142.3
Human Labour	Day	118.3	95.9	11342.3
Bullock labour	Day	14.1	172.1	2418.9
Tractor Use	Hour	4.7	700.0	3300.0
Pumpset Use	Hour	4.2	103.3	430.6
Threshern Use	Hour	8.0	100.0	800.0
Sprayer Use	Hour	4.4	12.9	57.3
Seed	K.G.	124.1	25.7	3194.2
Organic Manure	K.G.	1414.6	0.8	1061.0
Fertilizer	K.G.			
DAP	K.G.	28.8	32.6	938.0
Urea	K.G.	48.5	28.6	1385.9
Potash	K.G.	16.0	18.2	291.2
Plant Protection Chemical used	Rs.			356.9
Others	Rs.			
Interest on Variable Cost	Rs.			566.0
Fixed Cost	Rs.			219.6
Land Tax	Rs.			41.3
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			85.6
Repair and Maintence of Farm Equipment	Rs.			92.6
Total Cost	Rs.			26361.9
Gross Income	Rs.			39465.5
Main Product	K.G.	3075.5	12.0	36969.7
By-Product	K.G.	3289.1	0.8	2495.9
Gross profit at farm Gate	Rs.			13103.6
Production Cost per Quintal	Rs.			776.0
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			307.6
Value at Market	K.G.	2921.8	12.9	37759.4
Net Profit	Rs.			13585.8

Appendix 49 : Average production cost and net profit of Wheat, 2009/10

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			29753.7
Human Labour	Day	120.4	106.9	12880.9
Bullock labour	Day	12.7	325.0	4129.4
Tractor Use	Hour	4.9	700.0	3400.0
Pumpset Use	Hour	5.6	102.9	573.1
Threshern Use	Hour	8.3	100.0	828.6
Sprayer Use	Hour	5.6	12.2	68.3
Seed	K.G.	123.3	25.6	3155.3
Organic Manure	K.G.	1393.4	0.8	1154.8
Fertilizer	K.G.			
DAP	K.G.	26.5	31.8	840.8
Urea	K.G.	49.4	28.4	1405.0
Potash	K.G.	17.1	18.0	308.6
Plant Protection Chemical used	Rs.			363.8
Others	Rs.			
Interest on Variable Cost	Rs.			645.2
Fixed Cost	Rs.			218.9
Land Tax	Rs.			41.1
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			85.2
Repair and Maintence of Farm Equipment	Rs.			92.6
Total Cost	Rs.			29972.7
Gross Income	Rs.			41607.2
Main Product	K.G.	3160.3	12.3	38783.6
By-Product	K.G.	3377.0	0.8	2823.5
Gross profit at farm Gate	Rs.			11634.5
Production Cost per Quintal	Rs.			859.1
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			316.0
Value at Market	K.G.	3002.3	13.0	39112.8
Net Profit	Rs.			11647.7

Appendix 50 : Average production cost and net profit of Wheat, 2010/11

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			41581.3
Human Labour	Day	119.3	143.9	17163.2
Bullock labour	Day	12.4	434.8	5387.5
Tractor Use	Hour	5.1	790.0	4029.0
Pumpset Use	Hour	7.0	300.0	2100.0
Threshern Use	Hour	9.5	214.7	2034.3
Sprayer Use	Hour	7.0	12.0	84.0
Seed	K.G.	123.5	45.5	5615.6
Organic Manure	K.G.	1421.7	0.9	1295.0
Fertilizer	K.G.			
DAP	K.G.	27.5	31.4	862.5
Urea	K.G.	49.1	28.4	1394.9
Potash	K.G.	18.4	18.5	341.3
Plant Protection Chemical used	Rs.			369.5
Others	Rs.			
Interest on Variable Cost	Rs.			904.5
Fixed Cost	Rs.			217.7
Land Tax	Rs.			40.9
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			84.3
Repair and Maintence of Farm Equipment	Rs.			92.5
Total Cost	Rs.			41799.0
Gross Income	Rs.			55452.2
Main Product	K.G.	3144.6	16.7	52644.9
By-Product	K.G.	3328.3	0.8	2807.4
Gross profit at farm Gate	Rs.			13653.2
Production Cost per Quintal	Rs.			1240.0
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			314.5
Value at Market	K.G.	2987.4	18.4	54988.5
Net Profit	Rs.			15682.4

Appendix 51 : Average production cost and net profit of Wheat, 2011/12

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			57834.5
Human Labour	Day	118.7	223.8	26568.8
Bullock labour	Day	14.4	655.8	9458.2
Tractor Use	Hour	5.3	800.0	4266.7
Pumpset Use	Hour			4500.0
Threshern Use	Hour	11.0	100.0	1095.0
Sprayer Use	Hour			
Seed	K.G.	124.2	50.1	6223.9
Organic Manure	K.G.	1446.7	1.0	1435.6
Fertilizer	K.G.			
DAP	K.G.	31.1	32.0	994.8
Urea	K.G.	48.3	29.5	1422.1
Potash	K.G.	20.0	18.5	370.9
Plant Protection Chemical used	Rs.			283.8
Others	Rs.			
Interest on Variable Cost	Rs.			1214.7
Fixed Cost	Rs.			217.5
Land Tax	Rs.			39.0
Water Tax	Rs.			
Deprection of Farm Equipments	Rs.			91.5
Repair and Maintence of Farm Equipment	Rs.			87.0
Total Cost	Rs.			58051.9
Gross Income	Rs.			74502.0
Main Product	K.G.	3105.6	23.0	71456.9
By-Product	K.G.	3298.8	0.9	3045.0
Gross profit at farm Gate	Rs.			16450.0
Production Cost per Quintal	Rs.			1771.2
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			310.6
Value at Market	K.G.	2950.3	24.8	73060.7
Net Profit	Rs.			17743.3

Appendix 52 : Average production cost and net profit of Wheat, 2012/13

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			55907.1
Human Labour	Day	115.1	265.7	30569.4
Bullock labour	Day	8.9	658.3	5881.1
Tractor Use	Hour	5.9	800.0	4720.0
Pumpset Use	Hour	4.5	170.8	768.8
Threshern Use	Hour	9.9	107.3	1063.0
Sprayer Use	Hour	4.1	19.9	82.3
Seed	K.G.	125.3	52.5	6572.3
Organic Manure	K.G.	1273.2	1.0	1273.2
Fertilizer	K.G.			
DAP	K.G.	29.2	50.0	1461.5
Urea	K.G.	49.3	26.0	1282.7
Potash	K.G.	15.5	36.0	558.0
Plant Protection Chemical used	Rs.			381.3
Others	Rs.			
Interest on Variable Cost	Rs.			1293.6
Fixed Cost	Rs.			240.8
Land Tax	Rs.			42.5
Water Tax	Rs.			24.2
Deprecion of Farm Equipments	Rs.			83.3
Repair and Maintence of Farm Equipment	Rs.			90.9
Total Cost	Rs.			56147.9
Gross Income	Rs.			76059.6
Main Product	K.G.	3159.0	23.0	72635.9
By-Product	K.G.	3356.5	1.0	3423.7
Gross profit at farm Gate	Rs.			19911.7
Production Cost per Quintal	Rs.			1669.0
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			315.9
Value at Market	K.G.	3095.8	25.5	79013.6
Net Profit	Rs.			25973.5

Appendix 53 : Average production cost and net profit of Wheat, 2013/14

Particular	Unit	Quantity	price	Values (Rs.)
Average cost of production per hectare				
Variable cost	Rs.			68079.9
Human Labour	Day	90.3	344.0	31069.3
Bullock labour	Day	14.8	644.2	9555.1
Tractor Use	Hour	10.8	763.6	8261.2
Pumpset Use	Hour	3.4	206.1	709.9
Threshern Use	Hour	14.2	293.4	4161.1
Sprayer Use	Hour	5.4	20.8	112.4
Seed	K.G.	125.2	56.3	7054.1
Organic Manure	K.G.	1386.2	1.0	1434.2
Fertilizer	K.G.			
DAP	K.G.	30.2	48.0	1450.0
Urea	K.G.	56.3	22.0	1239.6
Potash	K.G.	17.5	34.0	595.0
Plant Protection Chemical used	Rs.			493.8
Others	Rs.			
Interest on Variable Cost	Rs.			1944.2
Fixed Cost	Rs.			267.3
Land Tax	Rs.			50.6
Water Tax	Rs.			33.8
Deprection of Farm Equipments	Rs.			87.8
Repair and Maintence of Farm Equipment	Rs.			95.1
Total Cost	Rs.			68347.2
Gross Income	Rs.			80938.9
Main Product	K.G.	3646.3	21.1	76860.0
By-Product	K.G.	3828.6	1.1	4079.0
Gross profit at farm Gate	Rs.			12591.7
Production Cost per Quintal	Rs.			1762.6
Marketing at Nearest Wholesale Market				
Marketing Cost	Rs.			875.1
Value at Market	K.G.	3427.5	22.6	77541.3
Net Profit	Rs.			12397.9

