

# **A STUDY OF FISHERY MARKET IN KAILALI**

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## **DECLARATION**

I hereby proclaim that the thesis work entitled A STUDY OF FISHERY MARKET IN KAILALI submitted to Kailali Multiple Campus, Faculty of Management, is my original work done in the form of partial fulfillment of the requirement for the Master's Degree in Business Study (M.B.S.) under the supervision of Associate professor Mr. Padam Kant Joshi, Associate professor Dr. Padam Raj Joshi of Kailali Multiple Campus.

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Researcher

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## **ABBREVIATION**

Ha	=	Hectare
I/NGO	=	International/ National Non- Government Organization
Kg	=	Kilogram
Mt	=	Metric Ton
Rs	=	Nepalese Rupees
UN	=	United Nations
Veg	=	Vegetables
WN	=	Word Number
AD	=	Iswi Sambat
ADBN	=	Agricultural Development Bank of Nepal
ADB	=	Asian Development Bank
BS	=	Bikram Sambat
BR	=	Branch
DHN	=	Dhangadhi
DDC	=	District Development Committee
FG	=	Farmers Group
CP	=	Credit Price
SP	=	Selling Price
GOV.	=	Government
NRB	=	Nepal Rastra Bank
KTM	=	Kathmandu
WTO	=	World trade organization
USD	=	American dollar
RBB	=	Rastriya Baniija bank
NBL	=	Nepal bank ltd
MDB	=	Malika Development Bank
EBL	=	Everest Bank LTD
BOK	=	Bank of Kathmandu
NB Bank	=	Nepal Bangladesh Bank
CBS	=	Central Bureau of Statistics
CEAPRED	=	Centre for Environment and Agricultural Policy

		Research Extension & Development
DADO	=	District Agriculture Development Office
DFOD	=	Development of Fisheries Development
FDC	=	Fisheries Development Center
FAO	=	Food and Agricultural Organization
G	=	Gram
GDP	=	Gross Domestic Product
Go	=	Government Organization

# CHAPTER I

## INTRODUCTION

### 1.1. Back ground

Nepal has common frontiers with the Tibet autonomous region of China in the north and with India in the west, east and south. It is a least developed small, land-locked and mountainous country of 147181 sq. km, and is divided into three physiographic regions, south to north the terai plain, the mid hills and Himalayas, with the population of 25.3 million. Average annual population growth rate is 2.24. It lies on southern side of the Himalayan Mountain between China to the north and India to the south. The geographical location of Nepal lies between 80° to 81°15' east longitude and 28°22' to 29° north latitude. It has covered only 0.03% of total world area. North to south width of country is not uniform, however, the mean width of which is 193 km, and east to west length of the country is 885 km. The entire country is divided in to 14 zones, 75 districts, 5 regions and ecological regions, viz, the mountains, the hills and the Terai from north to south with distinct topographical and climatically features. The mountains (the northernmost strip) cover 15% of geographical area and include 16 districts. The mountains include the world's highest peak, the Mount Everest which is 8848 meter highest. Because of the cold climate and snow- cover almost the year round, this belt is not very suitable for the agriculture. The middle belt, the hills covers 68% of the total area and includes 39 districts. This belt, which consists of high ridges and steep slopes interspersed with many valleys along with the major rivers and rivulets flowing through this belt. The Terai, plain lowland is considered as food basket of country. It covers 17% of total geographic area and consists of 20 districts. One third of the country's population is in absolute poverty. The intensity of poverty is even higher among women and low-cast communities.

Literacy rate is 54.1 percent out of which male are 65.3 percent and female literacy are only 42.8 percent. The majority of population is living in the rural area. Although, agriculture is the main occupations, it could not meet the food demand. Previously we were food exporter, but now have to import. Nepalese economy is predominantly based on agricultural.

Agriculture is the backbone of the Nepalese economy. It is the major source of the livelihood for majority of the country's population. poverty in Nepal is widespread with about 38 percent of the total population living below the poverty line (A level where people are living with less than Re. 4404|- as annual income). The incident of poverty is more severe in the rural (44 percent) and mountain (56 percent) areas. Agriculture still remains the prime occupation for majority (80 percent) of the population in Nepal. The 10<sup>th</sup> plan has a target to reduce the percent level of poverty by 8-percentage point to 30 percent level of the end of plan period (2009). The majority of the population, which is about 85 percent, still lives in the rural areas where agriculture remains the major source of employment and live hood. But the overall performance of this sector could not remain strong. It is quite noteworthy that the agriculture sector share to Gross Domestic Product (GDP) over the last 10 year has significantly declined from 49 to 39 percent. However, the number of labor engaged in agriculture and allied activities has changed little over this period (about 80 percent of employment). This has denoted the low productivity of labor indicating poverty increment in future. Infect, the small size of land holding and fragmentation of land in particular are manly responsible for low agriculture growth (1.75 percent growth rate over the period of 1990-95). More than two third of the total land holdings have less than one hectare of land and they own only 30 percent of the total farm area. The average size of land holding per household in this category is only 0.42 ha. The most part of country's industrial sector is based on agriculture.

Due to the industrialization obstacle the average per capita income is USD 242 only. In spite of huge investment in this sector, the growth rate in agriculture productivity has been unenviable. It grows at an average annual rate of only of 0.4% over the period of 1975 to 1999 A.D. It is necessary to develop industrialization and agriculture sector to get higher per capita income.

Due to the open border with India, it is difficult to inquire complete information on agriculture trade. Nepal has yet to take advantage of improved technology developed in agriculture. In the process of economic development, agriculture development is the pre-condition to provide capital for expansion of other sectors. It provides the food requirement to meet the increase in domestic demand. An increase in the net output of agriculture represents arises in the product of the country. Expansion of agriculture products may be one of the promising means of improving the living standard of 80%

population, who engaged in agriculture. Agriculture, as the dominant sector of an underdeveloped economy, provides raw materials and capital to develop agro-based and agro- services industries in the country. Increased agricultural production is crucial to earn additional foreign exchange by exporting surplus agricultural products. In fact, in the process of economic development of a country like Nepal, any increase in the agricultural productivity helps to sleep up the investment and employment in non-agricultural sector.

Increase in net income of each people tends to rise in the demand for manufactured goods and extend the size of the market. Thus, economic development of Nepal heavily depends on improving the performance of the agricultural sector. Realizing the role of agriculture in economic development plans has placed higher priority upon agricultural program.

## **1.2. Profile of Kailali District**

Kailali district is one of the districts of Seti zone. It lies in Terai belt, which is known as gateway of this region. As this district is like rectangle shape. In this district nearly 80 percent population are involved in agriculture activities while about 20 percent either has jobs are engaged in ethnic or caste occupation. This district is cover near about 3235 sq. km. Out of nine district of the Far Western region Kailali is a Tarai district the fact that, some of its territory also lies in hills. Compared to other district of the region, Kailali is known to be better off in physical infrastructure development. In the west lies Kanchanpur of Mahakali zone, in north Doti, Dadeldhura and Surkhet district, in the east is Bardiya district and in the south of the district lies India`s Utter Pardesh. Despite the fertile sole and a good potential for irrigation, the district languishes minimum irrigation facilities in comparison to other district of Nepal. The agriculture system of the Kailali district is not modern and developed although there is high probability for the expansion and growth the agriculture production of Kailali district.

The Karnali flows in the eastern part of the districts and other major rivers in the district are Mohana, Kanara, Khutiya, Shivaganga, Pathariya, and Kandha etc. There is tremendous potentiality for industrialization in the district, but so far only some rice and oil mills, a sugar factory some crusher has been established here. According

geographical condition, this district consist 40% area lies in Chure and 60% land area in Terai area. The total maximum temperature reaches up to 45°C in May to June, but average temperature is 30.5°C Max. And 17.5°C min. The annual rainfall is 1840mm. It contents tropical, sub-tropical and temperate type of climate and it is situated at the altitude of 109mtrs to 1957mtrs.

The main indigenous people of the district are known to be Chaudhary who constitute about near 45% of population. Other caste and ethnic groups are known to have migrated from different part of country and especially from the far western hill. Despite the huge Tharu population other caste, particularly Brahmen, Chhetri and Thakuri have the access to and the control in resources and other developmental opportunities.

Kailali is known to be better off in physical infrastructure development. So the migration rate is high in this district . The growth rate of population is 3.94%. According to 2068, total population of Kailali is 775709. The population density is 190/km<sup>2</sup> (490/sq.mi). There is 95499-house hold and income per people is Rs. 6424. Literacy rate are 48% (male 59% and female 41%)

Kailali is the food production area. Paddy, wheat, maize, oil seeds are main crops of this district. The main production area of this district is Malwara sector that is Ratanpur, Basouti, Joshapur, Thapapur, Tulchhipur Bhajani, Pratapur, , and Darakh etc. Besides of hilly region, other Terai belt is also plays important role in production.

In this district there are 2 municipalities and 42 village development committees. Dhangadhi, which is the head quarter of Kailali and Tikapur are the municipality. Chuha, Darakh, Dhansingpur, Dododhara, Durgauli, Geta, Godariya, Hasuliya, Joshapur, Janakinagar, Khailad, Kotatulsipur, Lalbojhi Beladivipur, Bhajani, Baliya, Bauniya, Durgauli, Chaumala, , Malakheti, Masuriya, Manuwa, Narayanpur, Pahalmanpur, Pratapur, Phulbari, Pabera, Pathariya, Ramsikharjhala, Ratanpur, Shreepur, Sandepani, Thapapur, Urma, Udasipur v.d.cs are lies in Terai and remaining 7 v.d.cs Godawari, Khairala, Mohanyal, Nigali, Pandoun, Sahajpur and Sugarkhal are hilly village development committe. The situation of Landing of Kailali district are as fallows:-

**Table 1.1: Land Situations of Crops in Kailali District**

S.No.	Crops name	Area in hector
1.	Maize	17500
2.	Wheat	22,500
3.	Paddy	59,500
4.	Others	450

Source: District Agriculture Development Office, Kailali

As shown by above table out of total cultivated area of Kailali district, 17500 hector for maize., 22,500 hector for wheat, 59500 hector is suitable for paddy and 450 hector is for others crops.

The situation of cash crops of Kailali district has been presented in table 1.2.

**Table 1.2 Situations of Cash Crops in Kailali District**

S.No.	Crops name	Area in hector	% of Area
1.	Sugar cane	2,900	5.18
2.	Fruit	1,145	2.13
3.	Potato	2,405	4.44
4.	Pulses	21,752	40.25
5.	Vegetable	2,101	3.89
6.	Spices	535	0.98
7.	Oil seed	22,600	41.45
8.	Other cash crops	126	0.23
9.	Fish keeping	785	1.45
	<b>Total</b>	<b>54349</b>	<b>100</b>

Source: District Agriculture Development Office, Kailali

As shown by above table the main cash crops are sugar cane, fruit, potato, pulses vegetable, spices, oilseed, other cash crops and fish keeping respectively

### **1.3. Profile of Fishery Business in Kailali District**

Kailali is a Terai district in Far Western Development Region is well known district for fish production in this region. In this district there are many ponds, lakes, reservoirs and rivers. Fishes are aquatic animals, which are adapted to live in water. They have streamlined bodies covered by scales. They swim in water with the help of fins. They breathe through gills. They reproduce by laying eggs. They are cold-blooded animals. The Nepalese aquaculture sector has an entirely artesian character; on “*industry*” in its proper sense exists.

The larger private aquaculture farms have pond area of some 5-8 ha but most farmers would operate with considerably less than 1ha. Of ponds. Nevertheless, productivity has improved considerably during the last fifteen years. The average yield per hectare, which was 0.9 tons in 1981/1982, had increased to 1.9 tons/ha in 1995/1996 and 3.2 tons/ha in 2005/05. The large private farms produce 3-5 tons/ha.

Also the capture fisheries rely on artisan catching method. Gill-nets were introduced in the mid-1960s but the main fishing methods continue to make use of cast-nets, traps, hand lift nets, hooks and lines, and loop lines. Traditional canoes or plank boats- developed by fisheries projects are used to operate the gear. Fishermen are usually not organized in co-operatives or larger private companies but operate on an individual bases. Infact, the capture fishery is to large extent subsistence fishing.

The marketing and distribution system is not well structured and fishermen act to some extent as their own sales agents. Moreover, there are a large number of small wholesalers as well as retailers, often operating on foot or by rickshaw in local communities, larger entrepreneurs are involved in trade with Kathamandu and border towns in India. There is no tradition for fish auctioning; there is one auction in Biratnager, in the south, handling some ten tons daily, being the biggest- and probably only- in the country.

There are many types of fish available in Nepal but only following types of fishes are available in Kailali District:-

- ) Common carp
- ) Grass carp
- ) Bighead carp

- ) Silver carp
- ) Rohu
- ) Naini
- ) Bhakur and
- ) Catfish (Pangasius and clarius)

Fingerlings stocking rate of different fishes has been presented in table 1.3

**Table 1.3: Fingerlings Stocking Rate.**

S.No.	Fish caste	Average	Quantity
1	Silver carp	35%	105-123
2	Common carp	35%	75-78
3	Bhaku /Beghead carp	10%	30-35
4	Grass carp	5%	15-18
5	Rohu	15%	45-52
6	Naini	10%	30-35
	<b>Total</b>	<b>100</b>	<b>300-350</b>

Source: DADO Kailali

Similarly, Fingerlings available time has been presented in table 1.4

**Table 1.4 Fingerlings available time**

S.No.	Fish caste	Available time
1	Common carp	Falgun-Baisakh (Feb.- April)
2	Silver carp/ Beghead carp/ Grass carp	Baisakh-Srawan (April-July)
3	Roru/ Naini/ Bhakur	Jestha-Bhadra (May-August)

Source: District Agric lure Development Office, Kailali

Fingerlings of common carp is available in falgun- baisakh (feb-april), silver carp/ beghead carp/ grass carp are available in baisakh-srawan (April-july) and rohu/ naini/ bhakur are available in jestha-bhadra (may-august).

Even though the climate is amazingly different in accordance with the geographical structure in Nepal, the fish unequal temperature and topography has naturally affected

the fish product of Nepal. But in Terai region and some parts of hilly region we can find favorable climate condition for fish production.

Kailali, is a most important district in fish production, from this district fishes are supplied in different part of Western Development Region. so kailali is well known district for fish production in this region. The suitable climate, water supply facilities, different types of technology facilities and available for seasonable fingerlings in this district have made Kailali is the one of the major fish production area. The fish keeping has a lot of scope mainly in Tikapur, Dhangadhi municipality and the area around it. Fish keeping in these parts of Kailali has been highly allured by fish keeping since the fish keeping is easy and cheaply and more advantageous.

The fish keeper say that one can take a lot of profit from each hector of land per year. The financial and output of water supply, technical supports and accessible markets have been on additional for fishponds. Many financial institution play major role by providing financial support in fish cultivation.

#### **1.4. Statement of the Problem**

As stated above, for the development of national economy, agricultural production must be raised. But in Nepal existing agriculture sector is suffered by a low productivity. Many factors are responsible for this low productivity. It is mainly due to subsistence nature of farming, geographical structure and dependency on uncertain monsoon, lack of area-based research, prevailing to traditional farming system and lack of internal inspiration in agricultural sector. It resulted in to the lower crop production and productivity. Contribution of agricultural sector in gross domestic production (GDP) is only about 40 percentages and is in decreasing trend. Lack of proper marketing channel, influence of Indian production, relatively rapid growth in industrial sector, more priority on non agricultural sector, deviation of farm labor to urban area, land tenure problem and inaccessibility of supporting services are also important causes of poor agricultural production.

Agriculture is the predominant sector of Nepalese economy. Due to the absence of the alternative employment opportunities the increasing mass production is depending on agriculture. Although Potato production has facing various problems in its farming sector and marketing sector, the main constraints to the development of the sector

appear to be insufficient knowledge of Potato production among potential producers. There also seems to be a certain lack of improved varieties of Potato seeds, which are needed for it. Moreover, the general problem in Nepal of transportation limits the marketing possibilities of Potato products which most probably also has a blocking effect on the expansion of production unit.

Mainly local communities consume the entire domestic production of fish fresh. Limited amounts of fish are smoked but there are no large scale processing facilities. Generally in Nepal, transportation is constraint for marketing and this is particularly true for a perishable product such as fish; there is a lack of all-weather roads connecting fish producing areas with consumption centers. Moreover, there is no infrastructure in the form of cold storage or insulated vehicles for fish distribution. When transported fish is generally packed in bamboo baskets together with ice and sent by public buses.

Modern harvesting processing and packaging technologies are still new to the small fisheries. The concept of modern fish shop does not exist in Nepal, although the fish market has been increasing slowly. Kailali is the successful area of the fish production. But it has been facing many problems, such as the farmers sell their produce in villages on credit, which may result in not being able to procure fertilizers and pesticides on time, limited access to fingerlings (in terms of size, time and species) hampering the production is poor coordination with DADO and FDC, there are no water quality testing technicians within the project area, and hence farmers are not aware regarding how much of fertilizer, feed, oxygen is required for optimum quality production. The farmers harvest fish well before the harvesting season, leading to them getting underpaid for their product. They harvest well before time because there is demand for fish from the villages all the time. Lack of access to water in Tikapur has hampered the growth of fish leading to loss for the farmers. Poor soil quality and high evaporation rate during dry season has resulted in low water levels. These results in poor growth of fish and the farmers have to work extra hours. These extra hours are substituted from other agricultural farming. There are no traders at the village level; therefore farmers have less economic benefits by not being able to sell the same at markets such as Dhangadhi.

There are no feed makers in the project area, which results in low quality of feed for fish leading to low production in terms of size and weight. Lack of knowledge on-farm nutrient cycles, on farm resources and kitchen wastages resulting in high cost of production. Absence of association leading to poor bargaining power, poor training access, market linkages etc, leading the farmers to sell their produce at lower cost, limited knowledge of available financial services limiting the growth of this enterprise, limited knowledge on fish farming, and inadequate training, this being a new venture, leading to low productivity, lack of observation tour to the well managed ponds.

This leads the farmers not being able to benchmark their enterprise as compared to other farmers. It has also problem of transportation and systematic distribution channels. The efficiency of marketing system depend in availability of market infrastructures such as transportation, storage etc. But in this region, they are not sufficient. In such situation, it is necessary to seek the responses of some question such as: what is the pattern of fish production in kailali district? What is the movement of price of fish produced and sold in kailali district? What is the constraints opportunity for fishery business? This study has been under taken to such the responses of this question.

## **1. 5. Objectives of the Study**

The main objective of the study is to analyze the status of fish production and marketing in Kailali district of Far Western Region and the specific objectives are as given below:

- i) To analyze the trend of fish production in Kailali district.
- ii) To identify the factors affecting the cost of fish production and rate of return on investment.
- iii) To identify the market constraints and opportunity in fishery market.

## **1. 6. Importance of the Study**

Nepalese economy is predominantly agricultural. Agriculture is the backbone of the Nepalese economy and nearly about 40% people belong to the below poverty line. Increased agriculture production and its appropriate marketing system may be one of the promising means of improving the living standard of rural people. But in our country the yield rate of agricultural products have been much lower than advanced countries. This is true in the case of fish also.

The expansion and development of production technology and suitable market is desired for the sake of better standard of living of the masses. In agriculture, cereal crop is the main item that covers paddy, maize, millet, wheat and barley. Oil seed, potato, cotton and tobacco are the cash crop and lentil, chickpea, pigeon pea, black gram, and soybean are the pulses. Cattle, buffaloes, sheep, goat, pigs, fowl and ducks are used in livestock but aquaculture is very much limited in far western region. Aquaculture development has great potential to provide both high protein food and income, generating employment for the rural poor as well as promoting more ecologically balanced use of land water resources. There is a felt need of the promotion of this sector in order to increase Promote the supply of animal protein in the daily diet that will ultimately be helpful in improving the health and the livelihood of small holder farming households in the country. Development of aquaculture in Nepal has been oriented with relatively large pond holdings is well practiced and developed in western part of Terai, through the establishment of aquaculture development project initiated from early 1970s. But the same did not apply in far western and remained far behind in aquaculture development. Aquaculture was given less priority in agriculture but it is considering and attention has been turned to the possible role of aquaculture of poverty alleviation. Small-scale pond aquaculture: The strategy to small-scale aquaculture in resource poor farming system is through pond aquaculture with small-scale irrigation systems. A farm household possessing a treadle pump can be expected to get benefit by construction a small fishpond adjacent to treadle pump with twin objectives pond fish culture as well as a small reservoir for vegetable irrigation. Integrated aquaculture farming systems are enterprise symbiosis maximizing the efficiency of resource use, multidimensional use of space, intensive use of household labor, minimizing cost of production and income risk and enhancing

the quality of the environment as well as means of enhancing income for small land holder farmers.

Rapidly increasing population of Nepal demand for increased fish supply, it is great necessary to balance between population growth and production and marketing of fish. Increased production and suitable marketing of fish can fulfill the increased demand for fish in the country. Thus the importance of fish production and its marketing in the Kailali is stressed by the growing needs of the rapidly increasing population.

There is a need to increase fish production and to expand the marketing to support increased population and many hotels in main city of country. Fish is consumption in huge amount in city and village also, new days; fish is very popular dish of hotels. Due to fish is the importance to study of fish and its marketing.

Wherever there are fish marketing facilities are to be developed in order to make markets available for fish? But the marketing system of fish is not well developed and the producers of fish have not been able to get proper market. That is why fish production is particularly depends upon the interest and mentality of the farmers. Fish is not only suffered the problems of internal markets but also external markets for its export potential. So most of the increased production should consume within the country in such circumstances, some co-coordinated approaches by private as well as institutional agencies have to make to develop the domestic as well as international market for fish.

Develop and strengthen local traders, fish feed maker, water quality testing service provider in Kailali for timely supply of feed, on time water testing and supplying fish from farmers to the market. Facilitate establishment of effective market information mechanism with a focus on fish. Develop and strengthen the capacity of farmers who are interested and are producing fish through trainings for effective management of ponds. Develop and strengthen the input channel, so that the farmer groups have access to row materials such as fingerlings, fertilizers and chemicals, facilitate in establishment of Fisheries Development Office in Kailali.

The report in a logical way highlights the rational for focus on fish keeping, looking at various markets and players therein and their role in the fish keeping, detail

constraints and analysis and potential solution and finally the focus on intervention fish keeping. Fish is often presented as an important source of protein, especially where other sources of animal protein are scarce or expensive.

Fish makes a minor contribution to calorie provision. Fish offers up to 190 calories per capita per day, but reaches such levels only in a few countries where there is a lack of alternative locally produced protein or where a preference for fish has been developed and maintained.

In low-income countries, staple as rice, wheat, maize and cassava make up the bulk of the food consumed by people, supplying the majority of energy and nutrients. However there are some essential micro-nutrients which are not found in these stopples or found only in small quantities- for example: iron, iodine, zinc, calcium, vitamin A and vitamin C. These nutrients must be supplied by other food such as fish or vegetables. Fish is particularly rich in these micronutrients. Fish are also an important source of fatty acids that are necessary for the development of the brain and body. The importance of fish as a crucial element in the diet of a population.

Nepal is technically sound for fish production, it possesses a large number of rivers with a perennial supply of water from melting snow from the Himalayas, a considerable amount of smaller lakes as well as a large number of reservoirs, existing or expected to be constructed under many hydro-power projects. Moreover, there is a vast amount of ponds and irrigated paddy field suitable for fish farming. Most of these water resources are currently largely under-utilized. Hence, it can be concluded that there is an important potential for development of aquaculture. The significant increase in output during various aquaculture projects confirms this view

## 1.7 Limitation of the Study

The data have maintained was provided by the farmer, consumer, fish byapari and some are downloaded from the internet, office record, annual reports and even different newspapers were taken while preparing the report. Though there have been efforts to mitigate limitations during the course of the study, certain factors have been highlighted for future references while conducting similar studies.

This study has been broken out with some precise limitations and mainly they are as below:

- i) This study is based on only 5 years data.
- ii) The study is based on sample study of Dhangadhi municipality and some Village Development Committee, fisheries, fishpond and fishermen are available, which may or may not represent the whole district.
- iii) The study is general to be confined on the production and marketing of fish.
- iv) Limited area for collecting primary data with limited consumer fishermen and fish byapari. Little information has been collected from secondary data.

## 1. 8. Organization of the Study

The present study, "A study of fishery marketing in Kailali district" is organized in to five chapters. A brief textual outline of each of the six chapters is depicted bellow;

Chapter	I	Introduction
Chapter	II	Review of literature
Chapter	III	Methodology
Chapter	IV	Presentation and analysis of data
Chapter	V	Summery, conclusion and recommendations

## **CHAPTER II**

### **REVIEW OF LITERATURE**

The previous chapter highlighted the concept, problems, objectives and focus of the study. This chapter, review of literature is the theoretical framework that provides the bases and inputs for this study purpose. It helps achieve clarity in the discussion that follows and guides to adopt the precise study.

This thesis is mainly based on the field of fishery market in Kailali. Nepal almost completely being an agricultural country, overall development of country has been developing upon agriculture. According to Lewts, “If agriculture is stagnate, it offers only a stagnate market and inhibits the growth of the economy” therefore agriculture sector is precondition for the smooth development of industries of the country. In Nepal the modernization process of agriculture through government efforts can be traced back to 1921 AD. The first agricultural office was opened in “Charkhal Adda”. The more organized efforts were made only after 1955 AD, with the introduction of the first five years plan in the country.

Thus the agricultural sector in the emerging countries of the world plays a substantial role in building up their national economics entangled in to the vicious circle of poverty. Agriculture has to play the cost of development of the over all economy. There is no other sector except agriculture to meet the entire financial need for progress in the initial phase of economic development. It is easier for developing nations of economic development by means of agriculture than industries because, “Agriculture development required comparatively less capital than many large scale manufacturing industries for simple reason of lower capital output ratio in the farmer. This implies that the income generated by investment made in agriculture is comparatively higher and difference between the amount invested bank in agriculture out of the income generated and the amount that remains as saving can be utilized for the expansion and promotion of the non-agricultural sectors.

Agriculture was supposed to be the main factor of economic development two centuries ago too. Adam Smith also said, “Almost two centuries ago that agricultural output in its widest sense is the basic working capital of nation in its initial stage of its growth.” Not only in the initial stage but also in all stages of development, agriculture

plays a vital role. D.N. Jha in his book, "*planning and agricultural development*" says, "It is obvious that the development of agriculture can help in the development of economy from a stagnant to progressive stage in various ways like increasing gross national product by supplying the physical surplus required by other sectors of the economy in the shape of tools and raw materials and by providing the economic surplus which constitutes the materials basis for economic development."

In an economy like ours where more than 60% national income still comes from agriculture sector, a large part of surplus required for economic development may be expected to come from agriculture until the stage is reached when industry is able to contribute a major part of national income. Coal and Hoover also says that, "Very substantial progress in the most backward part of the economy agriculture is a prerequisite to successful development as a whole and that if one sector unites the growth of the other, it is more likely to be a case of agricultural growth limiting non agriculture than vice versa."

Since there is scope for rising productivity in agriculture by means that required only moderate capital outlays, it is possible for the agriculture sector to make a net contribution to the capital requirement for infrastructure and for industrial expansion without reducing the low levels of consumption characteristics of farm population in an underdeveloped economy." So the developing national must place top priority upon the improvement and expansion of its agriculture.

After the World War 2<sup>nd</sup> economists in advanced and UDC countries have tried to show the importance of agriculture much more vividly and practically. Lewis's *Theory of growth and Nurksian (or unemployment)* is the most notes worthy. It shows that there exists disguised unemployment in the rural sector and the portion of surplus labor whose marginal productivity is zero or negative may be easily signed off from this sector to other industries without disturbing the productivity.

Letter on various economists including **Gustes Rains** and **C.H. Feis** with the emphasis on the technological change in agriculture have also high lightened the idea of saving potential from rural sector.

Schultz to Quote, “There is no longer any room for doubt whether agriculture can be a powerful engine to growth” and goes on to write if efficient incentive and investment opportunities are granted “Farmers have the power to turn sand in to gold.”

In the context to agricultural development **Y.P. Pant** in his book stated that agricultural development is only possible through integrated approach. He stated that agriculture with an integrated approach should remain for many years to come a first priority in our national planning efforts.

Today Fisheries are as a safety-net activity for the poor farmers in Nepal. Agriculture productivity of Nepal has been depressed over a long period due to the existence of traditional method of agriculture. In agriculture development in Nepal, “**Y.P. Pant and S.C. Jain** pointed out that one of the main problems in Nepalese agriculture is its low productivity.” B.P. Shrestha and S.C. Jain in “Regional Development in Nepal an exercise in Reality” drawn a special attention on the problem of low productivity on small scale agricultural followed by under employment and consequence priority of masses a stigma in the way of agricultural progress can be tackled only by a policy of specialization and diversification of production activity without efficient agro-ecological and agro-climate regions.

Many sectors are responsible for low productivity in agriculture sector. The Human Development Report, in a discussion of poverty and human development, reasons that poverty is the opportunities and choices that are denied for basic human development to land a long, healthy, creative life and the respect of others.

Dr. Hari Dahal in his article entitled, “Agriculture prospective plan and farm credit distribution pattern in Nepal” present contribution of agriculture perspective plan (APP) in the field of poverty reduction and agriculture growth. Dr. Dahal mentions that agriculture is the engine of economic growth of Nepal. He expresses that APP has been undertaking the major objective to reduce the poverty percentage from 49 to 14 by the end of the plan period by creating the employment in agricultural and its allied activities. Further, he highlights that fertilizer, irrigation, technology, road and electricity are the major input priorities areas of APP while livestock, high value commodities, agribusiness and forestry are major outputs of APP. Dr. Dahal mentions that strong correlation upholds between adequate and timely available of farm credit

and agriculture growth. Considering such prime importance of credit in agriculture growth and poverty reduction, he suggests to expand credit in technically feasible commodities in remote and poverty-stricken districts.

Farmers are producers of fish who produce fully or partially for markets. They have to decide their produce for sale i.e. where to sell, when to sell, what to sell, and how to sell. More encouragement for increase in production without organizing marketing system will have a harmful effect, in “marketing of farm products”. Dr. Puspa Ram Mathema stressed that farm products do not reach the consumers directly in absence of marketing services. This was a common belief that the marketing system will come up along with improvement in production in the developing countries. But in Nepal agriculture programs have received a very little place. That is why the marketing system is less developed in Nepal.

“*Agriculture Marketing Conference*” stressed on the weaknesses in the Nepalese agricultural marketing system, there is no national market that effects to the increase in the size of domestic market. Marketing infrastructures such as transportation, communication system, grading and standardization and marketing lows are far from adequate.

A study titled “Marketing efficiency in Indian agriculture” by Jasdanwalla, Z.Y. published in 1966 mentioned that one of important functions of prices, in general, is to guide and direct production, to ensure that movements in production occur in consonance with consumer demand and thud to avoid a misallocation of resource.

Although small-scale fisheries may contribute to poverty reduction at the household level, it should be recognized that at the present time the most important contribution of small-scale fisheries to poverty alleviation is poverty through their role in poverty prevention. Indeed, experience suggests that for the large majority of household involved in fishing activities (full-time, temporary or occasional fishers) in developing countries, fishing and related activities have not generated high economic return but instead have helped them to sustain their livelihoods and have prevented them from falling deeper in to deprivation.

Small-scale fisheries can also provide a critical safety net for vulnerable (even those which were not previously poor) when they face a sudden decline in their income.

This can happen, for example, when the head of a household loses his or her life/job; or if from crops fail; or, on a larger scale, when the local or even national economy deteriorates. Recurrent civil wars or military conflicts, population displacement, and natural disasters also create circumstances where those effected turn to fisheries as additional or alternative sources of income, food or employment.

A recent **FAO/ECAFE meeting** analyzed in detail effects on production of the fixing of guarantee minimum or procurement price in Far East countries, since expecting **Ceylon and Japan** these policies have been aimed principally at protecting the interest of non-farm consumers. Their impact on farmer has been largely incidental but the incidental effect where important. On the one hand it appeared that price policies for industrial or cash crops had sometime stimulated a shift away from food grain. On the other hand low procurement prices coupled with compulsory purchase apparently handicapped development of food grain in production in some countries.

Whether develop or developing, any country which produce or consumers a sizeable quality of fish requires a government pricing policy for fish keeping, because of their importance in the national economy. Basically the aims of such of policy should be similar in developed and developing countries, in that the interest of the consumer as well as the producer must be given attention. For the producer, the policy should seek to ensure that the price he obtains does not fall below a certain level. For the consumers, the policy should risk to ensure that the price he pays is within his reach. Such a pricing policies however, appears to be an attempt to reconcile two irreconcilable interests.

C.Y. Lee has best point out the general and the characteristic problem of Nepal agricultural marketing on “Agricultural Marketing System in Nepal.” He points the problem as due to the lack of national market and infrastructure the losses in the distribution, small volume of unit transaction, in sufficient cultivation of potential demand and lack of co-ordination among the various supporting agencies. Lack of modern transportation network covering the country and lack of efficient information dissemination system has largely caused to the isolation of the marketing as per the geographical regions. Similarly losses in terms of physical quality during the distribution are associated with the lack of proper handling practices and processing methods.

Mr. Kenishi Ohachi in his article entitled “irrigation in Nepal”. Thinking beyond the green revolution presents the four major components viz; irrigation, rural electrification and rural road should follow in integrated way. On the way of presenting his idea, he suggests that ground water irrigation scheme is more suitable in Terai than capital-intensive surface irrigation scheme (take longer time to construct). In the mean time, he also expresses that shallow tube-wells are quite affordable to many farmers, especially if electric pumps can be used. In order to promote agriculture in hills, he further suggests adopting small-scale irrigation schemes with relatively short canals to reduce the vulnerability of landslides.

Mr. Prem Bahadur Shrestha in his article entitled, “Strategic Approach to new Product Development” presents prime role of integrated product development (IPD) practice including strategic integration, functional integration and logistic integration. Mr. Shrestha has mentioned that the major objective of product design are intended to fulfill the customer needs, deliver the products at a competitive price and time to market to pricing the products intervention earlier than the competitions. Mr. Shrestha clearly mentions about the product development process such as idea generation, screening, developing and finalizing concept and product intervention mechanisms. In addition he highlights some major component i.e. cost, quality, reliability, time to market and innovativeness need to be considered at the time of product design. Finally, Mr. Shrestha emphasizes to assess strengths and weaknesses of institution by focusing on the “gap” between present and future destination. He suggests that gap analysis must be focused to be best opportunities that would give highest returns.

**Prof. Yunus** in his Nobel lecture on 10<sup>th</sup> December 2006 declared that poverty is threat to peace. He said, “Norwegian Nobel Committee has given important support to the proposition that peace is inextricably linked to poverty. Poverty is a threat to peace. World’s income distribution gives a very telling story. Ninety four percent of the world income goes to 40 percent of the population while 60 percent of people live on only 6 percent of world income. Half of the world population lives on two dollars a day. Over one billion people live on less than a dollar a day. This is no formula for peace.

The new millennium began with a great global dream. World leaders gathered at the United Nations in 2000 and adopted, among others, a historic goal to reduce poverty

by half by 2015. Never in human history had such a bold goal been adopted by the entire world in one voice, one that specified time and size. But then came September 11 and the Iraq war, and suddenly the world became derailed from the pursuit of this dream, with the attention of world leaders shifting from the war on poverty to the war on terrorism. Till now over \$ 530 billion has been spent on the war in Iraq by the USA alone.

I believe terrorism cannot be won over by military action. Terrorism must be condemned in the strongest language. We must stand solidly against it, and find all means to end it. We must address the root causes of terrorism to end it for all time to come. I believe that putting resources in to improving the lives of the poor people is a better strategy than spending it on guns.”

A study titled, the 2002 United Nations (UN) World Summit on Sustainable Development (WSSD), The 2000 world development Report published by the World Bank, the UN millennium declaration adopted in 2000, and the FAO world food summit, all considered poverty alleviation as a central priority.

Globally more than one billion people are living on less than US\$ 1 a day and 840 million people remain classified as undernourished (FAO 2005 Technical Guidelines of Responsible Fisheries). As result, in recent years there has been a re- focusing on poverty and food security by many non-governmental organization (NGOs), academies, development practitioner, governments, and donor agencies. With regard to food security, at an international conference on the sustainable contribution of fisheries to food supply held in Kyoto, Japan in 1995, the 95 participating states approved a declaration and a plan of action to enhance the contribution of fisheries to human food supply. The 1996 world food summit stressed the connection between food security and the need for sustainable management of natural resources.

**John W. Mellor's** opinion is that there must be an agricultural development in order to provide food and fiber for an expanding population with rising purchasing power. Capital including foreign exchange for economic transformation and a direct increase in rural welfare to sum up agriculture is a supplier of resources and corner and saver of foreign exchange.

Food security is a basic aspect of poverty. People who are persistently poor usually lack access to adequate food. Malnutrition negatively affects people's working and learning capacity, and many affect vulnerable groups living just above the poverty threshold, causing them to enter the ranks of the poor. Eliminating hunger and malnutrition, therefore, is a prerequisite for the eradication of poverty.

Promotion of small fisheries among the poor contribute higher income compared to other conventional crops, and hence, the poor have better food security, which eventually has positive impacts on the national economy.

The most direct contribution of fishing activity to food security at the household level is through self-consumption. Certainly for many households engaged in full-time, seasonal or occasional small-scale fishing activities, such contributions are crucial to individual/household food security.

The percentage of total household catch that is consumed by the household varies greatly, however, and may depend on both the level of commercialization in the fishery and the level of poverty in the household.

Another study titled the Pacific island nations have increasingly realized the role aquaculture can play to supply fish protein, particularly for inland rural villages where access to fresh fish is limited and lack of electricity does not allow the long-term storage of food. Some parts of the Pacific, particularly the large Melanesian countries are facing a food crisis situation from increasing population pressure, which is leading to poor nutrition and health. Generating another primary food source would help alleviate the reliance on imported processed i.e. tinned, foods. Aquaculture is also seen as a viable alternative source of essential cash needs (for school fees, social obligations and other expenditure items) and as a backstop to declining fisheries revenue and is also being integrated into tourism marketing campaigns.

There are examples where aquaculture has helped particularly vulnerable groups. For example, throughout sub-Saharan Africa small-scale fishponds offer a valuable addition to the integrated farming systems without substantially adding to the labour burden, hence contributing to food security and improved nutrition at the family level. It has also been reported that fish farming may serve as a low labour solution for HIV/AIDS affected households.

A study of Haylor and Bland, aquaculture development has been credited with stimulating the development of the rural communities in which they are located by direct employment of residents, and the generation of greater economic activity with the establishment of support services aquaculture development brings with it an infusion of cash to areas which may not merit consideration for other types of industry. Wages for local labour become part of the local economy as they are used to pay for local goods and services. Commercial-scale investment also spurs the government to provide or improve the infrastructures of an isolated area in the form of roads, bridges and often electricity.

The global fish trade was worth US\$ 63 billion in 2003 and Asia accounts for US\$ 20 billion. Over 40% of fish production is traded across borders and exports exceed that of meat, dairy, cereals, sugar and coffee. Much of the traded fish and fish products are from aquaculture, which is practiced almost entirely in rural areas and concentrated in developing countries. Thus trade presents an opportunity to help rural communities, governments, however, do not appear to exploit fully the opportunity that this scenario for rural development.

A study of FAO, fish has always been recognized as a cheap source of animal protein. Countries with low per capita gross domestic product tend to have a higher proportion of fish protein in their animal protein consumption. Although less developed countries are not the biggest consumers of fish, they are the most dependent on it. The share of fish protein as a proportion of total expenditure on animal protein is higher for lower income groups, and poor people consume mostly low priced fish. This shows the importance of low-priced fish as a primary source of protein among poor households in developing countries-although in many cases this low-cost fish is derived from inland capture fisheries. When inland capture fisheries decline aquaculture increasingly makes up for the gap and even starts to fill the increasing demands from increasing populations. This suggests that freshwater aquaculture plays a significant role in the growth in capital fish consumption and in keeping fish prices stable and at least as likely to be on the table as meat from livestock and poultry.

Growing demand and expanding markets are expected to push fish prices up, hence the need to increase the supply of low-value food fish to keep the price within the reach of the rural and urban poor. Semi-intensive and primary production-based

aquaculture (includes culture-based fisheries) of low-value food fish has the potential to be adopted by millions of smallholders in Asia Developing Countries and is well established in several countries in Asia. It has emerged as an environmentally friendly production system that also supplies large quantities of low-value food fish. However, in the increasingly competitive markets of today there are strong economic incentives for farmers to shift to higher value fish crops that yield higher profit margins.

A study of Asian Development Bank, fish farming has evidently supported the creation of wealth in many countries. Commercial, industrial aquaculture of course operates as a business with maximizing profits in mind. This scenario is worldwide. There are documented examples of wealth creation or income generation through small-scale aquaculture in developing countries.

An evaluation of freshwater rural aquaculture projects in Bangladesh, Philippines and Thailand by the Asian Development Bank provides good examples of the positive social impacts of aquaculture that include accumulation of capital. Fish farming households in a large district of 2.5 million people in Bangladesh “overwhelmingly perceived” that

- i) Their overall food and fish consumption had improved,
- ii) They gained from employment and cash incomes from fish farming,
- iii) The natural resource conditions for fish farming had improved,
- iv) They had acquired means to finance fish farming,
- v) Their housing conditions had improved,
- vi) They had gained access to fish farming technology,
- vii) There had been an increase in the adoption of fish farming technology, and
- viii) Their access to credit had improved.

Agriculture credit is most important for food production and its marketing. However, ADBN plays the most important role in rural agriculture credit. Asian Development Bank appraised the “Fifth Agricultural Credit Project in Nepal” in 1987 AD. That leveled some conclusions ADBN involves directly and indirectly in agricultural development by providing financial and technical support. About 90% of all credit to agriculture (including agro-based industries) is provided by ADBN. During the past

15 years, ADBN has played a pioneering and central role in encouraging development initiatives by the farming community and disseminating new and viable technologies for farm and rural development. Nepal has been providing more emphasis to agriculture beginning of its planning stage. In every fifth year plan, agriculture sector occupies first priority in its development budget. In this 10<sup>th</sup> fifth year plan, agriculture occupies first priority also.

This plan has defined some objectives for agriculture development as follows.

- i) To increase the production and productivity of agriculture sector.
- ii) Increase in permanent production with the help of replication of technology, research and development by balancing in environment.
- iii) Promoting the agricultural based industries and business and promoting external market development and export.

“A study of rice marketing of Kailali district” carried by **Mr. Bhupendra Bdr. Balayar on 2068 A.D.** in the following objectives.

- To study the present situation of rice marketing in Kailali district.
- To study the historical background of rice marketing in Kailali district.
- To analyze the promotional activities and distribution channels of rice in Kailali district. To study the price situation of rice in the market of Kailali district
- To investigate the market possibilities of rice.
- To suggest for the rice market in Kailali district.

A dissertation titled “A study on banana marketing in Kailali district carried by Mr. Mahendra Rawal on 2066 B.S. in the following objectives:-

- To study the present situation of banana market in Kailali district.
- To analyze the existing marketing situation of banana in Kailali district.
- To analyze the promotional activities and distribution channels of banana in Kailali district.

- To study the price situation of banana market of Kailali district, Nepalgunj and Kathmandu.
- To investigate the market possibility of banana.

The major findings of the study are:-

1. In Kailali district, there is some lack of knowledge to the farmers. Farmers are attracted to earn more profit from banana farming without technical knowledge. In order to get good production of banana, regular maturing is necessary operation. There is only one person Mr. Kalu Hamal who has directly or indirectly provides technical knowledge to the various banana farmers. But he has not enough time to observe all banana cultivation. The government has been given due attention to the banana farming in technical aspect in this areas.
2. The lack of irrigation facilities, the farming of fruits depend on the seasonal irrigation by channel. Some farmers have irrigated by boring (Pump set). But this method of irrigation is very costly for banana farming.
3. Financial supporting services program is also lacking there. Especially the Agriculture Development Bank is responsible to provide the loan for banana production. It provides the loan Rs, 96000 per Bigaha in 15% to the banana cultivation. Agriculture Development Bank 60%, Nawajeevan Bank 7% and Malika Development Bank 3% investment in total banana cultivation and 1114.90% of investment in banana farming by banana farmers themselves. Farmers cannot achieve the expected loans easily and quickly.
4. There is less co-ordination between farmers. There is only one origination (Kerabari Bikash Samuha) of banana farmers.
5. The variety of banana like Robusta, Cavies and Malbhog etc. are not cultivated there.
6. The total area of banana cultivation is 103 Bigha and 15 Katha till October 2011. And total annual production will be 12, 45,000 dozen of bananas in one-year-period.

7. In that area, special packing is not done neither it requires. There are not using any special containers for packing.
8. The scientific storage facilities are completely lacking here. All of the farmers use local method of storage. Farmer's store the banana in the ground floor and hang the bunches meanwhile some farmers send the banana directly to the market from the field.
9. The channel system is very simple and not well developed. The channel for the local or nearby market comprise of the growers who sell directly to the customers by taking them to the field itself.
10. According to the respondent 80% of the farmers are educated so that they can acquire technical knowledge in rice farming.
11. The banana farmers give attention to the quality of banana production in that area. They are given to consideration only about the quantity of banana production in present.
12. There are not any research activities done about marketing situation by banana growers. Growers are not feeling marketing problems in present by the problem of marketing situations will come in future.

A dissertation titled "A study of Potato marketing in Kailali district carried by Mr. Ramjee Bagale on.2061-062 B.S. in the following objectives & finding:-

- i. To analyze the patterns of Potato production in Kailali district.
- ii. To identify the fluctuation in the price of Potato in the selected area.
- iii. To identify the market constraints and opportunities in relation to the establishment of viable enterprises relating to the Potato production including to export.
- iv. To study the present situation of the Potato marketing in different parts of Kailali district.
- v. To investigate the market possibilities of potato.

- vi. To suggest relevant strategy for promotion of Potato marketing business in Kailali.

The major findings of the study are:-

1. Most of the people are dependent on agriculture in Kailali district.
2. Terai area is suitable for potato production. Terai sector is the main production area of this district.
3. Different bank branches are located in different parts of this district.. It is also found from survey that 95% of the total institutional loan is served by ADBN. Big Potato traders have been taking loan from joint venture bank that is below 5% in quantity.
4. The yield rate of potato production in Kailali is increasing.
5. DADO has recommended many types of Potato in Kailali district.
6. Quality improved Potato breeds are made available by DADO Kailali and various agro vests but it is not sufficient of make reachable to the rural farmers.
7. Farmers are not trained about fertilizers, modern agricultural cultivation system and their argument is “They are left Away from the help of government service”
8. Due to low saving because of little sources of income farmers can’t adopt improved method of farming.
9. Some farmer borrow from local merchant, others from financial institution and few of the farmers use their own capital
10. 40 Percentage of total production is destroyed by many kinds of disease.
11. Dhangadhi, Attariya, Chaumala, Pahalwanpur, Lamki, Tikapur, Narayanpur etc are main market point of Potato trade.

12. The price of Potato is higher in off season than season. The price of Potato is increasing every year.
13. Cycle is heavily used as the means of transportation of Potato all over the district. In local area, bull cart is used. In city area rickshaw are using but truck and jeep for supplying other district.
14. Maximum transportation cost is Rs25 per quintal in this district.
15. Marketing environment of Kailali is mainly effected by India.
16. The Potato market coverage of Kailali is defined as local market coverage and district market coverage.
17. Potato is supplied into different parts of Far Western Development Region.
18. Storage facility is low in farmer sector. If they have that is traditional style. So they are obliged to sell Potato in the market in low price. Potato may be damaged quickly.

No modern concept is used for product decisions and promotions. They sell with their direct relation. Simply telephone is used.

## **CHAPTER III**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

Research methodology is the process of arriving at the solution of problems through a planned and systematic dealing with the collection, analysis and interpretation of the facts and figure. In simple words, research methodology refers to the various sequential steps to be adopted by a researcher in studying a problem, with certain objectives in view. It may be understood as a science of studying new research is done significantly. It is necessary for the researcher to know not only the research methods/techniques but also the methodology. Researchers not only need to know how to develop certain indices on tests, how to calculated the mean, the mode, the research techniques, but they also need to know which of these methods or techniques are relevant and which are not, and what would they mean and indicate and why. Methodology is the science of method. It is a body of methods used in a particular branch of activity.

The topic of the problem has been selected as fishery market in Kailali. This chapter presents the methodology of this study. The main objectives of this study is to, analyze and investigate about fish production and it's marketing in Kailali. The research methodology employed in the present study is described in this chapter.

#### **3.2. Research Design**

The objective of the study is to highlight the fishery market in Kailali district. It is a systematic activity to achieve truth or finding solution to a problem. It consists of collecting data, analyzing data and finding the conclusion, which helps, in decision-making process. Research is thus, analysis and synthesis of data. A research design is the logical and systematic planning and directing of a piece of research. According to Seitz, Jahoda, Deutsch and Cook, "A research design is the arrangement of condition for collection and analysis of data in a manner that aims to combine relevance to the

research purpose with economy in procedure”. The research has been designed according to the objective of the study.

The required data are collected by conducting field survey and some data from government office, institutes and NGOs. For the fulfillment of the objectives of the study data are collected from fish producers, Fishermen, Fish Byapari and final consumers. They are selected using random sampling technique.

### **3.3. Population and Sample**

The population of this study consists of all the buyers and consumers above 18 years age group. Sampling is the practice of selecting group of consumers/objects considered to be representative of the entire population, because it is neither feasible nor practical for a research to contact all the members of a population. In Kailali there are only 915 fish keeping ponds. Out of them 800 fish keeping ponds are related to fish business. Only near about 5% of them are randomly selected for data collection. There are many small sizes of fish Byapari in the district. They are also randomly selected for collecting data. Data are collected from fishermen; fish Byapari of Masuriya, Pahalmanpur, Lamki, Chisapani, Tikapur, Dhangadhi, Geta, Attariya, chaumala and Satti. To fulfill the purpose, some data are collected from farmers and final consumers to support this study.

### **3.4. Sources of data**

The present study is basically conducted on secondary data and there is less use of primary data. Depending on the nature of data and information following sources have been utilized. According to Horace Secrests, 1933 “Statistics are ‘aggregates of fact’, affected to a marked, extent by a multiplicity of causes, numerically expressed enumerated or estimated according to a reasonable standard accuracy, collected in systematic manner for a predetermined purpose and place in relation to each other.” For the effective survey, two types of data are collected.

### **a) Primary Data**

The important sources of primary data are opinion survey through questionnaire and interview, field visit, and mailing information of the respondents. Primary data are collected from fish producers, fishermen; fish Byapari and final consumers.

### **b) Secondary Data**

Secondary data are collected from relevant books, journals, bulletins, magazines, newspapers annual report, unpublished and published thesis, internet etc.

## **3.5 Collection and analysis of Data**

Primary data are collected from questionnaire and interview. Secondary data have been are collected different published local sources. To get the required information after completing the interview and questionnaire with the related parties, data are compiled and arranged in required tabular form with help of computer and calculator.

## **3.6. Method of Data Analysis**

Data, which are collected, are analyzed by using statistical and non-statistical tools. Descriptive method is also widely used. Related information is presented in the tables as well as bars and graphs. Statistical tools have been used where necessary. All the analysis is made on the basis of the data as presented in different tables.

## **CHAPTER IV**

### **PRESENTATION AND ANALYSIS OF DATA**

#### **4.1. Introduction**

This thesis is mainly based on the field of fishery market in Kailali. Nepal almost completely being an agricultural country; overall development of country has been developing upon agriculture. From prehistoric times, fishing has been a major source of food for people a provider of employment and economic benefits to those engaged in this activity. However, with the advent of time and the dynamic development of fisheries aquatic resources, are not infinite and need to be properly administered, if their contribution to the nutritional, economic and social well being of the growing world's population was to be sustained.

Fish is an important source of dietary protein, micronutrients and essential fatty acids for millions of the world's poor and contributes to their caloric intake. Although many small-scale fishing communities are poor and vulnerable, it is now widely acknowledged that small-scale fisheries can generate significant profits, prove resilient to shocks and crises, and make meaningful contributions to poverty alleviation and food security. In addition, while small-scale fisheries may generate only marginal profit levels, in some cases small-scale fisheries can have significant comparative advantages over big commercial fisheries in terms of:

- i) Greater economic efficiency;
- ii) Fewer negative impacts of the environment;
- iii) The fact they are decentralized and geographically spread out and therefore have the ability to share economic and social benefits more widely; and
- iv) Their contribution to cultural heritage.

#### **4.2. Trend of Fish Production in Nepal**

In Nepal fish come from pond and cage culture, as well as from capture fisheries. The total fish production increased from 3530 t in 1981-82 to 21,879 t in 1995-96. During the same period fish production from capture fishery increased from 2780 t to 11,230.

Much of this increase came from the irrigated paddy fields, wetlands, lakes and reservoirs, while capture from rivers has stagnated since 1986/87. Pond production in warm waters has doubled over the period 1986/87 to 1995/96..

There is not long history of aquaculture in Nepal. It first started from mid- 1950s. on a very small scale with imports of fish seed from India in the However, further development only begun in the 1960s.and more significant progress was first seen as from the early 1970s. Various fish species have been imported from abroad over the years and some indigenous carps have also been introduced for farming. At present seven commercially valuable carp species are bread and cultured in the country. These include the three indigenous species Rohu (*Labeo Rohita*), Naini (*Cirrhinus Mrigala*) and Bhakur (*Calta Calta*). The remaining four are exotic species; common carp (*Cyprinus Carpio*), Silver carp (*Hypophthalmichthys Molitrix*), Bighead carp (*Aristichthys Nobicis*) and Grass carp (*Ctenopharyngoden Idella*). Pods polyculture of the above cited carp species is by far the most common aquaculture system and contributed 90% of the total production of some 10600 tones is 1995/96. The lion part of the production take place in the southern part of the country; 94% of all ponds which are mainly smaller village ponds are situated on the Terai plain.

In early 1970s Cage fish culture of carp was introduced in the lakes of the Pokhara valley as a fish holding program. However, at present cage culture is only undertaken in an extensive form even though studies are currently being undertaken for developing more intensive systems with supplementary feeding of common carp. Open water stocking of carp seed has recently increased the production by local fisher folk communities and is reported to have contributed some 130 tones to production is 1995/96. In spite of its potential fish-cum-rice culture has not taken off in Nepal.

The culture, which is practiced in the mid-hills and valleys, only contributed 42 tones in 1998. Culture of high-value cold water species in particular rainbow trout has been ongoing for some years with assistance from Japan. The technical viability has been proven but the culture has not yet been introduced on a commercial scale.

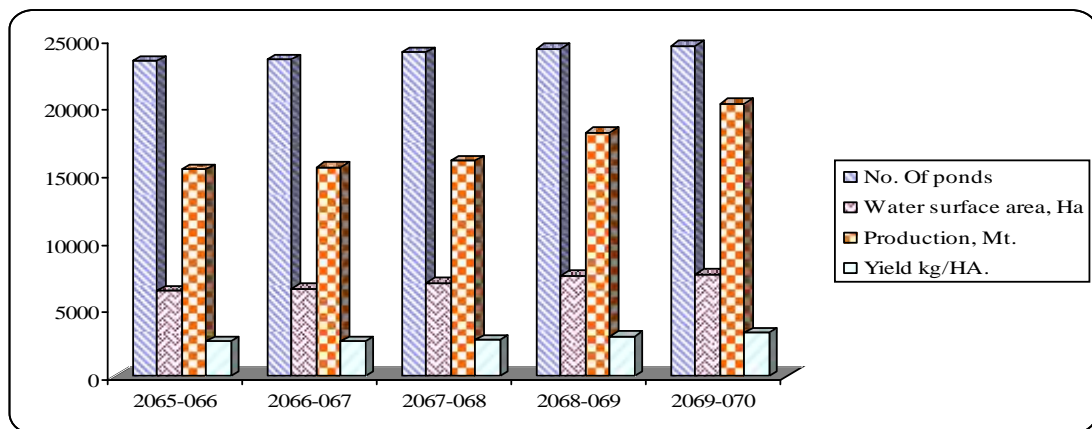
**Table 4.1 Yearly production of pond fish in Nepal**

Year	No. Of ponds	Water surface Area, Ha	Production, Mt.	Yield kg/HA.	% Increment on yield
2065-066	23400	6325	15320	2577	-
2066-067	23500	6525	15516	2606	1.13%
2067-068	24000	6925	16000	2672	2.53%
2068-069	24302	7485	18060	2964	10.93%
2069-070	24525	7558	20213	3250	9.65%

Source: Statistical Information on Nepalese Agriculture, 2069-070

The table shows that there has been an increment in number of ponds in Nepal along with increase in production and yield per hectare. This increment in production and yield per hectare is because of easier access to inputs, access to better technologies and infrastructure and positive support from I/NGOs and Government organizations. The increment in yield/hectare shows the potentiality of this sub sector not only for livelihood support but also for increase in income generation.

**Fig. 4.1 Yearly production of pond fish in Nepal**



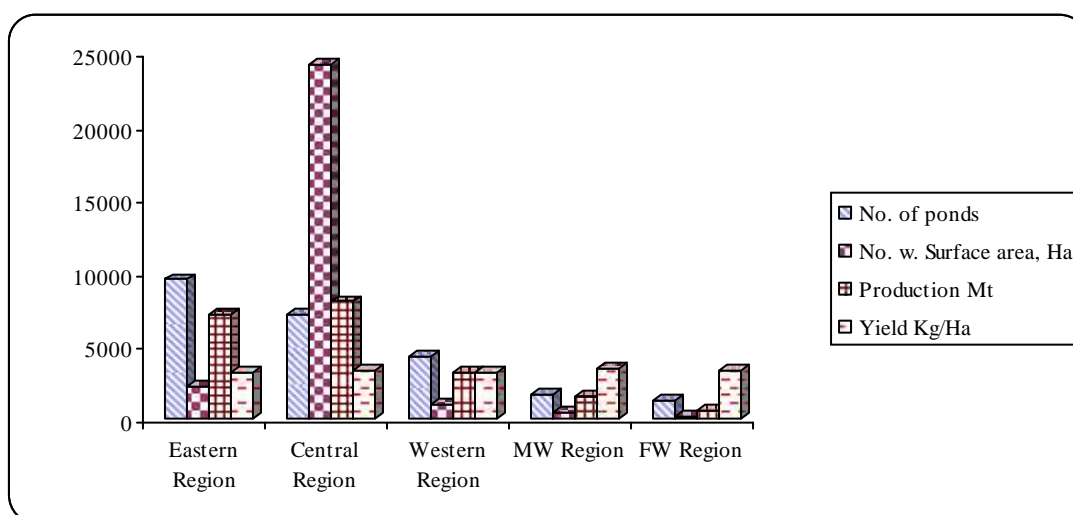
**Table 4.2 Regional wise Comparisons of Fish Production in Nepal**

Region	No. of ponds	No. w. Surface area, Ha	Production Mt	Yield Kg/Ha
Eastern Region	9500	2117.7	7070.25	3395
Central Region	7135	24151.58	7980.47	3416
Western Region	4205	980	3086.27	3310
MW Region	1650	450.5	1508.44	3452
FW Region	1190	175.25	558.6	3335
<b>Total</b>	<b>23680</b>	<b>27875.03</b>	<b>20204.03</b>	<b>16908</b>

Source: Statistical Information on Nepalese Agriculture, 2069-070

Though the central region has higher production, the yield/ha is the highest in mid western development region. This shows that if there is an increase in water surface area and supporting services in the mid western development region, the production level can be increased at a higher rate compared to other development region.

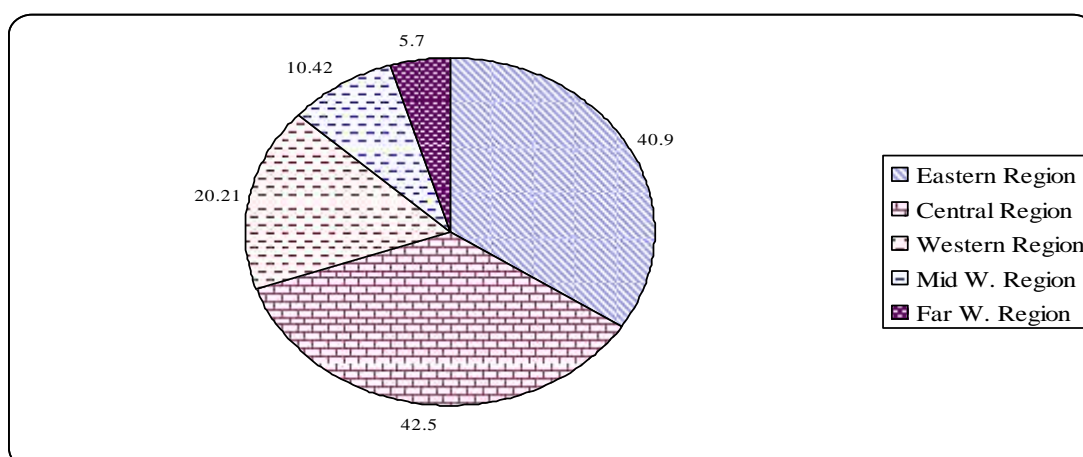
**Fig. 4.2 Regional wise Comparisons of Fish Production in Nepal.**



**Table 4.3 Regional share of Production of Fish in Nepal**

Region	% Of fish production
Eastern Region	40.90
Central Region	42.50
Western Region	20.21
Mid W. Region	10.42
Far W. Region	5.70

**Fig. 4.3 Regional Share of Production of Fish in Nepal**



The above figure shows the central and eastern development region dominance in fish production 83% of the total fish production of Nepal with area of only 37% of total land area, as compared to 25% of fish production by other three-development region having land area of 63% of Nepal. Nepal is endowed with many forms of water resources scattered throughout the country. These bodies are in the form of rivers and streams, lakes, reservoirs, ponds, swamps and paddy fields. On the basis of the resource availability, the rivers are of major importance representing about 49% of the total water area. Lakes and reservoirs cover 0.8%, and swamps and irrigated paddy fields share the rest 50.2% open waters cover approximately 5.5% of the total area of Nepal.

**Table 4.4 Estimated water Surface Area in Nepal.**

<b>Resource</b>	<b>Estimated Area (ha)</b>	<b>Coverage %</b>	<b>Potential for Fisheries (area in ha)</b>
Natural waters	501400	45.00	
Rivers	49200	1.20	
Lakes	6000	0.60	
Reservoir's	1300	0.20	75000
Village ponds	7500	0.75	15000
Marginal swamps around irrigated fields	122500	1.50	
Irrigated paddy fields	367000	50.75	
Total	1497700	100	

The following table and graph summarizes the total annual production from various sources in Nepal in the financial year 2069-070.

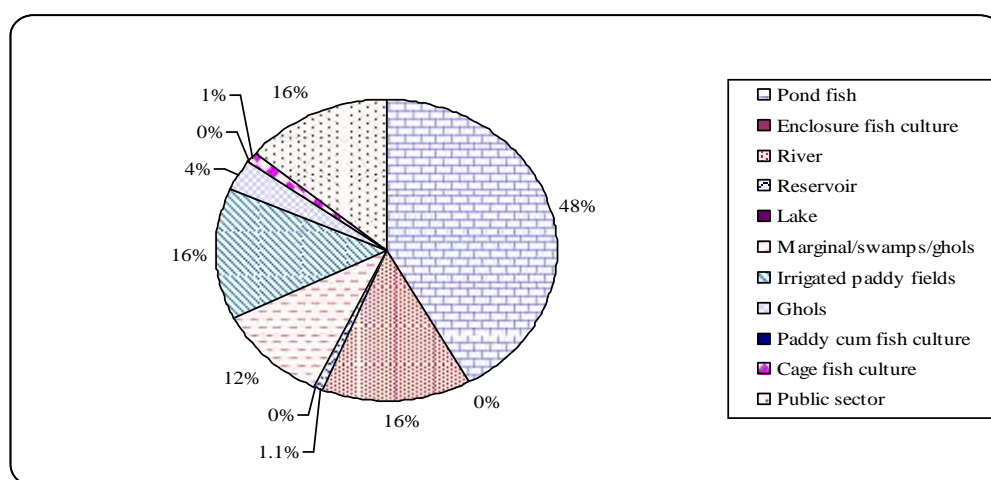
**Table 4.5 Annual productions of various sources in Nepal**

<b>Particular</b>	<b>No. of ponds</b>	<b>Total area (Ha)</b>	<b>Production (MT)</b>	<b>Yield Kg/Ha</b>
Pond fish	25720	7521	22112	3550
Enclosure fish culture		110	135	
River		395000	6950	
Reservoir		1500	3561	
Lake		5000	794	

Marginal/swamps/ghols		11000	5052	
Irrigated paddy fields		41000	6833	
Ghols		1450	1878	
Paddy cum fish culture		2801	113	
Cage fish culture		44000m3	217	
Public sector			32	
<b>Total</b>			<b>47677</b>	

Source: Statistical Information on Nepalese Agriculture, 2069-070

**Fig. 4.4 This pai diagram shows percentage of production (Mt)**



The pond culture contributes almost 47.60% of the fish production in Nepal, which is 20213 metric tones with an average of 3.2 tones per hecter.

### 4. 3. Status of fish Production in Kailali District

#### 4.3.1 Fish cultivated area and fish production in Kailali

Production of fish depends on cultivation area of it. If there is small cultivation area then there will little production and vice-versa. Area of cultivation is one of the topmost factors that govern the amount of production. The above traditional view can prove the given table of fish production and its incremental situation in Kailali district.

**Table 4.6 Fish cultivated area and fish production in Kailali,**

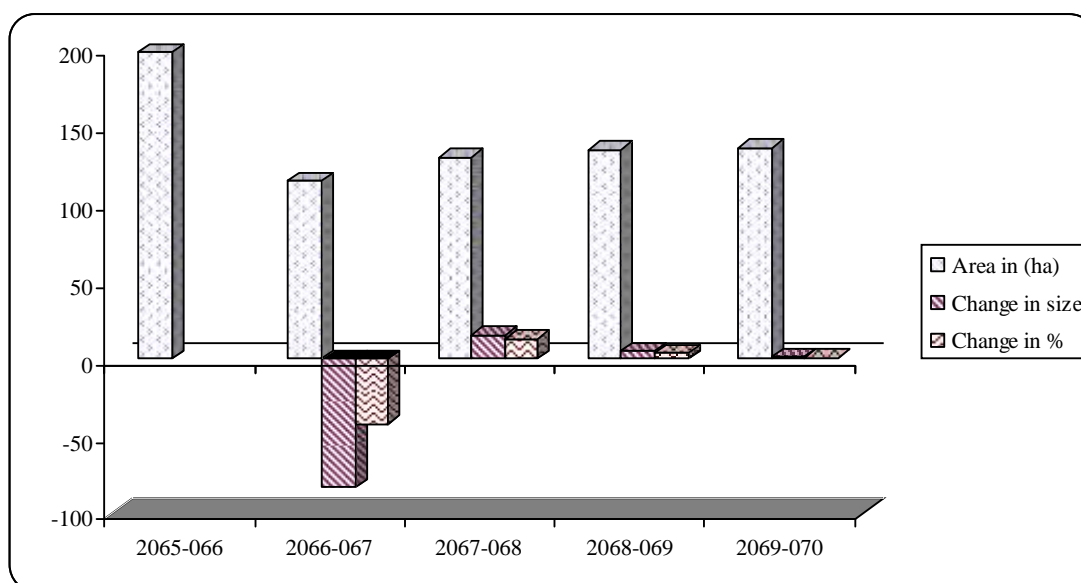
<b>Fiscal Year (Bs)</b>	<b>Area in (ha)</b>	<b>Change in size</b>	<b>Change in %</b>	<b>Production in (mt)</b>	<b>Change in size</b>	<b>Change in %</b>
2065-066	198			350		
2066-067	115	-83	-42	435	85	24.29
2067-068	130	15	13.04	440	5	1.15
2068-069	135	5	3.85	580	140	31.89
2069-070	136	1	0.74	750	170	29.31

Source: District Agricultural Development office, Kailali

Table.4.6 Indicates that the production trend for the last 5-years presents sufficient idea to assess that fish production in the district is in increasing trend with some irregularities. The change in percentage for both production as well as area cultivated does not proportionate. In majority of above table reflects that the change in production of fish ultimately followed by the change in area. In 2066-067 -42% decreases in the year 2067-068 area is increased by 13.04% and production is increased by 1.15%. Beginning of the year, shown in the table the production is increased and cropland area is decreased but after 2067-068 the ratio of cropland and production is slowly increased.

Although, in some years production is increased with decreased in cropland because it can't be proved that relationship between fish cultivation area and production is negative. It can clarify with help of bar diagram, which is presented as flows

**Fig. 4.5 Production Trend of Fish in Last 5 Year.**



#### **4.3.2. Average Yield Rate of Fish in Kailali**

Due to the climate, improved fingerlings, fertilizers, method of farming, availability of modern technology, fish production trends differ from year to year and place to place. In Kailali the average yield rate of fish production is 3.7 mt/ha. Where the technology is improved the productivity is available up to 5mt/ha. The productivity can be increased by water supply, credit and input supply, training, market development and advanced technology. Till now, the fish cultivation knows as only for food hand and mouth. It is necessary to develop it as entrepreneurship.

**Table 4.7 Average yield rate of fish in Kailali**

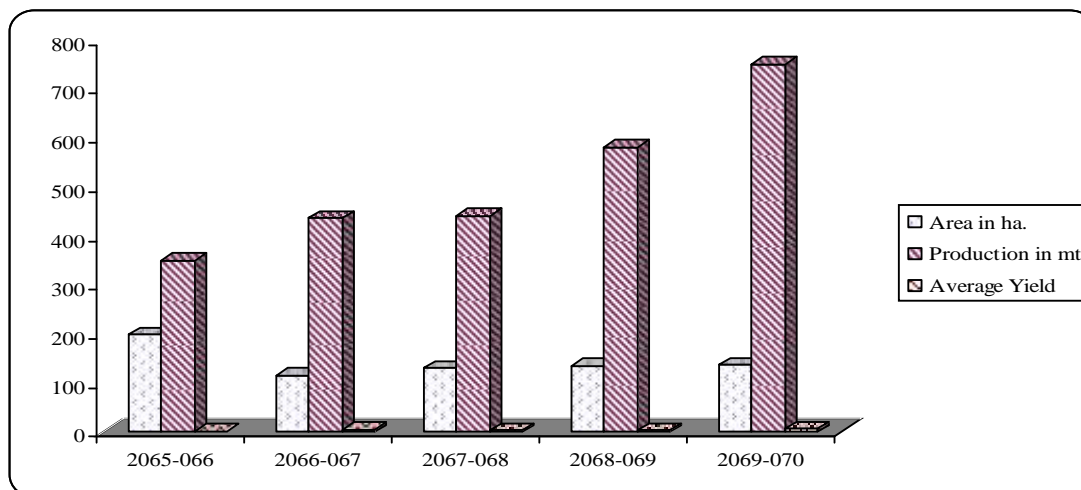
F/y (Bs)	Area in ha.	Production in mt	Average Yield
2065-066	198	350	1.76
2066-067	115	435	3.78
2067-068	130	440	3.38
2068-069	135	580	3.29
2069-070	136	750	5.51

Source: District Agriculture Development Office, Kailali

The above table shows the average productivity and its change year by year. The table clearly shows that the productivity of fish in Kailali has been

increasing from the above 5 year. But in 2067-068 it is decreased slightly. In 2068-069 the productivity is increased highly by 5.6 mt/ha.

**Fig. 4.6 Average Yield Rates of Fish**



From the above discussion it can easily considered that the relationship between fish production and yield rate is positive and significant

#### **4.4. Analysis of fish Production Trend**

Because of growing popularity among the farmers, increased use of improved fingerlings and fertilizers the Production of fish is increasing rapidly in Kailali district. Though, the fish production is increasing it can not favorable in course of time as the sense of comparison to other food grains productions. The key role played by agriculture in Nepalese economy necessitates a rapid increase in agricultural production in order to achieve an accelerated pace of economic development. The special importance of fish in this connection cannot be denied.

Following table reflects the fish production and its trend in Kailali

**Table 4.8 Fish production and its production trend in Kailali**

F/Y (Bs)	Actual production (y)	Deviation from 060/061(x)	Sq. of deviation (x <sup>2</sup> )	Product of X and y
2065-066	342	-2	4	-684
2066-067	330	-1	1	-330
2067-068	435	0	0	0
2068-069	470	1	1	470
2069-070	750	2	4	1500

$$N=5, \quad y = 2327, \quad x = 0, \quad x^2 = 10, \quad xy = 956$$

The above table reflects that fish production over the years is increasing with some irregularities in 2066-067 and 2067-068. Total production of 2069-070 is 750 mt, which is higher than all of the year. Some time it is increasing and some time it is decreasing. Though, the trend of fish production is favorable. The calculation of fish production and its production trend is shown in above table with the help of the statistical formula which is given below. The rate of growth in fish production is 956 mt. for the whole year. That is the overall picture of fish production is smoothly expanding.

In order to show the trend of fish production in Kailali the formula used is-

$$y = a + bx \dots\dots\dots 1$$

$$xy = a \sum x + b \sum x^2 \dots\dots\dots 2$$

Trend ordinates of fish production is defined from the variable y that is  $y = a + bx$

Where,

Y is dependent variable

X is independent variable

A and b are some constant items,

$$a = \frac{\sum y}{N}$$

N

$$b = \frac{\sum xy}{\sum x^2}$$

X<sup>2</sup>

## 4.5 Cost and Return Analysis of Fish production

The initial capital costs for establishing and creating the assets and liabilities in a fish farm are generally higher. Investment cost of fish farm is much higher in comparison with other farming. This section attempts have been made to analyze the production cost and return of fish grown in Kailali district. Cost of production contains all the addition expenses like labour, agriculture tools, fertilizer, irrigation etc.

Total income includes the total sale or production of fish. Here we have to know that the total sale or production is not return. Net return is that part of sueplus which received from the sale of output. Only net return is the profit for the farmer. Net return is the difference between total production value and total cost. Total costs contain fixed cost and variable cost.

District Agricultural Development Office has made a study about “The cost of production and return in 2069-070” in its pocket area of improved fingerlings in natural pond and artificial ponds. The survey shows that the productivity and return is high in the artificial ponds of improved fingerlings than local fingerlings. Cost and return of fish in Kailali is presented as below-

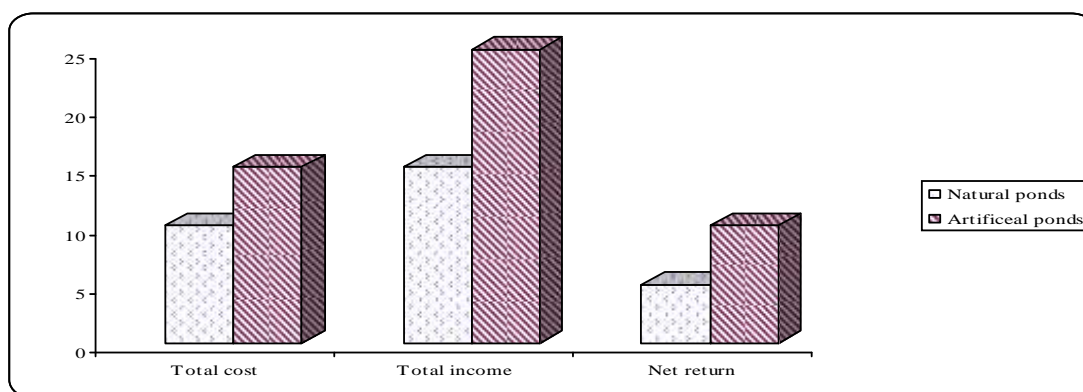
**Table 4.9 Cost and return of fish in Kailali**

Rs 000/ha

Situation of fish production	Total cost	Total income	Net return
Natural ponds	10	15	5
Artificial ponds	15	25	10

Source: District Agriculture Development Office, kailali

**FIG. 4.7 Cost and Return of Fish in Kailali.**



]Above presentation shows that the total cost per hector is 10 thousand, income is 15 thousand and the net return is 5 thousand which is 40%, 50% and 10% respectively in natural pond for improved fingerlings. So on, total cost 15 thousand, total income is 25 thousand and net return is 10 thousand which is 29.41%, 50% and 20.59% respectively in artificial ponds for improved fingerlings. Net return from fish production also depends upon the inputs and tools used in the farm. Large size group framers can offer better inputs and use modern tools.

Large size of group farmers can gain higher return from fish cultivation using improved variety as compared to medium and small size group. In case of local variety, large size group also unable to gain suitable return.

#### 4.6. Demand Analysis

Kailali is the main fish production area of Far West Regain. The hilly area is also depending on it for fish. Most of the production fish is import from India. Fish balance of Kailali district has been decreasing year by year due to increasing in migration system in current situation of conflict. The following table shows that the fish balance of Kailali district.

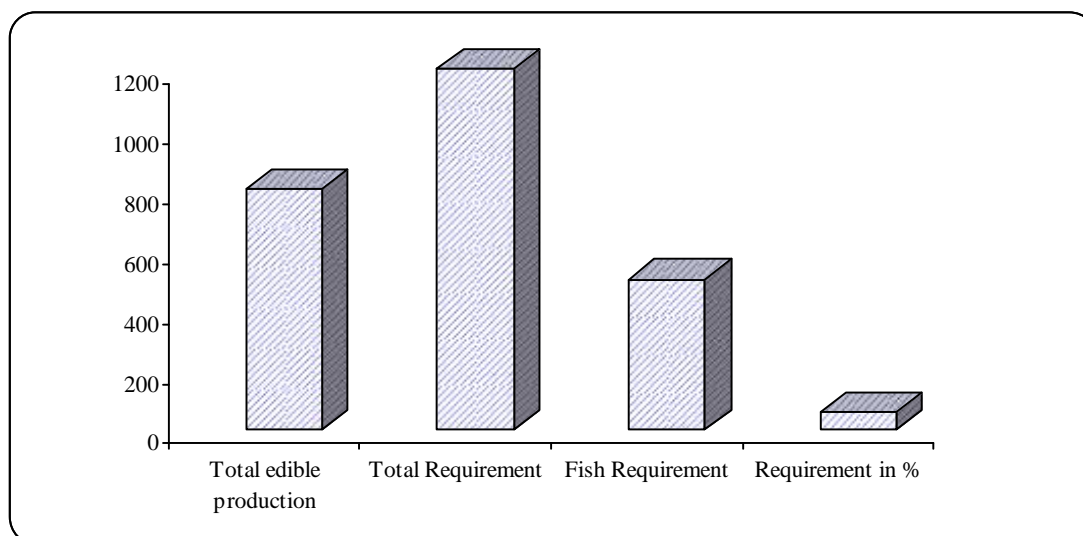
**Table 4.10 Fish Requirement in Kailali district**

<b>Description</b>	<b>Fish in mt.</b>
Total edible production	800
Total Requirement	1200
Fish Requirement	500
Requirement in %	57.14

From the above table, the total edible production of fish in Kailali district is 800 mt. Total requirements to total population for eating is 1200mt. The requirement of fish is 500 mt., which is 57.14%. The requirement fish are imported from India.

The above position of fish requirement of Kailali can be seen in the bar diagrams, which is given below.

**Fig. 4.8 Fish requirement in Kailali district.**



#### **4.7. Site Selection for Fish Production**

The economic viability of any fish farming operation is vitally dependent upon site selection. It affects running costs, rate of production and mortality rates etc. Water based aquaculture system can suffer more than land based operation as a result of wrong site selection, and hence it is extremely important to get site selection for fish production.

The criteria for selection of suitable sites for fish culture may be considered fewer than three categories. The first is primarily concerned with the physical chemical conditions which dictate whether a species of fish can thrive in an environment (temperature, salinity, oxygen, current, pollution, algal blooms, exchange). The second is the conditions that should be considered in order to install a pond structure successfully (weather, shelter, depth, substrate), whilst the third category includes those factors which determine profitability of the venture (legal aspect, access, land based facility, security, economic and social consideration). Although much of the data required must be collected through survey work and analysis of water samples, invaluable information can also be gained by talking to local people about factors likely to affect the venture, including matters such as prevailing weather condition, occurrence of toxic blooms, pollution, etc.

**Table 4.11 Criteria for Site Selection of Pond**

<b>Category 1</b>	<b>Category 2</b>	<b>Category 3</b>
Temperature	Depth	Legal Aspect
Algal Blooms	Shelter	Access
Disease Organisms	Substrate	Security
Water Exchange		Proximity to markets
Salinity		
Pollution		
Suspended Solids		

#### **4.7.1 Turbidity**

Suspended solids can cause a number of problems in aquatic systems, it is principally their direct effects on the cages fish that are of concern to the fish farmer. High levels of suspended solids will cause gill damage including proliferation and thickening gill epithelial tissues. If the damage is severe the fish may die. Mortality rate varies with the species. The larger and harder particles cause greater injury to gill tissues. Mortality often occurs after a period of exposure, thus complicating diagnosis. The presence of suspended solids in the water has also been implicated in disease such as 'fin rot'. Turbidity affects the visibility, resulting less feeding and impairment of growth.

It appears that turbidity below about 100mg has little effect on most fish species. Above this value the picture becomes complicated particularly by factors such as duration of exposure to such conditions.

#### **4.7.2 Pollution**

M.W. Hold gate (1979) has defined pollution as: 'the introduction by man into the environment of substances or energy liable to causes hazards to human health harm to living resources and ecological system damage to structure or amenity or interference with legitimate uses of the environment'. Thus with respect to pond fish farming a pollutant could be something which damages the pond structure, adversely affects the cultured fish or its food or could accumulate in the fish to such a degree as to prove toxic to man when ingested. The risk may be significantly reduced by setting pond as

far away as possible from large industrial areas. Special care must be taken to ascertain the levels of any pollutants during the site selection process.

#### **4.7.3 Phytoplankton Bloom**

The term phytoplankton bloom refers to the periodic occurrence of large population of planktonic algae in fresh and marine waters, whenever the appropriate conditions prevail: high light level, high nutrient levels, warm water temperatures and a combination of favorable hydrographic conditions. Algal blooms can adversely affect fish, not only through their physical presence in the water, which damage or clog gills, but also through their influence on the DO pool. Several phytoplankton species are responsible for musty flavors in fish, whilst other species are known to produce toxins. The effect of phytoplankton on DO also affects the farmed fish. From a pond point of view, it would therefore, seem best to avoid sites where toxin producing cyanobacteria may exist.

#### **4.7.4. Disease**

Pollution of pond water, high water temperature, high water turbidity, high cultured stock density, overfeeding, rough handling, nutritional and vitamin deficiency and excessive nitrogen gas in water are some of the primary causes of disease outbreak. Daily cleaning of non-consumed feed, excreta and unwanted deposits in the pond is the best way to prevent the outbreak of diseases.

#### **4.7.5. Water Exchange**

Good water exchange or flushing, at a site essential for intensive pond operation in order to minimize the build up of wastes and all the attendant problems that this can cause. Water exchanges dependent upon the currents.

In extensive culture situations, water currents are also essential for the supply of food. However, excessive current will impose additional dynamic loadings on the pond, and cause stress to the ponds fish

#### **4.7.6 Selection of Suitable Species**

In principle, almost every cultivable species of fish can be cultured in ponds. But fish species used in pond culture in most of the Asian countries belong to the family cyprinid and mainly varieties of carps.

#### **4.7.7 Criteria of Selection**

They are selected for pond culture on the basis of the following criteria:

- i) Ability to adapt the crowded conditions.
- ii) Food habits adapted to the types of organisms living in or around the water bodies.
- iii) Natural ability to grow rapidly.
- iv) Tolerance of low dissolved oxygen.
- v) Ease of handling and harvest.

#### **4.7.8 Some Cultivable Species:**

The natural fish food in the lakes is variable so that fish species with different feeding habits are selected to utilize the available resources. The following carps are found suitable for pond culture in Nepalese Lakes and Reservoir.

##### **4.7.8.1 Bighead carp**

This fish feeds by straining plankton from water. Larvae feed mainly on small plankton such as unicellular phytoplankton, rotifer and naupli larvae. Fry and adults feed mainly on zooplankton but eat phytoplankton as well. It feeds about 20% of its body weight and digests 20-30% of the consumed blue green algae. It is passive when handled, so handling mortality is low. Bighead carp continue to feed down to 14°C. This fish has the best potential for pond culture where the water bodies are fertile.

##### **4.7.8.2 Silver carp**

This fish is mainly a phytoplankton feeder when adult. Young fry feed on zooplankton, rotifer and naupli larvae. Their diet expands as the fry grows to include copepods, cladocera and phytoplankton. The gills of silver carps have a complex

network and diffusion of closely set gill rakers. Silver carp also feed at temperature down to 14°C. This fish is suitable for culture in plankton rich water. The major problem with this species however, is stress intolerance. It requires careful handling.

#### **4.7.8.3 Grass Carp**

Adult grass carp feed on a wide variety of aquatic macro vegetation and also consume certain terrestrial plants. The natural food of grass carp fry (7-9 mm) is protozoa, rotifer and naupli larvae. Their diet includes cladocera and copepods when they grow to 12 mm. As the fish grow large, phytoplankton and minute algae added to their diet. Older fish with a weight above 50g can be fed with chopping grass in the ponds. They can be by cultivated in water bodies poor in plankton.

#### **4.7.8.4 Common Carp**

Common carp is a bottom feeder. Post larvae up to 10mm feed on ceriodaphnia, moina, Cyclops and naupli larvae. Older fish thrive on decaying vegetable matter containing bottom dwelling organisms, notably tubificids molluscs, chironomids, ephemeroptera and chiropteran. Being a bottom feeder, common carp needs additional feeding in the ponds.

#### **4.7.8.5 Naini**

Naini is an omnivorous. It is now cultured in several countries in Asia. It is cultured in pond raceways and cages depending on local conditions. Naini is a tropical fish with poor resistance to cold temperature, so it can not survive in temperate region. It is useful in aquaculture where warm water from industries can be utilized.

#### **4.7.8.6 Rohu**

Rohu is a bottom and column feeder which feeds on plant matter including decaying vegetation. Fingerlings (100-250mm) subsist on unicellular and filamentous algae (15%), rotting vegetation (55%) rotifer and protozoa's (2%) and crustaceans (8%). The rotten vegetation component in the food increases in bigger fish. The growth of this fish without supplementary food is very poor. When stocked in low densities (2-4%) in number in a pond however, growth has been very good. Rohu helps to clean the ponds by feeding on algal and other organism growing on the mesh.

## **4.8 Seed Management**

### **4.8.1. Selection of Fingerlings**

Farmers depends on external suppliers for fingerlings unless they have a hatchery and follow the old maxim of 'buyer beware' when it comes to choosing a source of supply. The following points must be considered before purchasing the fingerling:

- i) Suitable fish species must be selected.
- ii) The fingerling must be healthy.
- iii) The size must be suitable for pond fish culture.

### **4.8.2. Transportation**

Transportation is one of the important factors of marketing which helps to transfer different goods and other from one place to another place and make our work easier and faster. The development of the country is also depending to transportation facilities. Without the transportation facilities, producer cannot carry their products from production center to marketing centers. Thus, transportation has its own importance in the function of physical supply of commodity. The carp being transferred from hatcheries or other systems should be starved for at least 24-48 hours prior to transport in order to clear their gut and to reduce oxygen consumption. Because of the rigors of the journey, fish should be carefully checked, and injured or weak fish removed and, if necessary, treatment for ectoparasite should also be carried out. The process of capture, handling or loading and transport are highly stressful to fish, resulting not only in physical damage but also in change blood chemistry, increased oxygen consumption, osmoregulatory problems and increased susceptibility to disease, some species such as silver carp, are particularly difficult to transport. It follows, therefore, that during transport, handling should be kept to minimum. Plastic bags can be used which should be one third filled with water and remaining space filled with oxygen prior to sealing and double bagging for safety. Alternatively, an insulated transport box which can hold up to 3000 it and mounted on the back of truck can be used. The tank should have rounded corners to minimize the damage of the fish.

### **4.8.3 Stocking**

Stocking density is dependent more on the volume of water supply, temperature and oxygen concentration in water than the actual size of pond. Very fast running water is also not desirable. If the current is too fast, fish energy might be used more for swimming instead of growth. On the other hand slow current results in the accumulation of wastes. Water flow must be increased in summer when water temperature is higher and dissolved oxygen lower than in winter. Before transferring the fish to ponds, care should be taken to ensure that the temperature of the fish is adjusted to approximately that of their new environment. The bags of fish should be placed in the ponds and the temperatures allowed equilibrating prior to release.

In warm climates, transfer to ponds should be carried out in the evening or early morning if possible. The feeding of fish immediately after transfer to ponds is generally not recommended. Some fish, such as Naini, recover fairly quickly from handling and regular feeding can commence 3-4 hour after transfer whereas more stress sensitive fish.

### **4.8.4 Feed and Feeding**

Feeding is a very important part of fish culture. Two types of feeding practices are used: a) intensive feed ( machine feeding), which is used for well equipped and well managed farm, and b) semi intensive feed (hand feeding), which needs frequent supervision of the ponds, and is used on fish farms with less facilities. In case of hand feeding, young fish must be fed 7-8 times a day at 60-90 minute intervals. As the fish grow over 10 g feeding frequency can be reduced to 3-4 times a day. When the fish reach over 50 g feeding twice a day is sufficient. However, it must be noted that feed and size of pellets control the growth variation of fish among individuals of the same group.

#### **4.8.4.1 Types of Food**

Fish feeds are of two basic types

##### **4.8.4.1.1. Intensive Feeds**

Intensive feeds are used principally in the culture of carnivorous species and high value species. Intensive feeds differ from semi-intensive feeds in that they must

supply all the nutritional requirements of the cultured species, including the right quantities and qualities of proteins, fats, carbohydrates, minerals and vitamins.

#### **4.8.4.1.2 Semi -intensive feed**

Semi - intensive feed are relatively low in protein and made from locally available materials at low cost. Fish grown in semi-intensive situations still rely heavily on natural feed which is comparatively high in terms of protein. Supplementary food, high in terms of carbohydrate and fat, will spare the protein from being used as an energy source, and allow it instead to be utilized for growth. This type of aquaculture is only suited to certain species of fish, such as herbivores, planktivores, detritivores or omnivores, grown in conditions where there is a plentiful supply of natural feed

### **4.9 Preparation of Balanced Feed with Local ingredients**

There are two basic types of feeds, intensive and semi-intensive feed. It is believed that most appropriate for the Nui Coc Reservoir in Vietnam, pond farming is a low cost semi-intensive feed. In this, system the fish can be grown using a combination of naturally available feed and supplementary feed with agriculture by- products, a semi-intensive feed can be formulated with the combination of different local ingredients of known crude protein percentage. A simplified square method could be followed to prepare a balanced feed of desired protein percentage.

- i) Selection of local ingredients and determining their protein percentage.
- ii) Listing out the ingredients according to their protein percentage in ascending order. Divide them into two groups.
  - a) Protein supplements feed-with higher protein than the desired feed.
  - b) Basal feed-with lower protein than the desired feed.
- iii) Calculate the average percentage of protein in both feeds
- iv) Draw a square and write desired protein percentage of the feed in the center, the average protein percentage of protein supplement feed on the left side of the square.

- v) Similarly write down the average protein percentage of basal feed on the top of the square.
- vi) Subtract the average percentage of basal feed from the desired one and protein percentage of the desired feed from the average protein percentage of protein supplement feed. Write down them on the bottom and the right side of the square. The numbers will represent the quantity of both feeds in the total quantity of the formulated feed.

#### **4.9.1 Storage of Feed**

To maintain the quality of feed, there should be good storage facility. Feedstuffs should be kept in clean, dry, cool facilities used solely for that purpose in order to avoid contamination with other materials often stored on farms, such as insecticides and pesticides or petroleum products. Both temperature and humidity have a great influence on the rates at which chemical changes take place and on the growth of fungi and insects. Insects and rodents can not only eat considerable quantities of the feedstuff, but also spoil much more than they consume. Faecal contamination of feed has been shown to be a source of salmonella infection in farmed fish. Deterioration of stored dry feeds and feedstuffs can be minimized if the following points are followed:

- i) All spoiled material should be swept up.
- ii) Rodents and insects must be kept under control.
- iii) Feeds should be checked frequently if any change in feed Color and texture noted for evidence of spoilage.
- iv) Feed should be checked before being put into the store.
- v) Feeds should be stored in bags and raised off the ground.
- vi) Ventilation in the storage facility should be maximized and temperature should be kept as low as possible.

#### **4.9.2 Feeding**

For the appropriate growth of fish feeding is most important aspect. In most intensive and semi-intensive pond farms fish are fed throughout the year, except during period of adverse weather. Since all metabolic activities of fish are directly related to the water temperature, feeding rate should be calculated (Table 4.12) on the basis of temperature and body weight of the fish.

Moist balls of feed or polluted feeds any be conveniently fed to the fish by placing them on a feeding tray. The principal advantage of hand feeding is that farmer can assess how hungry their fish are and consequently adjust the amount of feed to be given. In this way they can also readily monitor the health status of their stock, since sick or stressed fish will usually stop feeding. Depending on whether pond rearing is small or family based, the quantities and qualities of the materials used may be highly variable.

**Table 4.12 Feeding rate (body weight %) for carp according to water temperature and body weight of the fish.**

°c\g	2-5	5-10	10-20	20-30	30-40	40-50
15	4.9	4.1	3.3	3.1	2.7	2.2
16	5.2	4.4	2.5	3.3	2.9	2.3
17	5.5	4.7	3.7	3.6	3.1	2.5
18	5.8	5.0	4.0	3.9	3.4	2.7
19	6.3	5.4	4.4	4.2	3.7	2.9
20	6.9	5.9	4.9	4.6	4.0	3.2
21	7.5	6.4	5.2	4.9	4.3	3.4
22	8.1	6.9	5.6	5.3	4.5	3.6
23	8.7	7.4	6.0	5.6	4.9	3.9
24	9.2	7.9	6.4	6.0	5.1	4.1
25	9.8	8.2	6.7	6.2	5.4	4.4
26	10.4	8.8	7.0	6.6	5.8	4.6
27	11.0	9.4	7.5	7.2	6.2	5.0
28	11.6	10.0	8.1	7.8	6.8	5.4
29	12.6	10.8	8.9	8.4	7.4	5.8
30	13.8	11.8	9.8	9.2	8.0	6.4
31	14.4	12.6	10.2	9.8	8.6	7.0
32	15.0	13.2	11.8	10.4	9.2	7.6

**Table no. 4.13**

°c\g	50-100	100-200	200-300	300-700	700-800	800-1000
15	2.4	1.9	1.6	1.3	1.1	0.8
16	2.6	2.0	1.7	1.4	1.1	0.8
17	2.8	2.2	1.8	1.5	1.2	0.9
18	3.0	2.3	1.9	1.7	1.3	1.0
19	3.2	2.5	2.0	1.8	1.4	1.0
20	3.4	2.7	2.2	1.9	1.5	1.1
21	3.6	2.9	2.3	2.0	1.6	1.2
22	3.9	3.1	2.5	2.2	1.7	1.3
23	4.2	3.3	2.7	2.3	1.8	1.4
24	4.5	3.5	2.9	2.5	2.0	1.5
25	4.8	3.8	3.1	2.7	2.1	1.6
26	5.2	4.1	3.3	2.9	2.3	1.7
27	5.5	4.4	3.5	3.1	2.4	1.8
28	5.9	4.7	3.8	3.3	2.6	1.9
29	6.3	5.0	4.1	3.5	2.8	2.1
30	6.8	5.4	4.4	3.8	3.0	2.2
31	7.3	5.8	4.7	4.1	3.3	2.4
32	7.8	6.2	5.0	4.4	3.8	2.6

Source: District Agriculture Development Office, kailali

#### **4.10 Monitoring Water Quality**

The aims of investigating water quality monitoring routine are as follows:

- i) To gain information of long term changes in water quality at a site, so that any proposed changes in production may properly evaluated.
- ii) To evaluate sitting and configuration of pond with in a water body.
- iii) To maintain optimum stocking and feeding rates.
- iv) To avoid losses caused by lethal changes in water quality.

- v) To help evaluate how stressed the ponds stocks are, so that jobs which might further stress the fish, such as grading and growth check can be avoided.

The most valuable data that should be collected in are dissolved oxygen and temperature. Periodic measurements throughout the year should be carried out and the frequency of observations during warm spells should be increased. A single temperature and oxygen determination from the middle of the pond within the group will suffice to give an indication of levels of affecting the fish stocks.

Data on nitrogen (ammonia, nitrite and nitrate) and dissolved phosphorus levels, p, Secchi disc and chlorophyll level are of importance in that they give the fish farmer a more complete picture of what is happening in the pond farm environment. Again, these tests should be carried out at regular intervals but are of particular importance during periods of calm, hot weather, whilst p and secchi disc reading can be reading taken using simple equipment; other tests are usually carried out by chemical methods. Several portable Hach kits, which are suitable for use by fish farmers, are available (can be purchased).

#### **4.10.1 Growth check**

All fish do not grow at the same rate, some grow faster, and other remain smaller. Active and bigger fish that become dominant within a group will eat more and grow fast, while the smaller and weaker ones will eat less and grow slowly. This phenomenon is especially prominent in the high-growth-rate fry stage and in its extreme will lead to cannibalism and thus a reduction in the culture population. Thus, it is necessary to periodically thin out and grade the stock to maintain steady growth. The bigger ones should be sorted out from the smaller ones, using a grader (a selection device) to reduce mortality rate. The sorting by body size should be done every one or two months, with the young every fortnight or monthly. Growth checking during the grading is necessary to determine the feeding rate, feed efficiency and condition of health. Pond cleaning is another very important part and frequent pond cleaning is necessary to avoid a disease outbreak. Fish pond discretion in Kailali district shows by given table:

**Table 4.14 Fish ponds discretion in Kailali**

S.N.	VDC\MUN	Natural ponds		Artificial ponds	
		Pond no.	Area (ha)	Pond no.	Area (ha)
1	Udashipur	2	31.2	35	2.47
2	Chaumala	8	9.7	49	1.71
3	Urma	6	40.2	10	0.26
4	Jankinagar	0	0	13	1.59
5	Mashuriya	0	0	36	2.31
6	Durgauli	0	0	17	1.86
7	Narayanpur	0	0	11	2.55
8	Dhansingpur	0	0	6	0.33
9	Lalbojhi	14	46.3	7	0.41
10	Fulbari	7	34.4	12	2.82
11	Pahalmanpur	0	0	21	3.76
12	Basauti	12	31.54	32	1.0
13	Joshiपुर	5	9.12	131	14.49
14	Bauniya	3	42.53	51	6.03
15	Gadariya	7	70.5	2	0.01
16	Balia	2	2.33	17	2.46
17	Dhabgadhi	16	50.92	78	6.11
18	Tikapur	0	0	201	50.97
19	Kailad	21	150.32	13	1.47
20	Ramshikharjhala	11	12.02	7	2.09
21	Pathriya	0	0	12	0.22
22	Shreepur	0	0	55	5.46
23	Darakh	5	144.1	28	2.31
24	Bhajani	0	0	15	1.56
25	Thapapur	0	0	40	4.46
26	Sandhepani	27	70.5	37	7.37
27	Pawera	6	22.73	44	3.17
28	Hasuliya	9	60.36	33	1.18
29	Ratanpur	8	47.82	18	0.73
30	Geta	0	0.	121	17.22
	<b>Total</b>	<b>169</b>	<b>876.59</b>	<b>1152</b>	<b>148.38</b>

Source: District Agriculture Development Office, kailali

#### **4.10.2 Capital Requirement for Fish Industry**

Capital is the most important factor to run any types of industry. In this district, the income in agriculture sector is quite low because the amount of agriculture products is not very high which causes lack of capital. The product in the farm economy is spending for home consumption. Whatever amount received for sales of agricultural products is spend generally on necessary goods e.g. cloths, medicine, foods, etc. In the rural areas, the surplus left after meeting daily necessary things is very low or sometimes no surplus at all. Capital is most necessary for the farmers just as it is for other entrepreneurs to increase expenses in producing goods in advance of receiving payment for the finished products. That is to say farming requires capital. Under this situation farmers cannot adopt any improved method of production and it leads to progressive decline in yield of agriculture products.

It is necessary of borrowing for farming. I conduct a survey among the farmers. In their version it is very difficult to get surplus from the production of fish. They have to get borrow from local Mahajans, financial institution etc. The survey shows that farmers are getting production loan easily from financial institution. There are many financial institution in Kailali e.g. ADBN,MPB, RBB, NBL, MBB, EBL,SDB, NB BANK, Nabajeewan co-operative etc. Besides of them, according data more than 95% agriculture credit is served by ADBN. Thus, it has its best image in the public for its service. Until now we are considering about borrowing as a source of capital to cultivators. It is only short run solution. We must think about the better opportunities to the farmers to increase their income and their by capital formation.

Income among farmers is dependent upon the amounts received from the sales of agricultural products. Net return from fish production is low due to the reduction in the price of fish and increasing in the price of fertilizers and other agricultural inputs.

#### **4.10.3 Source of capital**

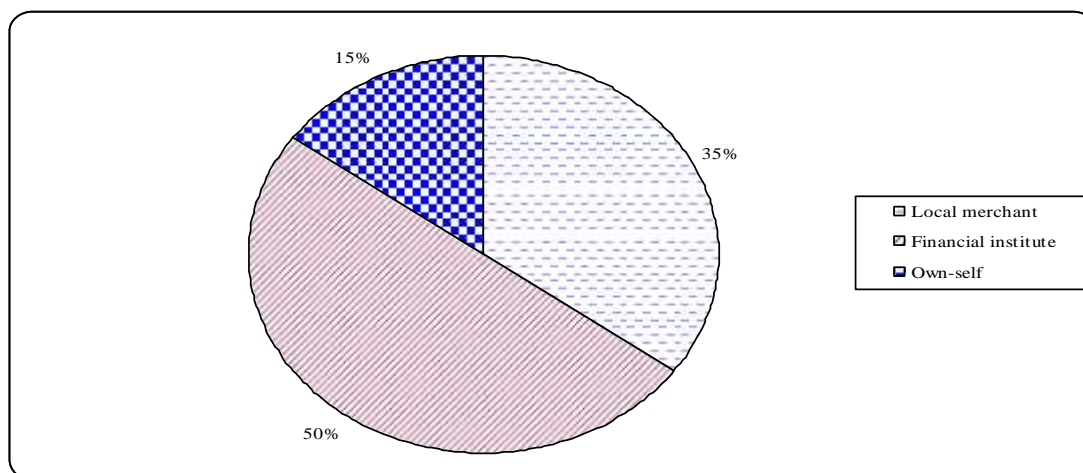
In the kailali district many financial institutions are established to provide loan facility to the farmer. The main source of capital in Kailali is loan facility available by the financial institute, local merchant and surplus after sales of production. In their view, the farming cost per hectare in artificial irrigated ponds Rs.15, 000/ and in natural irrigated ponds Rs. 10,000/.

The table shows that how the farmer of Kailali fulfill their capital necessary.

**Table 4.15 Sources of capital of farmer in Kailali**

Local merchant	Financial institute	Own-self	Total
35%	50%	15%	100%

**Fig. 4.9 Source of capital**



The table and figure indicate that 15% farmers use their own capital in farming, 50% take loan from financial institute and 35% take loan from local merchants. In the case of financial institute above 95% farmers take loan from ADBN. In their views, the interest rate is very high from the local merchant. But the lack of financial institute in remote area, they have to depend on merchant. The following table shows the name of financial institutions located in kailali district.

**Table 4.16 Name of financial institution**

S.N	Financial institute's name	Branch
1	Agriculture Development bank ltd	DHN
2	„ „ „ „	Tikapur
3	„ „ „ „	Bhajani
4	„ „ „ „	shukhad
5	„ „ „ „	Lamki
6	Nepal bank ltd	DHN
7	„ „	Tikapur
8	Ratriya Banijya bank	DHN

9	„ „ „	Bhajani
10	„ „ „	Attariya
11	Malika Bikas bank	DHN
12	„ „ „	Masuriya
13	„ „ „	Tikapur
14	Evrest Bank ltd	DHN
15	Nepal Bangaladhes Bank	DHN
16	Siddharth bank	DHN
17	„ „ „	Tikapur
18	Bank of Kathamandu	DHN

#### **4.11 Fish Production System Adopt by the Farmers in Kailali**

For the study, 100 samples were selected for questionnaire, discussion and interview. It was found the following system adopting by the farmers in fish production.

##### **4.11.1 Production Technology**

The farmers have been adopting both traditional and modern production system. The farmers who living at remote area, are farming with traditional technology, other is farming in both traditional and modern technology. In duration of survey, it is found that the landlord who are in few numbers and a little few who are known about the farming system are adopting the modern technology. The table shows the numbers of farmer adopting farming technology.

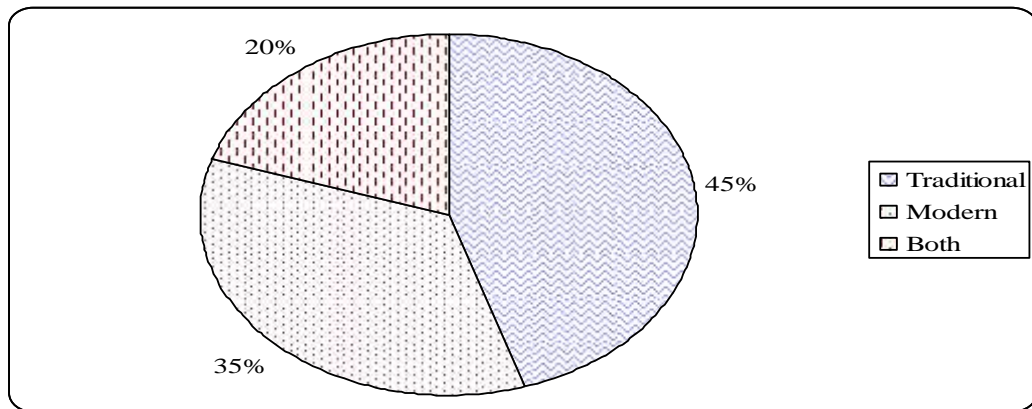
**Table 4.17 Farming technology adopting by the farmers:**

<b>Traditional</b>	<b>Modern</b>	<b>Both</b>	<b>Total</b>
45%	35%	20%	100%

It is also clear by pai diagram which is given bellow:

Diagram of fish production technology in Kailali:

**Fig. 4.10. Fish production technology in Kailali**



The above table and diagram indicate that 45% of people have been adopting traditional farming, 35% modern and 20% have been adopting both methods in Kailali District. To say them for the modern farming methods they are unknown about it. If they want to adopt it, they have lack of training. They have to use traditional methods.

#### **4.12 Contribution of Fish Industry to the Local Economy**

Wealth generated by individual, households or small enterprises can make significant contribution to local economies through income and employment multiplier effects. This is especially the case in fisheries because of the “**cash crop**” nature of the harvest. Fish may be one of the few products in some rural economies that can generate cash to 8 pars and stimulate demand, because other food products may be more generally bartered or consumed within the household.

As well as the direct impacts related to sales, and to income and employment effects on the products themselves, which result from changes in the demand or production of fish products, there are indirect impacts “upstream” and “downstream” of the production activity that occur through the commodity/supply chain. “Upstream” activities are those activities supplying inputs to the fishing operation. Typical inputs for small-scale capture fisheries include: investment costs in vessels, food, bait; labor costs; financial services; and maintenance costs. “Downstream” activities are those following the harvesting of product, which themselves require inputs. Some examples of the inputs required are: investment in design, construction and equipping, processing and marketing facilities; labor; transport of fish from landing sites and to

markets; financial services; variable costs such as ice, knives, and maintenance costs. Induced impacts are also brought out in the form of sales, income and employment effects from the changed levels of income and expenditure throughout the local economy as a result of direct and indirect impacts e.g. fishing crew may use their earnings to purchase groceries or household items.

Taking the upstream and downstream indirect activities together, and considering the induced impacts, one can easily imagine how small-scale fishing activities can become the main driver of poverty reduction, particularly in rural locations, with a web of businesses and individuals generating sales, income and employment as a result of the multiplier effects of fishing activity. The impacts on poverty of these upstream and downstream activities may not be the same for men and women, depending on how access to resources and control over infrastructure and services are gendered.

Small-scale fisheries may also contribute taxes at the local level, which can subsequently be used for local economic development, including poverty alleviation strategies.

#### **4.13 Analysis of Fish Marketing System**

Information on fish demand and consumption in Nepal is very limited. Fish is generally accepted and liked by all people. The per capita intake of fish is a low 1.05 kg/person/year, which, however, does not include imported fish. In Kailali district the per capita supply is approximately 2 kg/person/year. As up to 75% of the fish sold in the Kailali market come from India they are the lowland, warmwater fish species. The majority of marketed fish are the major Indian carp's rohu (50%) and catla (20%), and the Chinese silver carp (15%); the rest are other fish species (Dahal, 1998). Hill stream fish such as Tor, Neolissocheilus, Schizothorax, Glyptothorax and Garra are sold in smoked form in Kailali market, where they are brought from adjacent areas such as Karnali, Mahakali. Generally, fishermen and fish producers sell their product directly through retailers/wholesalers and middlemen. In selling their fish farmers have three options, i.e. selling to the consumer at the local market, selling to an Indian agent, and selling to wholesaler through contractors. About 28% of the total catch is consumed or given away by the farmer, and 30% is sold directly to consumers. About 42% of the total catch/harvest is purchased by wholesalers from contractors and

distributed to retailers in the major urban centers. New markets are emerging worldwide. As high value species are increasingly exported (intra- or interregional) and low-value products are imported, there is an increasing need by aquaculture farmers to improve and facilities access to export markets.

The choice of species produced may also increasingly be directed toward higher value strains that have export potential. With the more stringent demands of export markets, small- scale operators are facing increasing difficulties in producing aquaculture products for export and may leave the sector as they become uncompetitive. The regional aquaculture trends reviews indicate various responses by governments to market issues that have a significant impact on the aquaculture sector. They are mostly geared towards the small and poor farmers while generally they are aimed at improving the country's competitiveness in foreign markets. In some countries, the latter tends to bias support to the commercial, especially export oriented farmers, but generally resulting in more efficient and, in many cases responsibly managed production and processing of aquaculture food products. A study of China's fundamental and broad-ranging fisheries policy change to align with world trade organization (WTO) rules shows how a country's broad-ranging adjustment to the WTO framework can have positive impacts on its fish farmers .

Generally the market is understood as the place or geographical area where buyers and sellers meet and enter into transaction involving transfer of ownership of goods and services. In simply we know that the marketing is the process of buying and selling goods and services.

#### **4.13.1 Role of Agricultural Marketing in Economic Development**

In an agricultural country like Nepal , marketing is the combination of activities by which agricultural produce and raw materials are made ready for or capable of consumption and reach the final consumer in a suitable at time and in the place he want them. Efficient marketing of farm produces has been realized as a must in the process of economic development of an agricultural country like Nepal. Majority of Nepalese people belong to the subsistence level. In such a subsistence economy the expansion and development of marketing is desired for the sake of better standard of living of the masses. However, a subsistence farmer may have to sell greater volume

of its farm products to meet daily necessities produced in the non-farm sector, whenever, prices of his farm products are low.

Agricultural marketing is a far more embracing term than industrial marketing. "In providing an efficient link between consumer and producer, the marketing system must function to faithfully reflect back to the producer the demand of the consumer, to provide the facilities, organization and practices required, to provide the incentives necessary to get the farmer to produce for the market to undertake the physical movement of produce from the point of production to the point of consumption, to transform the product so as to conform to consumer demand, and finally to undertake the holding of the product from the time it is produced until it is sold on the market." (Marketing and Economic Development,- "Agricultural Producers and their Market." (Edited by Warley, pp 75).

Marketing consists of series of related activities starting from distribution of agricultural inputs and credits to assembling, grading, storing, transporting, processing and selling to the final consumers through several channels of the middlemen. When we talk of the integrated marketing system we should consider all these aspects. But in our situation, such system is not yet properly developed. That's why proper distribution system is lacking. In order to assure efficient and proper distribution of the product marketing infrastructure and such net work should established in time. In the present of organized market, farmers can dispose their product in time at fair price. In such situation, farmers will be interested to produce more leading to the economic development. Thus efficient operation of agricultural marketing plays an active role in developing our agricultural economy and as a result in overall economic development.

#### **4.13.2 Present Market Situation in Kailali**

In Kailali, there are some public corporations. They are helping to enhance the agricultural market. These public corporations are in Kailali area. The marketing of agricultural commodities is not well developed. The role as well as technique of marketing in its totality has been traditional. After 1960, the change is found to have appeared the opening of public sector Corporation to land the helping hand in growth of national economy. Agricultural input Corporation, National Trading Limited, Jute Development, Agricultural lime stone Industry, Nepal Transport etc. were established.

The opening these corporations have led to expand the product market as well as the demand potential, to further influence the supply factor.

National Trading Limited, Nepal Khadya Sasthan, Salt Trading Limited, Agriculture input Corporation Ltd, National Seed Company, District Agriculture Development Bank, District Agriculture Development Office, Irrigation Office, and Fisheries Development Office. There are many market points in Kailali, due to transportation and other facility available than other district of FWDR, many small businessmen are working in fish and other agricultural marketing. Dhangadhi is the main market of Kailali. The entire agriculture products collect in this market from the local market. Local market of Kailai is as flows:

**Table 4.18 Main local market in Kailali,**

S.N	Market name	Distance from Dhangadhi (km)	Transportation facility
1	Masuriys	47	Bus
2	Chaumala	36	„
3	Sukhad	59	„
4	Attariya	16	„
5	Malakheti	20	„
6	Bhajani	77	„
7	Phulwari	20	„
8	Joshiपुर	76	„
9	Hasuliya	30	„
10	Khandada	38	„
11	Phaltude	69	„
12	Satti	104	„
13	Tikapur	95	„
14	Chisapani	93	„
15	Lamki	79	„
16	Chuha	70	„
17	Sadakpur Bauniya	68	„
18	Pahalmanpur	52	„

Source: Sudur Pashchimanchal Bus Byabsaya Samitee Dhangadhi.

Beside of them there are other many small local market in the district where fish and other agriculture products are selling and buying. The above table shows that every market has transportation facility. Every one can reach there by vehicles like bus, truck, tractor and other small vehicles. The transportation facility helps to enhance and encourage the farmers, businessmen for development of marketing.

In this district, there is operation the agricultural product Hat Bazaar. They are

**Table 4.19 Description of Agriculture Market and Collection Center**

<b>S.N</b>	<b>Krishi upaj Haatbazaar</b>	<b>VDC/MUN</b>
1.	Chaumala	Banbehada
2.	„	Chaumala
3.	Joshiपुर	Joshiपुर
4.	Masuriya	Masuriya bazaar
5.	Attariya	Geta-4
6.	Tikapur	Tikapur- 9
7.	Dhangadhi	Dhangadhi MUN-1
8.	Dhangadhi	Dhangadhi MUN-2
9.	Lamki	Baliya
10.	Urma	Urma, Bhada
11.	Nigali	Nigali
12.	Sahajpur	Sahajpur Bazaar
13.	Khanidanda	Khanidanda Bazaar
14.	Ramshikharjhala	Ramshikharjhala
15.	Munuwa	Munuwa Bazaar
16.	Bhajani	Bhajani bazaar
17.	Durgauli	Durgauli bazaar
18.	Pathraiya	Pathraiya bazaar
19.	Sukhad	Sukhad Bazaar
20.	Fulwari	Fulwari Bazaar

Source: Field Survey

Agriculture tools, fertilizer, fingerlings and capital are most essential thing for fish and other agriculture cultivation. Many agro vets co-operative institutes, fishery

center, dialers are working in the Kailali, that have been providing agricultural and Marketing loan, agricultural tools, fertilizer, fingerlings, water supply and technical support. The following table shows the number of institution working in field of agriculture to support them in Kailali;

**Table. 4.20 Agriculture support organization in Kailal:**

S.N.	Organization category	Number of organization
1	Fisheries development center	1
2	Agro vets	70
3	Fertilizer seller	180
4	Co-operatives	75

Source: Field Survey

The above organizations are working for the support of farmers. In the case of co-operative, 60 co-operatives are in active and 15 are in inactive. Most of fisheries and fish seller of Kailali are operating their business with the credit help of financial institute. Most of fisheries have a credit from joint venture bank and middle and small fisheries have a credit from government bank and other bank. In the case of loan disbursement, according to quantity, ADBN has covered more area.

Bank are increasing and enhancing the marketing of Kailali district with the help of credit. The consumer's demand for fish is spread over the whole year. Thus farmers have to store the harvested fish to the fish available at the desired time. But in the lack of storage facility farmers are forced to sell off their product soon after the harvest is over and middlemen takeaway a huge portion of their profit. A farmer and seller in village in generally poor and the unit volume of transaction are very small. Individually they can't have bargaining capacity. Under such condition they can't sell the products at better price. So they have to introduce their business on the behalf of big seller or businessmen of agricultural products.

Though there are some institutions for marketing government efforts are unbalance between production and marketing. Many efforts have been done and are still being done in production side such as irrigation and extension but not enough attention has been given to market side. That is why present marketing services are as traditional as

there were before the outcome of co-operatives and other institutions in the public sector. Problem of inadequate market information still exist, which hampers the development of organized market.

#### 4.13.3 Fish Market at a Glance in Kailali:

Particulars	Market Kailali	Remarks
No. of fish vendors	50-80	90-120kg/ vendor fish sold at Hat bazaar in Tikapur 5-7 quintal fish consumed at Hat bazaar in Dhangadhi.
Types of fish sold	Common carp, Grass carp, Bighead carp, Silver carp, Bhakur, Rohu, Naini and catfish.	3.6-4 quintal fish twice a week comes to Dhangadhi from India. Grass carp preferred to other fish. Fish from Karnali river preferred to pond fish.
Fish price Rs/kg	<u>Dhangadh:</u> -Common carp, Grass carp, Bighead carp, Silver carp, Rohu, Naini, Bhakur = Rs. 150-165 and catfish = Rs. 200-230. <u>Tikapur:</u> -Grass carp, Bighead carp, and Silver carp = Rs. 90-110, Rohu, Naini and Bhakur = Rs. 110 and catfish Rs. 130	Smaller size of Silver carp and Bighead carp has less demand as compared to the larger size. Common carp, Grass carp, Rohu, Naini and Bhakur sell at a higher price as compared to other carp. Catfish cost higher than other fish.
Estimated fish sold (kg/per vendor/ day)	50-80 kg once in Tikapur Hat bazaar (twice a week Hat bazaar). Average 45 kg/ day in Dhangadhi.	
Fish import and export	About 60% fish come from India.	Send to Dhadeldhura and Doti. Fish come from India but prefer Nepalese fresh fish. Fish production inside country not enough to meet the demand.
Total average fish sold (kg/day)	1000-1500kg	Figure is based upon fish sold by traders only and not by individual farmers at the village level

Fish (including the ones imported from India) has a market of almost eighty five thousand rupees/day in the summer at the main market such as Dhangadhi and Tikapur and about three hundred thousand rupees/day in the winter. (Source: Field study and interaction with traders of Lotus Intellect Pvt. Ltd.)

#### **4.13.4 Existing Fish Marketing Situation in Kailali:**

Marketing is the process of planning and exchanging the conception, pricing, promotion and distribution of ideas, goods and services, to create exchanges that satisfy individual and organizational goods. Marketing encompasses all the activities aimed at satisfying the needs of the customers through the exchange relationships to achieve organizational objectives with social responsibility in a dynamic environment. In this chapter, I will try to express about the various activities adopt in marketing system of Kailali which is concern to fish marketing.

#### **4.13.5 Role of the market Chain**

The efficiency and nature of the market chain impacts significantly on the margins of producers and the price and availability of fish to consumers. In many part of country, a post-harvest loss in capture fisheries exceeds 20%. This has a double impact on food security; it reduces income and the total supply of fish to consumers. Because of weak market infrastructures and facilities in rural areas, much of the captured fish is marketed as dried or smoked products. Local public and private investment are needed to support small-scale marketing initiatives in this areas leading to higher income and a greater supply of quality fish to consumers. This would stimulate rural development and provide economic opportunities for women traders.

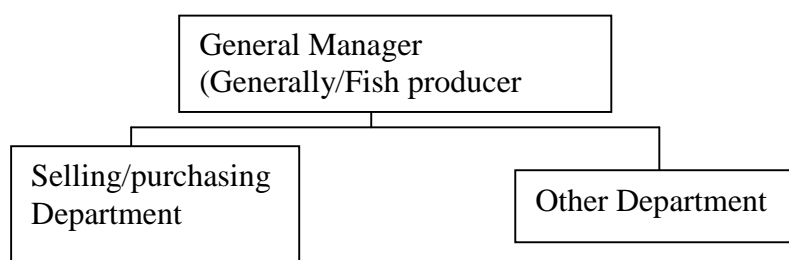
As the Latin America and Caribbean review illustrates that market chain for aquaculture products varies according to production volume and the distance between production centers and parts or export exit points. Small producers sell their products at the farm-gate of the nearest population centre. For the local market, rural sector supply chains are oriented from the producer to the selling point, while at the national level the processor and intermediaries are introduced. Larger enterprises often own products and transfer then to the "broker", even in the country of destination. For larger outputs, products are transported to the nearest cities that have cold storage facilities and processing plants. Prices are lower due to larger volumes handled. Large farms harvest for their redistribution. The marketing of aquaculture products is carried out in supply centers, chain stores and supermarkets and in some instances in selling points that belong to the producers or the processing plants.

#### 4.13.6 Marketing Department

Generally, if we see the selling and purchasing activities of fish in Kailali, we can define the marketing department in only local market. They have selling and purchasing department that all the marketing factions are ruling by it.

So, I can say that is the simple sales department organization. We can see it in the figures,

**Fig. 4.11 Fish marketing department of Kailali**



In Kailali, marketing departments are not organizing as the concept. But it can say they have been adopting functional organization.

#### 4.13.7 Marketing Environment

Marketing can be affected by internal and external environment viz, product, price, place, promotion, organization objectives, polices, resources, structure and political, economic, socio-cultural and technological factors.

The fish marketing of Kailali is also affected by several factors. Farmers of remote area has low source of income. So they are to sell their product in low.

#### 4.13.8 Market Segmentation and Market Coverage

The fish market segment of Kailali is defined in one type, which is consumer market.

The marketers or sellers purchase fish from framers and then they sell it into final consumers. These types of seller are located at high population density where the fish user. This type of market segment is effect by geographical and behavioral variables.

If we want to know about the fish marketing coverage of Kailali, it can be divided in to two parts;

1. Local market coverage and
2. District market coverage,

There are many small sizes of fish seller and purchaser in remote, rural area and production area. They collect fish from farmers directly and sell in to village to village (door to door).

Some fish baypari are collected fish from farmers then sell in to cities like Dhangadhi, Attariya, Tikapur.

#### **4.13.9 Marketing Channel**

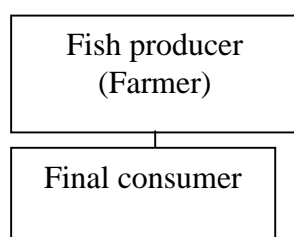
According to Prof. William Stanton, distribution channels consist of the se of people and firms involved in the transfer of title to a product as the product moves from producer to ultimate consumer or business user.

In the fish market operation of Nepal, there are large sequences of intermediaries, A majority of the farmers are not aware of the prevailing malpractices in the market, which help he middlemen to obtain more benefit in fish trade. The fish marketing channel of Kailali are divided into flowing part; Channel structure of fish marketing in Kailali for consumer products:-

##### **Zero level channels-**

In this level, the fish producers of farmers sell their product to final consumers directly. This can be seen in flowing figure.

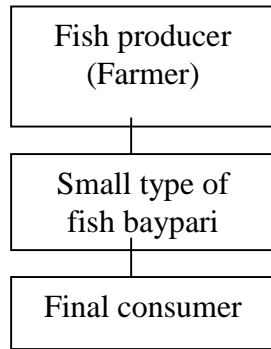
**Fig. 4.12 Figure of zero level channel for consumer market fish.**



##### **2. One level channel.**

In this channel, small types of fish sellers have been working between fish producer and final consumer. They are small type of fish collector, who purchase fish farmer and sell in to final consumers. It can be seen in flowing figure;

**Fig.. 4.13 gure of one level channel for consumer market of fish**



There is only one type of channel structure of fish marketing in Kailali.

#### **4.13.10 Fish Pricing**

The principal function of agricultural marketing is to determine the price of every agricultural product from its farm gate to its consumption stage. Fair and reasonable pricing system of agricultural production is one of the most effectively encouraging criteria to the products and consumers as well.

Price stability is an important thing. But in our country, price of fish is moving up and down over the periods. It is the same problem of Kailali district. There is not strict rule and pricing policies that compel the people to follow the price rate exercised by the businessman or traders. In general, agricultural products often receive low prices for their products because they are obliged to sell them in the market at a time when supply exceeds demand. Moreover, storage facilities are inadequate both in number and capacity. The working capital of producers and merchant is limited. Thus, the bulk of marketable surplus move to the market within 2 or 4 weeks of the harvest periods. Price trend is to be the lowest during this period and reach their peak during the planting and before the monsoon.

The main problem of pricing in Kailali the farmer or producer, who are actual owner or first marketer, have not effective role in price determination. They have to sell their product in the price that determined by fish Baypari. They are not getting reasonable price in the ratio of profit abating by fish Baypari. Whole the market of fish is affected on behalf of fish Baypari or middlemen.

#### **4.13.11 factors affecting Price Determination**

Price is the exchange value between what the buyer get and sellers receive and determining the price is called pricing. Price Impacts financial performance and is an important influence on buyers perception and positing of product. Several factors influence management's decision's about how price will be used in marketing strategy In order to determine the proper price for product. Both internal and external factor are taken into consideration.

**A. Cost:-** Cost must be an issue while determining price of fish farming. If the cost is high, price will be high. Higher Production cost, cost of labour rise etc. make and fix the price of the fish Distribution cost and promotion cost also raise the price of fish product. After calculating all types of costs cretin margin is added to determine the price.

**B. Distribution:** The price of fish is also influenced by distribution channels. Long channel increases commission cost of middlemen. It forces to raise price. Transportation cost also affects pricing directly.

**C. Market Demand:** Pricing is directly affected by market demand, where as fishery market of Kailali district also affected by demand and supply of fish. If affects prices determination to a greater degree. Higher the demand higher the prices and lower the demand lower the price. It is the greatest principle of determination of price.

**D. Competition:** In today's global marketing environment, competition also plays a leading role while determining price of fishery market. The key component generally fishes their prices similar each others production, When they produce similar fishes. In the contest of Kailali district the fish producer have to face the competition with the Indian fish imports. In the basis of import the farmer determine the price of fish.

#### **4.13.12 Profit Margin**

The data are collected by questioner and discussion to the farmers, small fish Baypari. According to them farmers are getting proper profit. They only getting profit to recover the production cost and sometime they have to loss. The fish Bayparis are getting little profit. They collect fish directly from farmers and sell it to village to village or door to door and cities in little profit (near 10 to 15%).

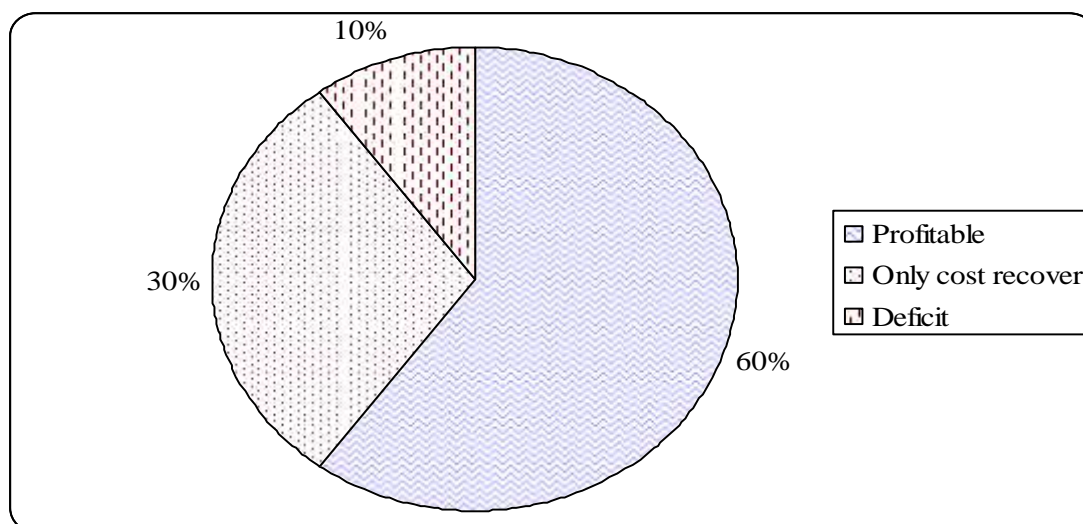
For this study, the data are collected to know the profit margin situation of fish in Kailali. The data are collected in three categories like fish Baypari is profitable, deficit and expenses coverage, the following table shows the profit situation provided from survey.

**Table 4. 21 Profit Margins in Fish Baypar.**

Profitable	Only cost recover	Deficit	Total
60%	30%	10%	100%

From above table, 60% of fish seller express that fish Baypari is profitable. 30% express that fish Baypari is no profitable. It is only cost recover. 10% fish Baypari or sellers express that fish Baypari has no profit, it has deficit

**Fig. no. 4. 14 Profit Margin on fish Baypari in Kailali.**



#### **4.13.13 Transportation**

Transportation is one of the important factors of marketing. The development of the country is also depending to transportation facilities. Without the transportation facilities, producers can not carry their products from production centers to marketing centers. Thus, transportation has its own importance in the function of physical supply of commodity.

Kailali is a Terai district. So, it can be easily carried products one place to another place with any means of transport. The graveled and temporary roads are linked one

corner to another corner of the district. The government has also forest and going to build the agricultural roads in different area of district. Some defined agricultural roads are as follows;

**Table.4.22 Agricultural road in Kailali district:**

S.N.	Name of Road	Length of the Road
1	Gulara to Gadariya	10km
2	Rajipur to Gadariya	9km
3	Joshiपुर to Lalboghi	15km
4	Sukhad to Khairala	18km

Source: Field Survey, 2070

The black top road is also connected the difference part of the district. Mahendra Highway which links the whole nation, Bhim Datta Marg, Tikapur Marg, Dhangadhi Attariya Marg is located in this district. Kailali is established as the market of Far West Region and success to take a place as one of the marketing point of the country.

#### **4.13.14. Transportation System**

The transportation system, using by the fish Baypari is defined in three types. Transportation tools are using in local market of remote area, local market of city area and export to another area.

The nearest market of remote and village of Terai area, the fish Baypari usually to carry fish bull cart, truck, tractor, bus, cycle etc. From the data collection, it is found the use of vehicle for caring of fish is as follow;

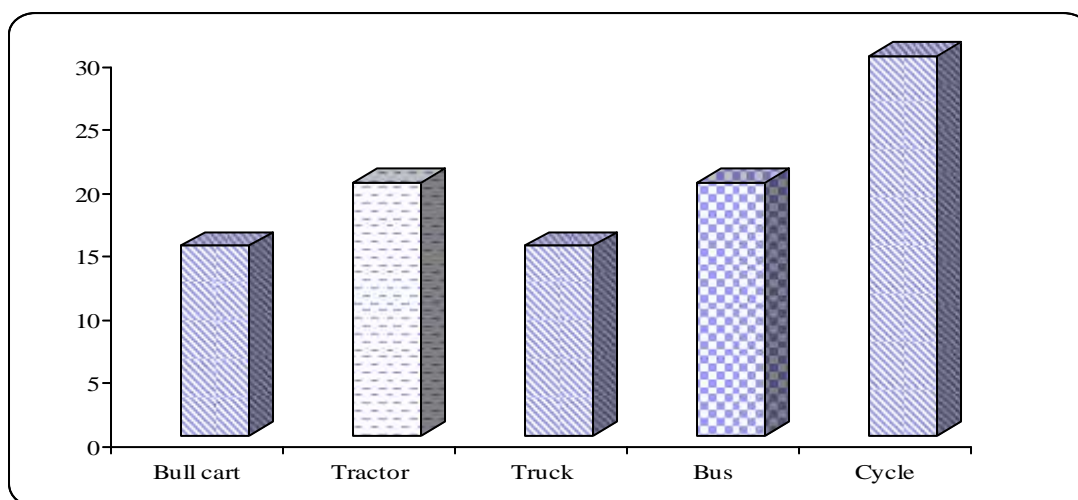
**Table 4.23 Use of vehicle is in remote area of Kailali for fish.**

S.N.	Option	Percentage
1	Bull cart	15
2	Tractor	20
3	Truck	15
4	Bus	20
5	Cycle	30
	<b>Total</b>	<b>100</b>

Source: Field Survey, 2070

In the above table we find that 30 % of the fish is supplied from the remote of this district by cycle, 20% by tractor, 15% by bull cart, 20% by bus and 15% by truck. But we can know that mostly of the fish are supplied to the remote by bus and tractor. The above table can see in the following figure.

**Fig. 4.15 Use of vehicles in remote area of Kailali is for fish;**



The nearest market of city area of Terai area like Dhangadhi, Tikapur, Attariya the fish Bayapari usually use to carry fish Rickshaw, Jeep, Tempo, cycle. From the data collection it is found the use of vehicle for caring of fish are as follows;

**Table 4.23 Vehicles are use in city area of Kailali.**

S.N.	Option	Percentage
1	Rickshaw	20
2	Jeep	45
3	Tempo	20
4	Cycle	15
	<b>Total</b>	<b>100</b>

Source: Field Survey, 2070

The above table that 45% of the fish is supplied in city area of this district by Jeep, 20% by Rickshaw, 15% by cycle and 20% by Tempo. By, this we can know that most off the fish are supplied in city area by jeep and Rickshaw. But, in the hilly area of this district, bus, horses and men are used as transportation tools.

#### 4.13.15 Transportation cost

According to survey, the transportation cost of different vehicles in Kailali district is as follows;

**Table 4.24 Average transportation cost of fish in local area.**

S.N.	Means of transportation	Transportation cost (Rs/Quintal)
1	Bus	30
2	Tractor	25
3	Truck	35
4	Tempo	30
5	Jeep	35
6	Rickshaw	25
7	Bull cart	10

Source: Field Survey, 2070

The above table shows that the transportation cost per quintal of fish. The rate of truck, tractor, tempo, jeep, bus have same rate. But the jeep, truck and bus are rarely used for transport. Into the market area, like Dhangadhi, Tikapur and Attariya rickshaw is used by customer, some businessman for a few goods. Other wise truck, tractor and bull cart are used. The farmers are used bull cart for transportation of fish. In the village area the main transportation means are bull cart and cycle. The businessmen and villagers say that they are very useful to us because they can easily available, cheapest and they can drive every where and any kinds of road.

#### 4.13.16. Constraints and Services

##### **Constraints;**

- 1) Slow growth rate, which result in a slow reunion investment if cultured.
- 2) Past neglect of sound management of fish stock and fishery; his is led to number of problems comforting the present fishery administration:
- 3) Small number of pond, lakes and reserves. Shortage of trained manpower.
  - Low level of management activity.

- Low level of research, specially on fish production.
- 4) Limited access to fingerlings hampering the production of fish. The farmers sell their produce in villages on credit, which may result in not being able to procure fertilizers and pesticides on time
- 5) There is poor co-ordination of farmer with DADO and FDC.
- 6) The farmers harvest fish well before the harvesting season, leading to them getting underpaid for their product. They harvest well before time because there is demand for fish from the villages all time.
- 7) Lack of knowledge on farm nutrient recycle, on farm resources and kitchen wastages resulting in high cost of production.
- 8) Lack of access to water in Tikapur has hampered the growth of fish leading to loss for the farmers.
- 9) Poor soil quality and high evaporation rate during dry season has resulted in low water levels. This result is poor growth of fish and the farmers have to work extra hours. These extra hours are substituted from other agricultural farming.
- 10) There are no water quality testing technicians within the project area, and hence farmers are not aware regarding how much of fertilizer, feed, oxygen is required for optimum quality production
- 11) There are no traders at the village level; therefore farmers by not being able to sell the same at markets such as Dhangadhi
- 12) There are no feed markets in the project area, which results in low quality of feed for the fish leading to low production in terms of size and weight.
- 13) Absence of association leading to poor bargaining power, poor training access, market linkages etc. leading the farmers to sell their produce at lower cost.
- 14) Due to the Limited availability of financial services the fish farming cant raise in kailali dstrict.

### **Services/solutions**

- 1) Facilitate linkage between farm and private, government hatcheries such as FDC for sustainable supply of fingerlings.
- 2) Develop and strengthen private service providers for timely supply of fingerlings to the farmers.
- 3) Identify a farmer in each pocket area to develop and maintain nursery for supply of fingerlings of appropriate size.
- 4) Facilitate linkage between farmer groups and cooperative to access micro- credit.
- 5) Facilitate linkage between farmers and local traders for supply of fish in cities such as Dhangadhi, Attariya and Tikapur.
- 6) Identify, train and develop linkages between water testing export and farmers.
- 7) Provision of local linkage to trainings regarding harvesting techniques.
- 8) Awareness creation regarding fish keeping for optimum production and price.
- 9) Develop alternative source of water.
- 10) Access to training on retention of water (for example, clay coating effecting use of feed and fertilizer).
- 11) Identify, train and develop local service providers and provide tools and equipments such as weighing balance, ice box, fishing net, etc.
- 12) Identify, train develop linkages between feed makers and farmers.

#### **4.13.17 Major Players and their Functions**

The following are the major actors and their functions as depicted by the fish production map and its description above.

**Producers:** These are the farmers supported by the project for the production of fish and vegetables in the dykes. They gather input such as fingerlings from the nurseries and hatcheries for production. They harvest these fingerlings after 10 months and sell the same in the villages only. They do not take their

produce to the main markets such as Dhangadhi, Attariya and Tikapur. Some times the farmers harvest well before time leading to loss of produce and income

**Agro vets:** Agro vets are the suppliers of fertilizers, seeds, agro tools and pesticides within their locality, while analyzing their role in the fish sub-sector; they supply fertilizers, feed and provide professional technical service to the producers of fish. They have good relation with various organizations involved in the fish sub-sector.

**Input suppliers:** These are basically suppliers of different inputs required by the farmers for production of fish. These include fingerlings of various sizes. The suppliers are nurseries, hatcheries. These nurseries and hatcheries include both government and the private, like the Fisheries Development Center in Kailali. It is with these suppliers the farmer groups in Kailali need access to for raw materials.

**Local traders:** The local traders do not have any relation with the farmers supported by the project. This is because the produce of the farmers is consumed in the villages itself. The traders instead go to India to buy the fish and sell the same to major markets such as Dhangadhi, Attariya and Tikapur. To be able to substitute Indian fish with fresh Nepalese fish, these traders are the key for market penetration.

**GO/NGO:** There are various GO/ NGOs working in the fish sub sector in Kailali. There are Fish Development Center, CEAPRED, etc. They are aiding fish sub sector in various aspects such as technical support (disease management, etc) digging of pond, linkages, etc. The strategic partners in this project provide technical support, market linkages, training, etc, for farmer groups.

Retailers: There are no wholesalers and therefore retailers have all the access to major markets. The retailers directly supply to the end consumers. These retailers are stationed in Dhangadhi, Tikapur and Attariya in Kailali. These retailers sell 60% of Indian fish in Kailali. The fish from Nepal is consumed locally, that is in the villages as no traders linking the farmers with these retailers. These retailers sell their produce during the weekly Haat Bazaar too.

#### **4.14 Creating Opportunities for Participation of the Poor**

Due to the lack of capital, poor people can not address their needs for aquaculture interventions. Aquaculture, the argument goes, requires resources such as land, ponds, water, credit and other inputs, by definition those involved in aquaculture are not the very poor. In this regard, an FAO/NACA consultation in 2002 collated experiences that clearly demonstrate that if aquaculture is properly planned there are considerable opportunities for poor people's entry. First, the consultation agreed that aquaculture offers significant advantages over other activities such as livestock and crop farming for the entry of poor people because it entails low-cost technologies using available on-farm inputs is a low-investment and low-risk activity, requires low labour inputs that fit with household divisions of labour is easily integrated into other livelihood and farm activities, and low levels of production provide important sources of household nutrition and buffers against shocks.

From experiences and lessons derived from various development projects implemented by governments and civil society organization in several developing countries (Bangladesh, Cambodia, India, Lao, Nepal, Philippines, Thailand and Viet Nam), the consultation recommended measures for appropriate targeting of poor people, targeting the landless, creating opportunities for the poorer people, targeting the women, strategies for collective action, caution in providing subsidies and gratuities and adopting livelihood approaches.

Few aquaculture development initiatives reach the poorest. When aimed at poverty reduction, development assistance should be targeted carefully by clearly defining the

intended beneficiaries and devising appropriate strategies to help them features of poverty among the intended beneficiaries, including the means of overcoming key barriers for entry into aquaculture and adoption of technologies, and to mitigate risks to which the poor are particularly vulnerable. The ADBM studies of small-scale freshwater aquaculture in developing countries like Nepal, yielded strategies for targeting the small and poor households, as follows.

**1) Access to land water:** - Access to land and water is the key requisite for fish farming. Conventional aquaculture development initiatives that emphasize the promotion of technology and provision of targeted extension services are unlikely to reach the functionally landless and the extremely poor. Without access to land water resource or water area the poorest are unlikely to engage in fish farming directly.

**2) Access to other livelihood assets:** - Access to financial and human capital assets is necessary for households to benefit from aquaculture. The ability to pay for pond development and fish farming, including seed and feed, requires financial capital, access to credit, or both. Human capital, in terms of basic education and capacity to learn, is required for people to gain from training and extension services.

**3) Leasing a pond:** - When the landless gain access to water bodies or ponds through lease or other access arrangements for fish farming, secure access rights are critical. Eviction is common when access is not secure, and interrupted operation can result in loss of investment that the poor cannot recover from. Demonstrated profitability of fish farming may also increase the lease price of ponds beyond the reach of the landless because of an increasing demand for fishponds. Further, the profitability of fish farming may entice landowners to operate fishponds on their own or through caretaker arrangements.

**4) Pond sharing:** - With a large number of dependents per family (typically, a family has 5-8 members), land inheritance leads to a multiple ownership of fish ponds, presenting an array of issues related to co-ownership and collective action among shareholders. Cost sharing benefit distribution and assignment of responsibilities and accountabilities for pond management become difficult leading to underutilization and even abandonment.

**5) Living marginally with risks:** - Most direct beneficiaries of fish seed and grow out technologies in Nepal are not the poorest people. Small-scale landholders with fish ponds may have limited assets and may not be categorized as marginally poor or the poorest, but most small-scale landholders are only precariously above the poverty line.

**6) Labour and cash inputs:** - Some socio-economic constraints remain even for those able to secure access to land or water bodies: several hours of daily labour may be required for food gathering, preparation, and feeding; while return from fish farming are often highly seasonal. Feed requirement cannot always be met by pond fertilization and collection of feed from the immediate vicinity. Supplementary feed may require cash outlays. Lack of cash and difficulties in accessing credit are major barriers for the poor to undertaking aquaculture on their own. Although labour may be shared and minimized through collective action among farmers, organizational arrangements are not easy to meet.

**7) Theft:** - Fish pond owners and cage operators often face the threat of poaching. The risk of theft increases when fishponds or cages are far from farming's households. Surveillance requires labour inputs for which the return is not immediate. These constraints have limited the feasibility of fish farming to some extent, especially among households headed by females, who, on their own, are unable to protect their assets against an unfavorable social environment.

#### **4.15. Fish marketing strength, weakness, opportunity and threats**

##### **Strengths:-**

- ) Productive area
- ) Several small types of fish market
- ) Irrigation facility

##### **Weakness:-**

- ) Uneducated farmers
- ) Import from India
- ) Lack of adequate infrastructure
- ) High interest rate

) Lack of motivations to farmers and government effort

**Opportunity:-**

) Unlimited market

) Transportation and communication facility

**Threats:-**

) Indian market

) Organization of market

**Opportunities:**

- i) Demand for fish has increased since the last 1 year due to the increase threat of bird flu. Mutton cannot be substituted for fish, as mutton is clearer in terms of money to the ordinary people.
- ii) There is huge potential in terms of import substitution. In Kailali 70% of fish is imported from India. Through various training and awareness creation on aspects such as disease management, harvesting techniques and season, availability of fingerlings, the product of the farmers can substitute the fish imported from India.
- iii) There is a need to increase the quantity of fish so as to capture the main markets of the above Kailali districts. At present, fish from the villages do not reach the major towns and cities of the districts.
- iv) There is a possibility of off – season vegetable farming on the dykes of the pond.
- v) There are various I/NGOs supporting this sub sector technically as well as financially. There are also GOs such as Fisheries Development Center within and around the districts, which supply fingerlings. Since the district is adjacent to the Indian border, the inputs including fingerlings can also be imported as and when required.
- vi) Since farmers work in groups, it is easier for them to form an association through facilitation by the strategic partners in the respective districts.

- vii) Farmers should have direct linkages with traders for maximization of profit and penetration of the major markets. The project should facilitate in establishment of traders for better bargaining power for the farmers and penetration of the major markets.

## **CHAPTER V**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Summary**

Nepalese economy is predominantly agricultural. Agriculture is the backbone of the Nepalese economy and nearly about 40% people belong to the below poverty line, where about 80% people engage in agriculture, is an agricultural country. It is divided into three parallel geographical zone running east to west. 15% area of country contains 16 district cover terai area.

Kailali is the most important district in the view of production and agricultural market, where 80.4% people engaged in agricultural. All the rural area of this district take important place for production and Dhangadhi, Tikapur, Lamki, Attariya, Sukhad, Bhajani, Phulwari, pahalmanpur, chaumala etc. are main market point and other several small market are located in the district.

The data and information collected by means of the questionnaires are presented, interpreted and analyzed so as to attain the stated objectives of the study. Primary data are randomly sampled from farmers, small fish Baypari and final consumers. In totality 100 samples are selected. Secondary data are selected from different institution like DADO, NSC, ADBN, I/NGOs and various books, news papers Articles, booklets and internet published and unpublished thesis. Most of data are collected with of help the questionnaire and discussion methods, and suitable format are used for collecting data.

Most of the presentation and analysis are made on primary data and same are used secondary data, The analysis shows that the cultivated area and productivity of fish have been increasing every in zig zag way. The figure shows the current average yield rate of fish 3.7mt/ha in Kailali.

Although, Kailali is a production area, but 450 mt of fish is still requirement which is fish requirement. The DADO Kailali, has recommended various fish varieties, but farmers are heavily used Silver Carp, Common Carp, Grass Carp, Beghet Carp and Rohu. Farmers are adopting traditional and modern farming system, but traditional system is used more them modern.

For promotion of agriculture sector there are many public corporation, small and local and main market point in different area of district, above 25 Hat Bazaar located different parts of district. 65 agro vets, 175 fertilizer sellers and 70 cooperatives and about 25 branches of different financial institution.

.The many parts of the kailai is covered by tarai. So the fish market of this district is affected by Indian fish market. The market of fish covers local, district and national market. The coverage is affected by different channels of marketing. It seems the Indian market in price determination of fish. The research shows that the marketing departments are not organizing as generally General Manager. The current fish purchase price is Rs. 150-200 per Kg and selling price Rs. 200-300 per Kg in season and off season. Farmer can not get proper profit from fish. Every where in the terai belt, the transportation facility is a viable rickshaw, tempo, bus, truck, tractor, cycle and bull cart are used for transportation and tempo, bus and cycle is used more than other vehicles in local and district market. But is used for external market maximum transportation cost is Rs. 25 per quintal in local market but different rate in long term district. Only 65% people express it is profitable, 30% only cost recoverable and 5% deficit. There is no modern storage facility to the farmer and small fish Byapari.

## **5.2. Findings and conclusion**

The per capita consumption and contribution of aquaculture and fisheries in agriculture gross domestic production is low (1.9%). This is due to inadequate priority for the promotion of the fisheries and aquaculture sector in national policies and implementation, inadequate skilled human resource, awareness and affected training mechanisms.

The conclusion of major finding of the study is as below:

- i) Nearly 84.5% people based on agriculture in Kailali district.
- ii) Taria area of this district is best for fish farming and has high production besides of hilly area.
- iii) Elimination of Kamaya Partha effects production and productivity of agriculture, 12023 Kamaya families (84164 populations) are eliminated.

- iv) 25 different bank branches in addition to 6 loan branches by ADBN. Ltd. Are located in different part of this district.
- v) The research shows that 90 % of total institution loan is served ADBN. Big fish byapary has been taken loan from joined venture bank that is bellow 10%.
- vi) The production trend is increased in straight line and production is increasing and decreasing in zigzag. But the change in both production as well as area cultivated do not proportionate. Some year production is increase but decreased in cropland. But can't be proved that relationship between cultivated area and production is negative.
- vii) The farmer gets Rs 2000 net return in natural pond and Rs 7000 in artificial pond improved fingerlings in Kailali district.
- viii) The fish requirement of this district is 57.14%, but it has been decreasing every year due to the increasing in production.
- ix) Many types of fish are recommended by DADO. But must of the farmar used improved fingerlings verities like common carp, grass carp, beghet carp, rohu and naini.
- x) Quality improved fingerlings are made available by FDO, Kailali. It is not sufficient to make reachable to the rural farmers.
- xi) Farmer are not trained about the dose of fertilizer, modern agriculture cultivation system and their argument is, "they are left away from help the GOV. Service."
- xii) Due to the lack of capital and low saving of farmers can't adopt improved method of farming. 40% farmers are adopting traditional farming system and 20% adopting both farming system. The study also shows that big farmers are adopting modern farming system and improved fingerlings of fish. Medium and small farmers are adopting traditional farming system and local varieties of fish.
- xiii) 30% farmer take borrowing from local merchant, 50% from financial institution and 20% use own capital.
- xiv) 20% of total production is destroyed by many kind of disease.

- xv) In Kailali, more than 16 Krishi upaj Hat Bazaar are started in different parts of district.
- xvi) Dhangadhi, Attariya, Chaumala, Pahalwanpur, Lamki, Tikapur, Narayanpur, etc are main market point of fish trade.
- xvii) The price of fish is higher in off season than season. The price of fish is increasing every year.
- xviii) Mahendra Highway and other Highway and other several graveled and temporary road are located in Kailali.
- xix) Mostly Cycles are used to transport fish all over the terai area of the district. Beside that, bull carts are used in rural area and rickshaws are used in city, but truck and jeep are used to supply in hilly area of district.
- xx) The marketing development of fish market in Kailali is selling and purchasing department.
- xxi) Marketing environment of Kailali is mainly effected by India.
- xxii) The fish market coverage of Kailali is defined as local market coverage and district market coverage.

The finding of the study has also shown that the increase in fish production depends on use of chemical, fertilizers, improved seeds, irrigation, technical assistances etc. But still a large number of farmers are not obtaining proper amount of fingerlings, fertilizers at right time and right place. GOV. has more expenditure on agriculture. But farmers are away from Government Services, due to the lack of controlling system in government and above causes.

The Nepali are suffering from low quantity as well as low quality of fish production. Although the total yield per hector is progressing yet, it is far below the target. Besides the unavailability of chemical, fertilizers and improved fingerlings, there are some other serious handicaps which affect the productivity of fish pond. Unavailability of cheap credit, lack of proper market of fish, problem of pricing, storage facility also affect the fish productivity and fish market. ADBN and other bank has invested huge amount in fish production and fish marketing. Food and agricultural marketing service department and many I/NGOs has been contributing a

lot for fish production and marketing. But still there is need of improvement in the functioning of this institution.

In conclusion, Kailali district is the potential area of fish production and there can be so much opportunity and strength in fish marketing in Kailali. But there are so many challenges in fishery market. The government and public sector should solve and remove those challenges and problems lies in fishery market.

### **5.3. Recommendations**

On the basis of this study, some recommendations can be suggested to improve in fishery market . They are as follows;

- a) The farmer are unknown about the fish marketing. So farmers should be aware about modern agricultural technology. For that, education and occasional training must be given to the farmers.
- b) Farmers have low income and they always suffering from the capital. Thus cheap credit and technical assistance should be provided with easy terms and conditions.
- c) Farmers have to provide training about use of fertilizer, improved fingerlings.
- d) It is necessary to manage grow more fish\_campaign in\_different part of remote area of this district by the DADO.And also use better fingerlings campaign should be done by DADO. In fish development program emphasis should be given to raise the quality of fish.
- e) The government has been investing more budgets for the agriculture development. But work is completed too little than the rations of expenditure. The GOV. has to manage a good controlling system of technical staffs and other variance of its subordinate offices like DADO, FDC etc.
- f) Price uncertainty of fish has to be reduced through appropriate stabilization measures. So that, farmers and consumer can be sell and purchase their product in reasonable price.
- g) Farmers have to establish their reference group for the welfare of the farmers.

- h) Government and other sub-ordinate institutions should improve the marketing by providing transportation facilities. There is need to improve marketing by providing adequate transportation facilities by GOV. and other subordinate institutions so that the small farmers can cultivate fish for business purpose.
- i) Storage houses, cold store should be constructed to facilitate the farmers to store their fish and provision should be made to extend credit against their product. In this work, social groups and GOV. can effort.
- j) It is necessary to establish a good net working system of fish market and it should be controlled through the market inspections.

Some recommendation for the improvement in fish production and marketing activities are as follows.

**1) Improvement and established of feed production center in kailali.:**

The feed maker will be responsible for making quality feed by using local ingredients. The maker will then sell the same to the same to the farmers at a reasonable price. The feed makers will also advice the farmers regarding the quantity of feed required for different species and during the entire culture period.

- ) Identify the potential feed markers
- ) Train and build the capacity of feed maker
- ) Link the feed makers with the farmer groups.

**2) Develop and strengthen the water quality testing personnel.**

The water quality testing personnel will provide service for continuous monitoring of water quality of the ponds for maximization of the output. They will also be responsible for PH monitoring, water temperature monitoring, water transparency testing, and identifying fish diseases, The water testing personnel will work in close cooperation with the fisheries technicians.

- ) Identify the potential water quality testing personnel
- ) Train and build the capacity of identified water testing personnel

) Link the water testing personnel with the farmer groups.

### **3) Involvement of local traders in Kailali for supplying fish from farmers to the market.**

One of the major constraints found during the study was the non –existent of local traders in the project area, who could supply the produce of the farmers to the markets. They has led to linkage problems both backward and forward, thereby hampering the growth and profitability of the enterprise. The fish trader would be able to harvest the fish himself from the ponds and sell fresh fish in the nearby market.

#### **The services will be as follows**

- a) Work in close coordination with farmer groups for identifying and developing local traders. This would lead to supplying the fish, to the major markets such as Tikapur, Dhangadhi, Attariya etc.
- b) Provide the identified traders with basic infrastructure like bicycle, icebox, weighing scale for timely and effective transportation to the market.
- c) Train and build the capacity of local traders.
- d) Creation of awareness regarding best packaging methods to the traders

### **4) provision of effective market information and promotion mechanism with a focus on fish.**

The market information system is most important factor for fishery market.it gives information about fish and its market. It interact with various actors, such as farmers, small traders, agro vets etc. Only the retailers in the region are aware regarding the price at the market. On the other hand the farmers as well as to some extent the local traders, lack the end market price.

### **5) Facilitate in establishment of Fisheries Association in each of the cities.**

) The establishment of an association would lead to better bargaining power for the farmer groups, better access to training and easier access to bigger markets.

) In totality, effort and support of GOV, motivation, curiosity and vision of change of social reference group like consumer group, business group, farmers group etc and help of other institution related to agriculture is so necessary to achieve all the above recommendation.

**6) Develop and strengthen the input channel, so that the farmer groups have access to raw materials such as fingerlings, fertilizers and chemicals.**

) Identify the potential farmers for nursing the fingerlings.

) Train and build the capacity of identified farmers on best practices of growing fingerlings.

) Create awareness pertaining to the profitability of this business to the grower.

) Link the above fingerlings grower to the farmer groups.

) Link the fingerlings grower with the hatcheries for timely supply of fry.

**7) Through the training and field study of farmer interest and capacity for better production should be developed.**

a)Development of training package for the farmers.

b) study tour to the well managed ponds for accessing production and pond management .

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## APPENDIX A

### Questionnaire used for Research

Name: Address:

Age: Sex: Date:

#### **Questionnaire to the farmer**

1) What types of fish seeds (fingerlings) do you use for farming?

a) Local                      b) Improved                      c) Both

2) What type of fish caste is getting more production? How?

a) Local                      b) Improved

3) What type of fish farming you have?

a) Pond                      b) Cage                      c) Farming with paddy                      d) Any other

4) What type of technology do you use for fish farming?

a) Tradition                      b) Modern                      c) Both

5) Are agricultural tools, fertilizer available in your local market?

a) Available                      b) Not available

6) What types of water supply do you have?

a) Cannel                      b) Boring & pump set c) Left

7) What types of water supply facilities do you have?

a) Private    b) Group                      c) Governmental                      d) Bank loan.....

8) Where from you collect the production cost?

a) Own                      b) Local merchant                      c) .....bank loan

9) Where do you sell your fish?

a) Local market (distance.....Km) b) .                      istance .....Km)

10) Who determine the rate of fish?

- a) Farmer            b) Fish baypari            c) Government            d) Other

12) What types of vehicles do you use for selling?

- a) Cycle            b) Rickshaw            c) Bus d) Bull cart            e) others

13) How much you pay the transportation cost?

a) Rs...../Kg)

In what rate do you sell your fish?

- a) Rs...../Kg in season            b) Rs...../Kg off season

14) How much you get profit from the fish?

- a) Cost unrecoverable            b) Satisfactory            c) Good

15) Do you get any training of agricultural?

-----

16) How much you are satisfied of your business?

- a) Good            b) Better            c) Best

17) Any problem, suggestion.

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## APPENDEX B

Questionnaire used for Research

Name: \_\_\_\_\_ Address: \_\_\_\_\_

Age: \_\_\_\_\_ Sex: \_\_\_\_\_ Date: \_\_\_\_\_

### Questionnaire to the Final Consumer

1) What type of Fish do you purchase?

- a) Pond fish                      b) River fish                      c) Other

2) Where do you use Fish?

- a) Home                              b) Hotel                              c) Other

3) Where do you purchase fish?

- a) With farmer                      b) Haat Bazzar                      c) fish baypaari

4) What type of Fish do you like to eat?

-----

5) Why do you use fish?

- a) Easy to consume                      b) To avoid appetite                      c) It is healthy

6) How much weighty fish do you like to purchase?

- a) 1 Kg                              b) More than 1Kg                      c) less than I Kg

7) Do you have knowledge about fish?

-----

8) In which rate have you been purchasing fish?

Year                      2066                      2067                      2068                      2069

Fish/ Kg

9) Any suggestion, problem about the market, quality and availability of fish in your market.

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**APPENDEX C**

Questionnaire used for Research

Name: \_\_\_\_\_ Address: \_\_\_\_\_  
Age: \_\_\_\_\_ Sex: \_\_\_\_\_ Date: \_\_\_\_\_

**Questionnaire to the fish baypari**

1) When did you establish your firm?

-----

2) How do you purchase the fish?

- a) Farmer comes here    b) I go to door to door    c) Import from India  
d) All of them

3) What type of fish do you purchase?

-----

4) Where from you purchase the fish?

- a) Local farmer    b) Out of district    c) From India

5) Where do you sell the fish?

- a) Local market    b) Out of district    c) Export to India    d) Other

6) Which varieties do you purchase more and sell more?

<u>Verities of fish</u>	<u>PP/Kg</u>	<u>Sp/Kg</u>
-----	-----	-----

7) How much do you get profit?

- a) Good    b) Medium    c) Expenditure recoverable    d) Deficit

8) How do you sell the fish?

- a) By improving quality    b) As purchase as sell

9) Do you have storage facility? If how much?

-----

10) Who are your main consumers?

- a) Hotel    b) School    c) Local consumer    d) Other

11) Do you consider the consumer satisfaction?

-----

12) Do you have loan to operate your baypar?

- a) Own investment      b) Local      c) -----bank

13) What type of transportation tools do you have?

- a) Own      b) public carrier      c) both

14) Who determine the purchase price of fish?

- a) Farmer   b) Government      c) Fish baypari      d) Other

15) Any kinds of business training have you get? If get where from and what type of training?

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16) How much do you pay the transportation cost?

Means of transportation	Rate/ Kg in local area	Rate/Kg in supplying our side	Supplying in area or place

17) Any problem & suggestion about fish Baypar?

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