

1. INTRODUCTION

1.1 BACKGROUND

In total area of Nepal 1, 47, 181 sq.km 83 percent covers mountains and hills while terai occupies only 17 percent. Nepal has extremely contrast climate and altitudinal variation. Altitudinal variation is greatly influenced by climate of Nepal. Due to the altitudinal effect, the temperature distribution in Nepal is not uniform. It covers snow-clad peaks in the north, plain in terai region, mountainous in south region and in the middle Mahabharata and churia foothills are found. It has warmer low lands like terai, inner-terai and mid lands, cooler in mid-hills and himalayan region. Geographically it possessed different strata. Hence, its climate altitude and geography are extremely diverse. Forest agricultural land and water are the main resources of Nepal.

Nepal is rich in water resources and inland water bodies in the form of ponds and rivers. In Nepal the total area occupied by water is approximately 5, 76, 011 hectors of which pond occupies 6700 hectors (DOFD, 2065/66) and lake occupy 5000 hectors (DOFD, 2065/66) and the rest by rivers. Beside these about 15 00, hectors is occupied by manmade reservoirs.

The concept of organized fish marketing was developed in 1981/1982 (Source: DOFD 2004) with the start of the Aquaculture Development Project. Support services and credit facilities have been extended to the entrepreneurs in the fish marketing business. The fish marketing system seems to have evolved and is self regulating with increasing production and demand.

Though packed fish in ice and chilled fishes are commonly acceptable to the consumer but fresh and healthy fish is preferred by rural local consumer in Nepal. Demand by the urban affluent consumer for processed fish and fishery products is gradually increasing.

Fish traders at all levels from producers to collectors/local middlemen to suppliers and wholesalers to retailers and vendors have developed and operate through organized marketing networks. There are two groups of fish traders involved in fish marketing in Nepal: those from India and those from Nepal. Compared to their Nepalese counterparts, the

Indian traders are well established and organized in terms of manpower, resources and working capability. Fish imported from India and fish produced in Nepal is traded in the fish market in Nepal. These are some of the factors like quality, demand and supply, which determine the fish prices in the market.

Any study has not been reported of fish marketing in Rupandehi district. Rupandehi district, one of the 75 districts of Nepal is the district rich in water resources in fish culture. It lies in the western region of Nepal whose total area is 1, 41,367 ha. This district comes under churia hill, mountain hill and low land terai region. Its elevation is 100 m to 1219 m. It is situated between 27.20' N to 37.450' N latitude and longitudinally 83.10' E to 83.30' E (DADO, Rupandehi, 2070).

1.2 MARKETING SYSTEM

Marketing is the process, in which business activity involved i.e. exchange of goods or services. In another word, all the activities to be performed before buying and selling goods, while buying and selling even after buying and selling are the subject concerned with marketing (Flowara et al. 2012).

The marketing system of Nepal is not well organized. Various studies showed that traders are mostly involved in the marketing system of fish which is in rudimentary nature.

In fish marketing involves all those activities by which fish from its production site is collected and through different channels reaches the hand of consumer.

For marketing fisheries product domestically and for the physical development of markets, infrastructure facilities are most important (Yasmin et al. 2010).

In Bangladesh, infrastructure of wholesale and retail fish markets were not adequate, with regarding to sale area, packaging, sanitation, water supply, drainage, cleaning, washing, maintenance and repair except very few (Flowara et al. 2012).

In Nepal fish marketing infrastructures have been developed in most cities in the terai along with agriculture marketing networks. Kathmandu Kalimati wholesale market centre has developed a fish marketing infrastructure that includes chilled, refrigerated and icing-

facilities. These facilities are used by fish traders at all levels, including middlemen, wholesalers, retailers and vendors on a community and co-operative basis. This model has been successfully operated for several years and is being assessed with a view to wider application in other areas (DOFD, 2004).

The system of labeling / certification of product safety of fish and fishery products have yet not been well developed. However, monitoring of this is done at random by the Municipality, Consumers' forum, Department of Food technology and Quality Control.

1.2.1 FACTORS AFFECTING PRICES

-) Elasticity of demand.
-) The uncertainty supply and demand.
-) Type, weight and quality.
-) Location of fish market.

Demand and supply has direct affect on the pricing of fish like:

-) If demand rises and supply is constant then price rise.
-) If demand falls and supply is constant then price falls.
-) If demand is constant and supply falls then price rises.
-) If rise in demand is greater than fall in supply – the price fall and vice versa.

1.2.2 FISH DISTRIBUTION CHANNEL

The marketing channel (fish distribution) of fish varies in different cities. Generally, the producers sell their product direct through retailers, wholesalers and middlemen. Farmers have three basic options i.e. selling to the consumer at the local market, selling to Indian agent and selling wholesalers through contractors.

The first person in the marketing channel is the fish farmer, fish producer and last is consumer. Lesser the gap between the two, more profit will be achieved by both.

Some fish distribution channels are

Zero level

In this channel, fish collected by contractors from its production site is brought to market and sold.

One level

In this channel, fish collected by Retailers from its production site is brought to market and sold.

Two level

In this channel, fish collected by wholesaler / agent from its production site is brought and sold to retailer. It is long route than level one.

Third level

In this channel, fish collected by agent from its production site and is sold to wholesaler and wholesaler transfers to retailer. Finally retailer sells to consumer.

1.2.3 GOOD HYGIENE AT DIFFERENT STAGES OF MARKETING

Hygiene is to be considered as the priority need from the time of collection to the consumer level. It can be categorized as follows:

) **Working surface:**

Should be washed down and brushed thoroughly everyday using water and disinfectant.

) **Personal cleanliness:**

Hands should be kept clean and washed scrubbed frequently. Hand gloves should be used. People with cut and damaged hand should not handle fish protective clothing should be kept clean.

) **Equipment and Tools:**

Used bucket should be kept clean and off the floor.

) **Storage:**

Fish should be kept off the floor and should be kept in boxes with ice if possible.

) **Boxes:**

Should be clean and free rough surface. They should be thoroughly cleaned, disinfected and rinsed before use.

) **Building:**

Preferably, fish should be handled in covered area with proper flooring that can be easily cleaned. Screens on doors will help to keep out insects.

1.3 OBJECTIVES

1.3.1 General objective

The general objective of study is to analyze present fish marketing system in Rupandehi district and to find demand of fish in consumer market.

1.3.2 Specific objective

1. To study fish distribution channel
2. To know about fish production in Rupandehi district.
3. To know about the rate of major fishes, which have good market value in Rupandehi district.
4. To know about socio-economic status of fisherman in Rupandehi district.

1.4 JUSTIFICATION

1. Only few works have been done in the district till date. Thus extensive exploration of fish marketing covering this area i.e. Rupandehi district is essential.
2. Always city is given priority for the study of fish marketing system and small district like Rupandehi is neglected.
3. The fish marketing system will be studied for strengthening its marketing system.

1.5 LIMITATION OF THE STUDY

Since, social researches being a vague subject, so some kind of limitation is there, in every field of experimentation. Research was done in short time with limited resources and budget of a student (self financed). The research is based on primary data along with secondary data as well.

2. LITERATURE REVIEW

Several Nepalese workers have worked regarding fish marketing management and observations have been done so far. Hamilton (1822) was first who gave authentic information about the fishes of Nepal in his monumental work “Fishes of Ganges”. McClelland (1839) studied Indian Cyprinidae and Asiatic fishes. Gunther (1861) had worked on cold blooded vertebrata collected by Hodgson in Nepal. Day (1889) studied the fauna of British including Ceylon and Burma-fishes today and tomorrow. Regan (1907) studied and collection of Batrachia, Reptiles and seven fish species sent to him by Annadelei, India, out of which five species were reported from Nepal. Hora (1937) studied comparison of the fish fauna of northern and southern faces of the great Himalayan region. Hora (1940) studied ecology, bionomics and evolution of the torrential fish fauna. Menon (1949) have worked on fishes from the Koshi-himalayan region of Nepal. Ferrow (1978) described some limnological and biological data from the Rara Lake, which is deep lake in Nepal. Ferrow and Badgami (1980) gave a list of 120 species in his book “Wild Life of Nepal”. They also worked on biology of the commercially important species of fish of the Pokhara valley. Rajbanshi (1982) described general bibliography of fish and fishes of Nepal. Edds (1985) compiled a list of eight new records of fish previously not recorded from Nepal. Some studies on different aspect fish market, different types of fishes sold village markets and Kathmandu markets has been described by Shrestha (1994) in ‘ fishes fishing implements and methods of Nepal’. Smith, Bhandari and Sapkota (1996) studied aquatic biodiversity in the Karnali and Narayani river basins of Nepal.

Panth and Gubhaju (1997) studied on fish market management technique and post harvesting management technique in Nepal. Swar, Pradhan and Lofvall (1997) have mentioned role of fisheries and aquaculture in the economic development of Rural Nepal in NEFIS.

Lofvall (1998) had worked on marketing in Kathmandu valley in support to a new kalimati market project. Murray (1998) study reveals poverty allevation focused on rural aquaculture or fisheries development typically stress the potential of increased fish production to both sustain and enhance food security and for income generation. NIAM (1998) submitted the document that explains the present market study aims at stimulating

market driven intensification & diversification production to pave way to seek better quality of life for farmers and consumers of the state.

Studies were also made on fresh fish marketing in Kathmandu valley (Dahal 1998). Semi structured interviews were conducted with individuals and organizations and a day worksop on fish trading in Kathmandu valley was organized. Status of fish species in Nepal enumerated 185 indigenous fish found in Nepal have been described by (Shrestha 1998). Panth (1998) studied the fish preservation and its marketing.

Joshi and Tiwari (1999) studied the present fish marketing system and potentially for improvement. Khanna (2000) described fish preservation and processing. Strategies for the conservation of fish in Nepal was described by (Gubhaju 2001). Rajbanshi (2001) studied zoogeographical distribution and status of cold water fishes of Nepal. Gurung and Bista (2003) described indigenous fishes and their contribution in rural livelihoods in Nepal. Kleih (2003) submitted a guide to the analysis of fish marketing system using a combination of sub- sector Analysis and the sustainable livelihoods Approach.

Studies were also made on fish production and marketing system in Dhanusha district of Nepal (Sha 2005). Bhusal (2006) described the assessment of fish diversity and catch of Narayani River and its impact on household earning of fishermen. Dey and Prein (2006) studied on improving fish marketing system in selected terai district of Nepal. Shukla (2007) described food value of preserved fish culture. Rijal (2007) studies the fish marketing systems in Nepal and food and ornamental fishes of Kathmandu. The study report showed that the market of captured and cultivated fish is growing in the country annually.

Rai, Clausen and Funge-Smith (2008) conducted the study of FAO Regional office for Asia & the Pacific was requested to conduct a review of the development potential for fisheries and aquaculture in Nepal. Shrivastava (2008) studied on fish and fishery resources in Dhanusha district. The survey was done in Kamala, Jallad, Rato River and Bishara pond. Tiwari (2009) studied quality and marketing of fresh fish in Kathmandu valley of Nepal. Fish marketing and its management have been described by (Dhami and Dhami 2009). Chalise (2009) described the assessment of fish diversity and catch of Indrawati river and its impact on livelihoods of fisherman.

Yasmin et al. (2010) have worked fish marketing system in Swarighat, Dhaka, Bangladesh. Shilpi (2010) studied on fish and fishery resources of Dhanusha district.

Flowara et al. (2012) studied the fish marketing system and socio-economic status of Aratdars in Natore and Rajshahi, Bangladesh. Gandha (2012) and Jha (2013) have described fish marketing system in Dhanusha and Janakpur respectively. According to them fish marketing system in Dhanusha district is in improving way. Though study has been made in other districts of Nepal but study in Rupandehi district is still not reported.

3. MATERIALS AND METHODS

3.1 STUDY AREA

The study was carried out in the Rupandehi district. It is surrounded by Palpa in north, Nawalparasi in east separated by Mahab river and Kapilvastu in west separated by kothi river and south in India.



Fig: 1 Map of Nepal showing the location of Rupandehi district.

The climate of the Rupandehi district is marked by tropical and subtropical. There is a heavy rainfall during rainy seasons and heavy cold in winter seasons. The mean temperature was 42.4°c (max) and 8.75°c (min), rainfall was 1391 mm. annually (DADO Rupandehi, 2070).

3.2 STUDY PERIOD

The research work was conducted in the study area from April 2013 November 2013, during which the field was visited.

3.3 METHODS OF DATA COLLECTION

Field surveys were used for the collection of primary data. For the confirmation of the secondary data, primary data was used also. The study area was visited officially to check on standards in term of fish distribution and marketing information. By using questionnaire interviews and direct observations, primary data were gathered for this survey. The fishes of this area were identified by using different keys and photographs.

52 fish traders and 115 fish farmers were carefully choose as the most suitable in the study area through careful inspection for the questionnaire interviews. Questionnaire was examined in the field before interviews. At the market and fish production site traders and fish farmers were interviewed through a formal conversation for this purpose. Information about fish marketing channels, price of fishes, trading actions, constrains of fish marketing and socio-economic conditions of traders and fish farmers are the consequences of the interviews.

From appropriate government and non-government organizations such as Department of Fisheries Development (DOFD), different reports, research papers and dissertation secondary data about fish distribution and marketing information were gathered.

3.4 DATA PROCESSING AND ANALYSIS

Using Microsoft Excel software, data from different relevant sources were coded and recorded into a database system. To make certain the accuracy of the data recorded at each stage of the survey, similarity between preparatory data sheets and the original coding sheets were assessed, accuracy and quality of the data were examined up, edited and coded at the field level.

4. RESULTS

4.1 FISH MARKETS

Two types of fish markets are seen in Rupandehi district, namely:

1. Temporary hatbazar

This market is seen in particular (fixed) days. In this hatbazar the retailers and farmers sell fresh fish, vegetables, foods, fruits, meat. There is a opportunity of direct contact with producer and consumer.

2. Permanent hatbazar

This hatbazar is seen in everyday throughout the year. There are two permanent hatbazar in Rupandehi district namely, Kanchhi bazaar and Kalimai bazar which lies in the side of Kalimai temple in Bhairahawa.

Number of agriculture service centre is working to encourage and establish the fish farming and fish marketing in Rupandehi district (appendix I).

Fish markets are located at different places in Rupandehi district. There are 91 local hatbazar in different places of the district (appendix II). In Rupandehi district there are no wholesale fish market and fish collection centre. Fish markets are along with vegetable market. Among which name of some famous fish markets are, **Butwal hatbazar**, **Yogikuti hatbazar** and **Deepnagar (puspanagar)** in Butwal Municipality and **Pithiya hatbazar** in Siddharthanagar Municipality and **Padariya** in Lumbini.

Nowadays the new concept is developed for **live fish trade centre** (fish market). In Rupandehi district **three live fish trade centre** are opened, one in Bhairahawa and two are in Butwal. The aim of these markets is to provide fresh and live fishes to consumer and also they have started to supply in Restaurants (Hotels) to give extra facilities.

4.2 FISHES OF RUPANDEHI DISTRICT

List of fishes with their local names of Rupandehi district

Scientific name	Local name
1. <i>Amblypharyngodon mola</i>	Mada, Dhawi
2. <i>Aristichthys nobilis</i>	Bighead
3. <i>Barilius vagra</i>	Faketa
4. <i>Botia lohachata chaudhuri</i>	Baghi
5. <i>Catla catla</i>	Bhakura
6. <i>Chanda nama</i>	Chanari
7. <i>Channa gachuwa</i>	Chenga
8. <i>Channa punctatus</i>	Garai
9. <i>Channa striatus</i>	Saura
10. <i>Cirrhinus mirgala</i>	Naini
11. <i>Clarias batrachus</i>	Magur
12. <i>Colisa fasciatus</i>	Kotra
13. <i>Ctenopharyngodon idella</i>	Grass carp
14. <i>Cyprinus carpio</i>	Common carp
15. <i>Esomus danricus</i>	Dedhwa
16. <i>Gadusia chapra</i>	Suia
17. <i>Heteropneuste fossilis</i>	Singhi
18. <i>Hypophthalmichthys molitrix</i>	Silver carp
19. <i>Labeo rohita</i>	Rohu
20. <i>Macroganthus armatus</i>	Gaichi
21. <i>Mystus bleskeri</i>	Tengra
22. <i>Mystus seenghala</i>	Kati
23. <i>Oreochromis mossambicus</i>	Tilapia
24. <i>Oxygaster bacaila</i>	Chelhwa
25. <i>Puntius sophore</i>	Pothi
26. <i>Wallago attu</i>	Buhari
27. <i>Xenentodon cancila</i>	Chuchhe bam

4.3 FISHING IN RUPANDEHI DISTRICT

Generally in this district, fishing is done by the use of number of implements as net (cast net, gill net), ghorlang, bamboo implements (basket cage, ganj), rod and line, spears and sticks and use of poison, electricity.

4.4 FACILITIES

4.4.1 ROAD FACILITIES

Road facilities are not good in Rupandehi district, but there are continuously improved (appendix III). Gravelled road and coal tarred road are also seen. Road have been damaged at several places during the flood time.

4.4.2 TRANSPORT FACILITIES

Different mode of Transportation are used for distribution of fish and fishery products, bicycle are the most popular vehicles used for carrying the fishes, also they are transported by motorcycle, public passenger transport, rickshaw, bus and jeep.

4.4.3 UTENSILS USED IN FISH TRANSPORT

Fishermen use aluminum utensil (locally known as handies) and plastic boxes are mostly used for taking the fish to the market. They cover these vessels with clothes or plastic and tie it with the rope.

4.4.4 PRESERVATION FACILITIES

Mostly fresh fishes are sold in fish markets and remaining fishes are preserved in ice for next day in both types of hatbazar. The usual fish preservation is by smoking or sun drying. There is no fish processing factory and fish cold storage yet in Nepal. Ice factories are only in town and they do not produce enough to satisfy the demand for ice.

4.5 SELLING METHOD

Marketing channel (fish distribution) is more important for selling method. It is depending upon the kind and quality of fish market, ability to use marketing services and the prevailing social and physical environment. In this district the most common fish marketing channel that was generally observed was zero level 40% and one level 60%.

Fisherman catches the fish from rivers and ponds and sells them in market. Fishmongers use to sell fish placing it on plastic sheets on ground there are not proper shops to sell fish. Fishmongers sit on the mudha or bench and they keep their fishes on plastic which they called tripal. Knife (hasuwa) is used for chopping the fish and balance for measuring weight of the fish. Fishes that are brought to the fish market by contractor or fishermen are sold to wholesalers. The wholesalers sell fish to the local fishmongers or export it to other part of the country.

4.6 FISH PRODUCTION

In Nepal fish farming is mainly done in terai region. Out of total fish production in Nepal, terai region covers 97% (Fish export import survey profile 2066/2067 BS).

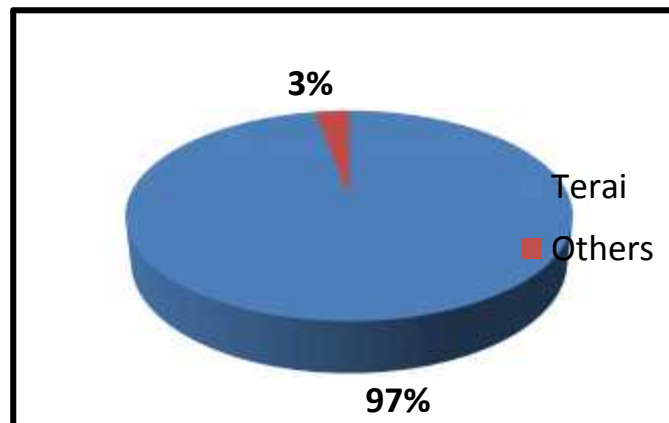


Fig: 2 Domestic fish production

4.6.1 ANNUAL FISH PRODUCTION

In Nepal the annual fish production has shows increment. Data shows in 2003/2004 fish production was 39, 947 MT, in 2010/2011 was 52, 450 MT and in 2012/2013 production was 57, 500 MT the increment was only 2.67% (approx).

Table No. 1

Annual fish production in Nepal

Year	MT
2003/2004	39,947
2009/2010	49,730
2010/2011	52,450
2011/2012	56,000
2012/2013	57,500

MT= Metric Ton (Source: DOFD, Department of fisheries development)

Annual fish production in Rupandehi district

Annual fish production in Rupandehi district during 10 years has shown 3 times increment. Data shows 2059/2060 fish production was 1160 MT whereas in 2069/2070 production was 3510 MT, which is shown in (appendix IV).

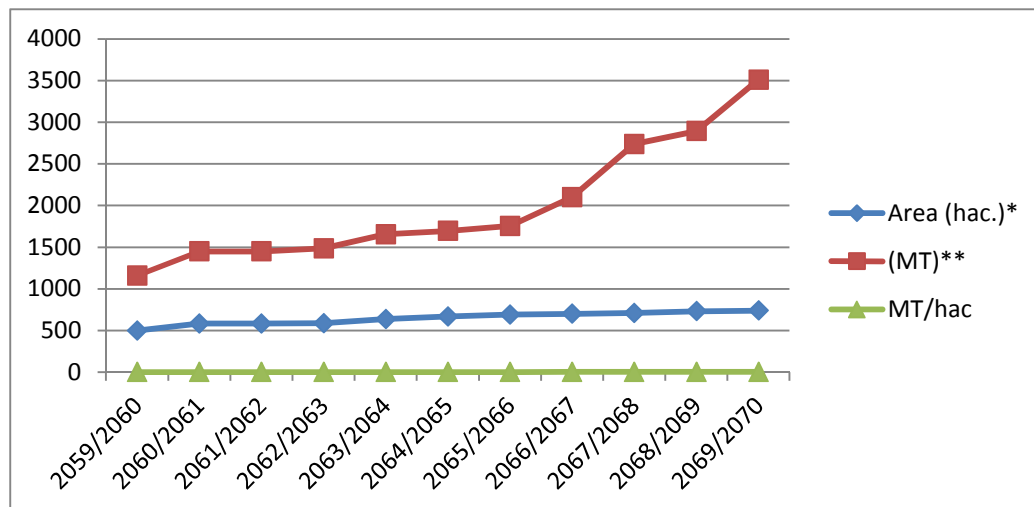


Fig: 3 Annual fish production in Rupandehi district. (Source: DADO, Rupandehi, 2069/2070)

Table No. 2

Production of hatchling, fry and fingerlings from Fishery Development Centre

S.N.	Types	Number (piece)	
		In Figures	In Words
1	Hatchling	2,58,00,000	Two crores fifty eight lakh only
2	Fry	30,01,700	Thirty lakh one thousand seven hundred only
3	Fingerlings	11,32,000	Eleven lakh thirty two thousand only

(Source: FDATC 2069/2070)

4.7 EXPORT AND IMPORT OF FISHES

In Rupandehi district there is only one government hatchery and approximately four active hatcheries (appendix V). Among the total fries produced, 49% of the productions of fries are exported to India and rest 51% is supplied in the district as well as other part of the country (Annual Program and Statistical Information DADO, Rupandehi district, 2069/2070).

The total fish imported from India to Bhairahawa is 3351.7 metric ton and the total fish exported to India from Bhairahawa is negligible (Animal Quarantine office, Bhairahawa 2069/2070).

Import of fishery products (2069/70)-fish seeds in pcs-14564100, fish-9963.06 MT, dried fish-514.642 MT and aquarium fish 104548 kg is reported in Nepal (Central Animal Quarantine Office, 2069/2070).

Table No. 3

Import of fishery products in Nepal

S.N.	Types	Pieces/MT/KG
1	Fish seeds (pieces)	14564100
2	Fish (MT)	9963.06
3	Dried fish (MT)	514.642
4	Aquarium fish (KG)	104548

(Source: Central Animal Quarantine Office, 2069/2070)

Import of Fishes of Fiscal year (2069/2070) in Bhairahawa

Maximum import of fishes from Bhairahawa in 2069/2070 has shown in Baisakh, Chaitra and Jestha respectively. Whereas minimum import in Shrawn, Bhadra and Falgun otherwise approximately imported in similar ratio which is shown in (appendix VI).

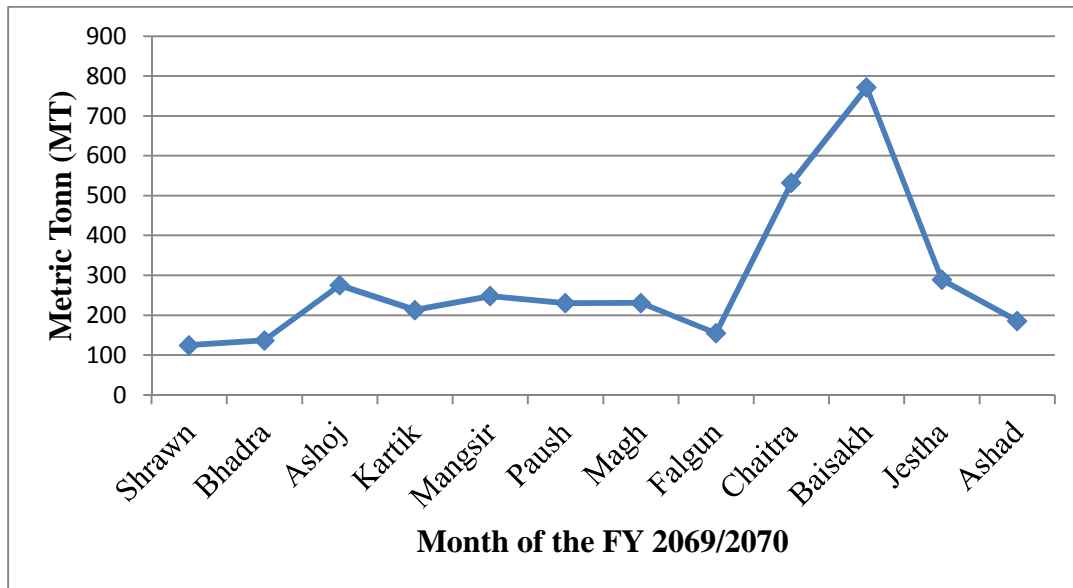


Fig: 4 Import of fishes in Bhairahawa (Source: Animal Quarantine Office Bhairahawa 2069/2070)

Table No. 4

Timetable for availability of fish seeds at Fishery Development and Training centre

S.N.	Type of fish	Types of fish seed		
		Hatchling	Fry	Fingerlings
1.	Common carp	-	Chaitra - Jestha	Ashad - Bhadra
2.	Silver carp	Baisakh - Bhadra	Jestha - Ashwin	Ashad - Mangsir
3.	Bighead	Baisakh - Sharawn	Jestha - Bhadra	Ashad - Mangsir
4.	Rohu	Ashad - shrawn	Shrawn - Ashwin	Ashwin - Magh
5.	Naini	Ashad - Bhadra	Shrawn - Ashwin	Kartik - Magh
6.	Grass carp	Last week of Chaitra to Baisakh	Jestha - Ashad	Shrawn - Bhadra

(Source: FDATC, 2070)

4.8 COST PRICE OF FISHES

Rate of hatchling, fry and fingerlings at Fishery development centre is

Table No. 5

Rate of hatchlings

S.N.	Type of hatchling	Rs./lakh piece
1.	Rohu, Naini,	2000/-
2.	Silver, Bighead, Grass carp & Bhakura	2500/-

Table No. 6

Rate of fry

S.N	Type of fry	Rs/1000 piece
1	All type	250/-

Table No. 7

Rate of fingerlings

S.N.	Size	Type of fingerlings	Rate in 2070 B.S.
1.	Below 2-3 inch	All type	75 paisa/piece
2.	Below 3-4 inch	All type	1.50 paisa/piece
3.	Below 3-4 inch	Silver, Bighead, Tilapia, grass carp	120/kg
4.	Below 3-4 inch	Common carp	150/kg
5.	Below 3-4 inch	Rohu, Naini, Bhakur	150/100 piece

(Source: FDATC, 2070)

Fishes like Rohu, Naini, Common carp, Bighead and silver are extensive at production site than other fishes.

Table No. 8

Rate of fishes at production site

S.N.	Type of fish	Rs/kg
1.	Rohu	200/-
2.	Naini	200/-
3.	Common carp	200/-
4.	Bighead	150/-
5.	silver	150/-

(Source: FDTAC, 2070)

Some fishes have high rate in the markets than other. They are Rohu, Naini, Bighead, Tengra, Grass and Buhari.

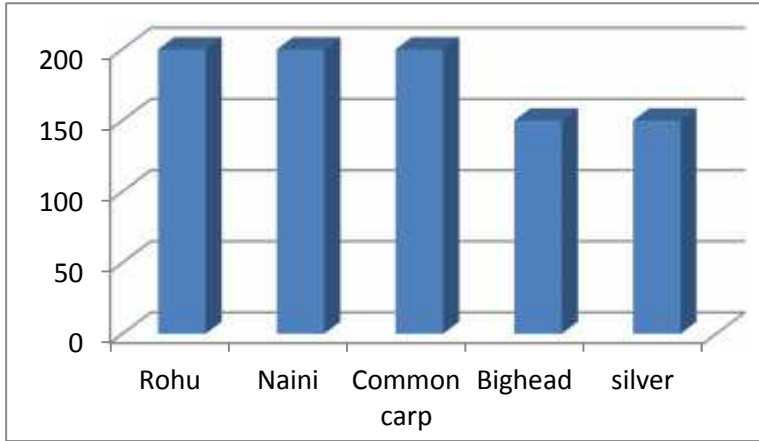


Fig: 5 Rate of fishes at production site

Rate of fishes in fish market 2070.

Rate of the fishes varied in fish market of this district but tentatively maximum rate of fishes namely Common, Bhakura, Magur and Singhi etc. Minimum rate of fishes are namely Pothi, Garai, Tilapia, Tengra etc. and average rate of fishes are Rohu, Naini, Bighead, Silver respectively which is shown in (appendix VII).

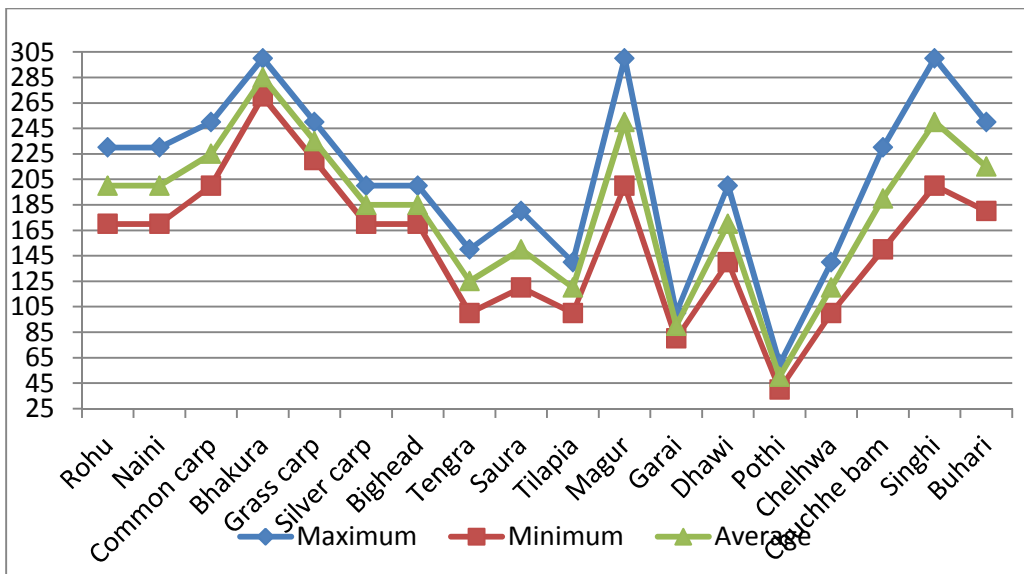


Fig: 6 Rate of fishes in fish market, 2070

4.8.1 ROHU FISH

Rate of Rohu

Year	Max Rs/Kg	Min Rs/Kg	Average Rs/Kg
2068	180/-	100/-	130/-
2069	200/-	100/-	150/-
2070	230/-	170/-	200/-

4.8.2 COMMON CARP

Rate of common carp

Year	Max Rs/Kg	Min Rs/Kg	Average Rs/Kg
2068	180/-	100/-	140/-
2069	200/-	100/-	150/-
2070	250/-	200/-	225/-

4.8.3 SILVER CARP

Rate of silver carp

Year	Max Rs/Kg	Min Rs/Kg	Average Rs/Kg
2068	150/-	80/-	115/-
2069	180/-	100/-	140/-
2070	200/-	170/-	185/-

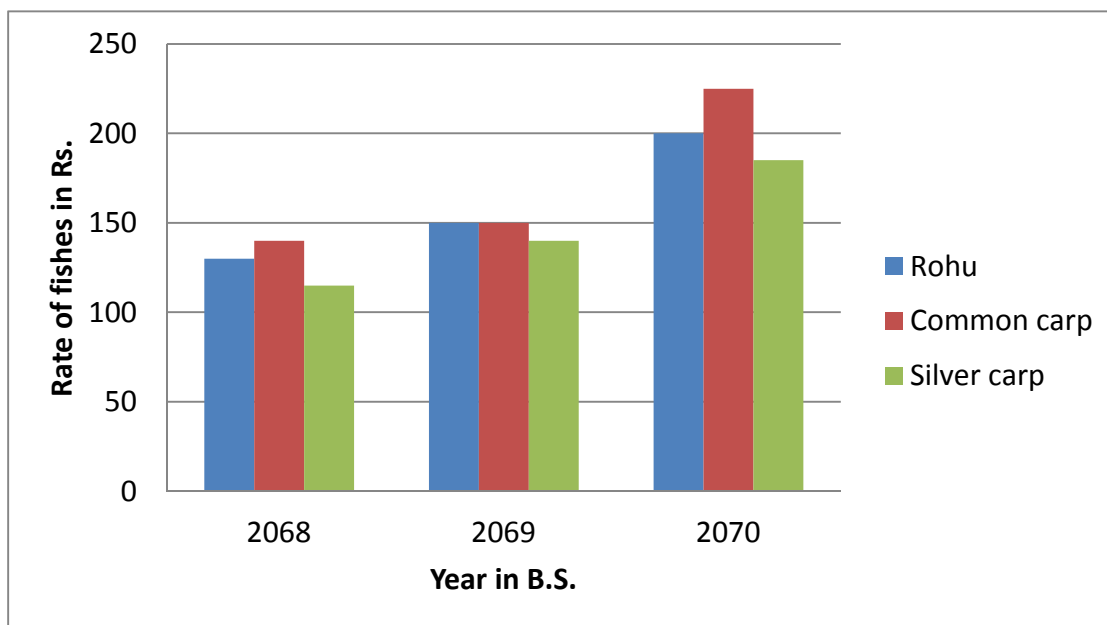


Fig: 7 Rate of Rohu, Common carp and Silver carp

Data shows the increment in the Rohu fish rate by 53.84%, Common carp fish rate by 60.71% and Silver carp fish rate 60.86% within last three years.

4.9 FISH INSURANCE AND LEGISLATION

According to insurance law 2069, section 8 (Gha-2) which was effective from Magh 1, 2069 the insurance committee has directed the structure and system of fish insurance. According to the provision in law Government of Nepal will invest 50% of insurance amount.

Conservation of aquatic life is addressed by the Aquatic Animal Protection act (AAPA) 2017 (1961), which prohibits the use of explosive or poisonous substances in anybody of water the intension is to catch or kill aquatic life. This act has been revised by the parliament and consolidated in 1999A.D.

Because of fish insurance and legislation the peoples are more attraction towards the fisheries sector of this area and it makes developing rules and regulations.

4.10 ROLE OF FISHERWOMEN IN FISH MARKETING

Nowadays the female members of the fisherman family are more involved in fish marketing business. They are handling their family business properly. They take their fish to market and sell them. They help in fish preservation, packing, smoking, and drying. Women play a key role of poverty alleviation from fisheries sector. The upcoming of women into the labour driven segments of fishing sector has increased over the 5 years. The pattern of occupation of women has further undergone structural change with the shift from net mending to fish marketing and processing.

The contribution of the fisherwomen penetrate every aspect of post – harvest, handling, preservation, processing and marketing of fishery products and provide an integral line between producers and consumers.

4.11 SOCIO-ECONOMIC CONDITION OF FISHERMEN OF RUPANDEHI DISTRICT

In Rupandehi district, the population of fishermen is about 1890 (DADO, 2068/2069). They belong to Turaha, Lonja, Tharu, Mallah, Chauhan, Goura, Muslim, Bihari, Magar, Chaudhary, Indian and Nepali etc. Generally, they live in those villages where there are rivers and large numbers of pond are found. In Rupandehi district the fishermen live mainly in Dayanagar, Suryapura, Parroha, Semlar, Motipur, Gangolia and Padsari.

The fishermen is illiterate, only few are educated upto class five, matriculated are rare. The educated are mostly male. The number of educated female is negligible.

Economically most of the fishermen are poor with simple lifestyle, but nowadays the male members of most of the fishermen family work in foreign country like, Malaysia, Dubai and Quarter etc. They sent money from foreign country to their family by different remittent and their family spent the money for different purposes.

Five years ago, fishermen used to earn money, which has just sufficient for feeding, but nowadays they spent not only for food but also for educating their children, health care, clothes, festivals etc.

Total family income of fishermen was found during study period is 15000. Among those income sharing the 7000 from fisheries sector which is shown in (appendixVIII).

Most of the houses of fishermen are made up of bamboo, straw. But nowadays they built their houses made by bricks. Their houses have 4 or 5 rooms. Average family members of fishermen are about 5 to 9.

The fishermen of male wear 'Dhoti' or 'Lungi' and 'Gangi' also wear 'Shirt' and 'Paint'. Whereas female wear 'Sari' and 'Blouse'. The food of fishermen is mostly rice, wheat, vegetables and fish.

4.12 FISH CONSUMPTION TREND

Food of fish is popularly increased in many households. The most interesting trend is the change in feeding habits of households, with many vegetarian and non vegetarian families, due to health ground. Many Brahmin approx 25% households consume fish which are strict vegetarian traditionally, due to the knowledge of nutrition, availability, taste and price about fish.

5. DISCUSSION

Rupandehi district mostly lies in terai region where the weather mostly remains hot throughout the year. The maximum temperature of this district recorded during 2070 was 42.4°C maximum and 8.75°C minimum.

The present work has been done in temporary, permanent and live fish markets in Butwal and Bhairahawa. The difference between the temporary and permanent fish markets were found that Supply, Rate and Quality of fish. The supply is higher in temporary fish markets rather than the permanent fish markets.

According to the fishermen the supply of fish in temporary fish market was maximum above 40kg recorded in the study period where as minimum till 12kg recorded in fish markets. In permanent fish market the supply is lower than that of temporary fish markets. Average 10-12 kg supply per day in these markets. It is affected by means of rate, quality and availability of market.

The rate of fishes in temporary fish market is lower than that of permanent fish market, because the permanent fish market lies in fixed where as temporary market is not fixed. The stock fishes are affected by means of transportation for next market in next places and may be changes the quality of freshness. Therefore, the fishermen sold their goods in cheaper prices. In permanent fish market the transportation is not affected by next bazar and as possible to keep for maximum freshness, Hence the rate of fishes are constant as much as possible.

The new fish market, live fish trade centre / live fish markets are totally different in rate, supply and quality of fishes. The live fish markets are new markets. There are immediately opened in all over the country. The aims of these markets are live fishes reaches to the kitchen table of consumer instead of dead and preserved fishes. The live fishes are very much difference from dead fishes in nutritive value, freshness, attractiveness, taste value and fear from microbial infection.

The difference of live fish markets and other fish markets were affected by means of rate, supply and quality. In live fish markets the rate of fishes are greater than that of other-

fish markets including extra charges like oxygen cylinder, water tank and use of skilled man power to reach in market. Live fishes are not easy to sell in market, it is not sold everywhere, the fish market is proper management with oxygenated water in building and management with suitable environment (hot & cold). The live fishes plays key role to remove the uses of formalin in fishes for preservation. According to the fisherman, supply of live fishes are lesser than that of dead fishes, i.e. in average supply approx 30kg in live fish market because the main problem is communication which is not developed / lack in the knowledge of live fishes trade and lower economic condition has also not encouraged the live fish trade. The formalin used Indian fishes are available in low cost prices in the fish markets.

Lofvall (1998) finding reveals that the condition for operating the market may be change over time and development should be monitored so that management can adjust accordingly. The present study “Status of Fish Marketing System in Rupandehi district” reveals that the operating system of the fish market can be enhanced by proper management and monitoring this sector regularly.

In the absence of organized fish marketing system and infrastructure, the fish farmers and its marketing system are affected as well, which is shown in the study of fish market study in the different countries. Murray, Koddithuwakku and Little (1998) have reported that the marketing system can improved by the proper coordination of producers, middleman, retailer and consumers. Flowara et al. (2012) studied the infrastructure of fish markets were not good but improving in regular pathway.

According to fishermen of Rupandehi district the fishes, which are not sold in markets, are preserved in ice for next day which causes 20-50 gm loss in fish weight. Preserved fishes show following problems:

-) If proper hygienic measures are not adopted during the process like cleaning, gutting, more harmed would be resulting to the preserved material owing to increase the microbial population.
-) Incomplete preservation leads to decarbo-oxylation of flesh amino acid i.e. histidine to histamine. The histamine and other related substances collectively named saurine are the common causes of fish poisoning (Srivastava 1999).

Sun dried fishes (locally known as sidra) are sold in very small scale in some fish markets like **Butwal hatbazar, Kanchhibazar, Yogikuti hatbazar.**

Most of fishes seen in the fish markets come from the local villages like Dayanagar, Suryapura and Padasari etc and rest is from India approximately 49% fishes are imported from the India in this district.

Old techniques are used for fishing in Rupandehi district. Similar study was done by Shrestha (1994) which referred to the fishes fishing implement and methods of Nepal. Especially in terai region fishing implements are used as gill net, cast net, rod and lines and basket implements.

The study shows that female members of fisherman are actively involved in fisheries sector like catching, selling, packing, preservation, smoking and drying. This helps in increasing the socio-economic conditions of the fishermen as well as demand of the fish and controlling the rate of fish, which in turn help in the uplifting the economic condition of the nation. The fisheries development policy of nation includes:

-) Empowering the traditional fishermen who are till now capable of fishing and increase production.
-) Promoting conservation and management aquatic resources and genetic diversity.
-) Increasing fish production through integrated approach to capture fishery and culture fishery.
-) Improved marketing network and promoting fishery industry with a view to generating more job opportunities for the people and improving socio-economic condition of traditional fishermen for improving rural economy.
-) Targeting an increase in per capita consumption.

Fisheries sector shows both strength and weakness in business. Following some strength and weakness of this sectors are:

Strength

-) Increase in knowledge about nutritional value of fish among people.
-) Increase the demand of fish in the market (growing consumer number).
-) Fish market insurance should be provided by the Government of Nepal
-) High price of goat meat.
-) Fear of bird flu.
-) Aquacultural development has followed an encouraging path in Nepal.
-) Building shops for fish markets.

Weakness

-) Transportation facilities not assured.
-) Lack of knowledge about hygiene maintenance in the fish market i.e. disposal of wastes.
-) Unstable government policies.
-) Big margin between the pieces of producers and traders.
-) Input of the Indian fishes in low cost reduces local fish demand.
-) There are no rules regulations of public ponds in tender processing.

The practice of poisoning the fish due to personal differences the major production of the fish is affected. Therefore, the major focus of the country is on the development of the marketing system for the fishes, which has been imported from the neighbouring countries. So it becomes the priority to check this problem and increase the local fish production with its proper marketing strategies.

6. CONCLUSION AND RECOMMENDATIONS

Fish marketing channel of Rupandehi district is very simple, which is increasing zero to one level. Contractors and Retailers combinedly worked in the collection of fish from the site of production in the fish hundi on bicycle, motorcycle and some time on buses to the fish market directly from where the fishes are sold and reaches to the hand of consumer.

There are 91 hat bazaars and 3 live fish trade centres in different location of the district. The lands of fish market are private. The fishes brought in the market are from local villages and India but in live trade centre fishes from only local villages not India. (DADO, 2070 Rupandehi district)

Fishermen contact with Contractors or Wholesalers, who sell them to local fishmongers or export to the other part of the country.

Altogether 27 species of fishes have been recorded from different markets of the district.

Fish production was 3510 MT from 739 hactors area in 2069/2070. (DADO, 2070 Rupandehi district)

Production of fish was 2.450 MT, hatchling was two crores fifty eight lakh, fry was thirty lakh one thousand seven hundred and fingerlings was eleven lakh thirty two thousand from Fishery Development and Training Centre in (2069/2070).

Import of the fish was 3351.7 MT from Bhairahawa in 2069/2070. (Animal Quarantine Office Bhairahawa)

The cost price of fishes varies from species to species and their consumption rate. The rate of almost fishes increases by 15-25% from production site while reaching to the hand of consumers.

The fishes which have high maeket value are Rohu, Naini, Magur, Grass carp, Common carp, Silver carp and Tilapia.

Socio-economic condition of fishermen of Rupandehi district is not very good but it is improving due to the increasing activities of fisheries sectors along with vegetable sectors. Women are actively involved in these sectors, improving on education, health in children and family background.

Fish feed, scarcity of fish seeds, pond poisoning, lack of technical knowledge, loan facilities are the problems in fish farming and lack of preservation facilities, transportation facilities and receive low prices of their product are the marketing problems in fishermen.

The nutritional value of the fish is high digestibility, biological and growth promoting for human consumption, so as food items its demand is high. However, the rate of production is not sufficient to fulfill the demand of consumers. Hence fishes imported from India to fulfill the demand and also consumers are not free from the formalin used fishes.

The main recommendations based on this study are as follow:

-) Government agencies, NGO, INGOS should play a supportive role in developing the fish marketing work.
-) Production initiation program and awareness program should be conducted in community level.
-) Transportation system, fish collection centre and permanent fish shop needs to develop on local area in order to reduce the cost and time, also it helps large amount of fish available in fish markets.
-) Increase the knowledge of chemical which neutralize the poison and to save the fish production from poisoning.
-) Management of water, hygiene, modern vehicles, stall and license problem of fishermen in fish markets.
-) Management of fish quarantine and fish market should be forced.
-) Training and technical support can be conducted to the targeted groups.
-) Producers should have right of involvement in marketing of fish markets (hatbazar) in Butwal and Bhairahawa.

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8. APPENDICES

Appendix- I: Agriculture service centre / VDC Fishery profile

S.N.	Agriculture service centre/VDC	No. of fishermen involved	No. of ponds	Covered area in hac.
1	Karahiya	205	385	42.63
2	Office area	218	402	46.66
3	Dhakdhai	145	235	29.86
4	Rayapur	55	83	13.2
5	Majhagawa	137	205	41.8
6	Vagawanpur	154	252	52.9
7	Suryapura	153	261	41.73
8	Parroha	65	159	31.8
9	Gajedi	29	51	6.5
10	Manpakadi	681	1209(Dayanagar 994)	150.22
11	Devadaha	26	32	3.3

(Source: DADO, Rupandehi district, 2068/2069)

Appendix- II: Name of hatbazars in Rupandehi district

S.N.	Day of market	Name of market	Total no of places
1	Sunday	Pithiya, Jigina, Ranibagiya, Gobdouri, Parsahawa, Valwari, Manigram, Rayapur, Karouta, Julianipur, Gobroul.	11
2	Monday	Padariya, Thumwa, Chhapiya, Semrahawa, Semara, Murgiya, Laxminagar, Masihawa, Madhauhiya, Puspanagar, Yogikuti, Hanumannagar, Kadamhawa, Bagouli, Gonaha.	15
3	Tuesday	Birtabazar, Bethari gonaha, Aahirouli, Jogada, Barbasa, Drivertol, Tikuligad, Farsatkar, Thutipipal, Saljhandi, Duimohan, Kadamhawa, Bethari, Harnampur.	14
4	Wednesday	Butwal, karuwani, Jamuhani, Aasurouna, Dhakdhai, Belrai, Suryapura, Majhagawa, Valwari, Valuhi, Bardahawa, Sukrouli.	12
5	Thursday	Pithiya, Barbasai, Bethuiya, Gajedi, Raneura, Manigram, Mahajidiya, Yogikuti, Puspanagar, Bishnupura.	10
6	Friday	Mainahiya, Khaireni, Dhakdhai, Semlar, Jhimjhimiya, Kamhariya, Parsahawa, Maryadpur, Drivertol, Karahiya, West Amuwa, Thutipipal, Kanchhibazar, Bagouli, Motipur.	15
7	Saturday	Butwal, Kotihawa, Jakistan, Haraiya, Mahilwar, Bansuri, Semari, Vairayi, Moglaha, Sahadouniya, Thakurapur, Surahawa, Asuraina, Roinihawa.	14
Total			91

(Source: DADO, Rupandehi, 2070)

Appendix- III:

A: Road facilities of Rupandehi district

S.N.	Type of Road	Length
1	Soil road	192.2 k.m.
2	Gravelled road	720 K.m.
3	Kalo patre	114.8 k.m.
4	Map passed road	66 k.m.
Total		1092 k.m.

B: The Road which joins district headquarter

S.N.	Name of Road	Type	Length
1	Siddhartha highway	Kalo patre	22.3 k.m.
2	Bhairahawa - Lumbini	Kalo patre	22 k.m.
3	Bhairahawa – Parasi hulaki road	Gravelled	16.5 k. m.
4	Hatibangai - Marchwar	Gravelled	25 k.m.

(Source: DADO, Rupandehi district, 2068/2069)

Appendix- IV: Annual fish production in Rupandehi district

Year	Area (hac.)[*]	(MT)^{**}	MT/hac
2059/2060	500	1160	2.3
2060/2061	583	1450	2.4
2061/2062	583	1450	2.4
2062/2063	587.5	1486.88	2.53
2063/2064	638	1655	2.59
2064/2065	667.52	1695.1	2.53
2065/2066	690.52	1755.57	2.63
2066/2067	700	2100	3
2067/2068	710	2737	3.8
2068/2069	732	2894	3.9
2069/2070	739	3510	4.74

(Source: DADO, Rupandehi, 2070)

* 1 hacter = 10,000 sq meters

** 1 metric ton = 1,000 kilogrammes

Production of fish was 2.450 MT (2069/2070) from Fishery Development and Training Centre, Bhairahawa.

Appendix- V: Private Hatchery Centres

S.N.	Name of Hatchery Centre	Address	Types of fish production
1.	Mandal Matsay Hatchery (Rameshwor Mandal)	Tikuligada-6, Pathar dada	Hatchling, Fry, Fingerlings
2.	Singh Matsay Hatchery (Ramsurat Singh)	Suryapura-9	Hatchling, Fry, Fingerlings
3.	Murau Matsay Hatchery (Dhurba Murau)	Surya-4, Lodhapurawa	Hatchling, Fry, Fingerlings
4.	Sukrouli fish farm (Om Parkash Chaudhary)	Kamhariya-5	Hatchling, Fry, Fingerlings

(Source: DADO, Rupandehi, 2069)

Appendix- VI: Import of fishes of Fiscal year (2069/2070) in Bhairahawa

Month	MT
Shrawn	124.71
Bhadra	136.67
Ashoj	275.28
Kartik	212.89
Mangsir	247.83
Paush	230.292
Magh	230.73
Falgun	155.06
Chaitra	532.2
Baisakh	771.18
Jestha	288.98
Ashad	185.88
Total	3351.7

(Source: Animal Quarantine Office Bhairahawa 2069/2070)

Appendix- VII: Rate of fishes in fish market 2070

S.N.	Name of fish	Price of fishes		
		Max Rs/Kg	Min Rs/kg	Average Rs/kg
1.	Rohu	230/-	170/-	200/-
2.	Naini	230/-	170/-	200/-
3.	Common carp	250/-	200/-	225/-
4.	Bhakur	300/-	270/-	285/-
5.	Grass carp	250/-	220/-	235/-
6.	Silver carp	200/-	170/-	185/-
7.	Bighead carp	200/-	170/-	185/-
8.	Tengra	150/-	100/-	125/-
9.	Saura	180/-	120/-	150/-
10.	Tilapia	140/-	100/-	120/-
11.	Magur	300/-	200/-	250/-
12.	Garai	100/-	80/-	90/-
13.	Dhawi	200/-	140/-	170/-
14.	Pothi	60/-	40/-	50/-
15.	Chelhwa	140/-	100/-	120/-
16.	Chuchhe bam	230/-	150/-	190/-
17.	Sighi	300/-	200/-	250/-
18.	Buhari	250/-	180/-	215/-

(Source: Local fish market of Butwal)

Appendix- VIII: Family income of the fishermen

S.N.	Source	Average income/per family/per month
1.	Catching of fish	2000/-
2.	Selling of fish	5000/-
3.	Agriculture	2500/-
4.	Labour	4000/-
5.	Cattle/poultry	1500/-
Total		15000/-

(Source: Fishermen of Dayanagar village)

9. QUESTIONNAIRE

A. Questionnaire for a fish production site survey

Questionnaire form no:- _____

Date:- _____

Interviewer's name:- _____

Site no:- _____

Respondent's Identification

1. Name:-.....
2. District:-..... Municipality / VDC:-.....
Ward No:-..... Village name:-.....
3. Sex: Male / Female
4. Ethnic group / Cast
5. Religion.....
6. Household size No. of Male No. of Female..... No. of children
7. Education :- Literate / Illiterate
8. Occupation:-.....
) Primary occupation:-.....
) Secondary occupation:-.....
9. What is your source of income?
10. Is there another source of income?
11. If yes, what is the source of other income?
12. Do you practice aquaculture in your area? Yes..... No.....
13. Which type of aquaculture in you practice? Which types, pond culture / polyculture / cage culture / raceways /or others warmwater or coldwater aquaculture.
14. What type of aquaculture – Intensive, semi intensive or extensive.
15. Which fishes you are interested? Local indigenous or exotic fishes.
16. Do you provide supplementary feeding or formulated feed to fish?
17. Do you or anyone in your family own land? YesNo
18. Who is the main person in your family to do fishing? Male / Female / Children

19. Division of work for fishing and fishing related activities.

Fishing and fishing related activities	Male	Female	Children

20. Do you and your family consume the fish you catch? Yes No.....

21. How much your family consumes fish in a month / Year?Kg.

22. Is there a market near your village? Yes No.....

23. If yes, how far is the market? Name of market (Hour / minute)

24. What type market is it?

Temporary

Permanent

Irregular (weekly / fortnightly / monthly)

25. How do you spend the income you earn from fishing?

a. Food %

b. Education %

c. Clothes %

d. House rent %

e. Save %

f. Others (specify) %

26. Are you a member of any group (fishers group etc) Yes No

27. If yes, what group?.....

28. Have you got any support service? Yes No.....

29. If yes, what support services did you get? (Multiple choice)

a. Fishing knowledge

b. Fishing equipments

c. Credit

d. Market and Market information

Supply

1. Which fish seed are mostly preferred?
2. How much supplied from this market?
3. In which season, the supply of fishes highest and lowest? Highest.....Lowest.....
4. Are all the harvested fish supplied to local market or somewhere else outside this district?

Cost operation

1. Will you tell me the price of various fish seed?
2. What is the cost of ice block?
3. What is the difference of price in fish farm local market and city market? Local market.....City market.....
4. Is there fluctuation in fish price depending upon different season or certain occasion (festival)? Yes.....No.....
5. Fish price increase trend is similar to meat price or fish price growth slower than meat during last five years. Yes.....No.....
6. If No, why? Fish demand is lower than meat or fish unpreferable food for local people.....

Role of hatbazar

1. What is the name of hatbazar?
2. What is the cost of hatbazar?
3. What is the difference between local bazar and hatbazar in fish marketing?
) Local bazar_____
-) Hatbazar_____
4. Fish marketing in hatbazar has been helped in alleviating poverty.
 a. Agree.....b. Disagree.....c. Indifferent.....
5. Fish marketing in hatbazar is greater or lesser than other area?
 a. Greater.....b. Lesser.....
6. If greater why?
7. Disired fish quantity is available in hatbazar. Yes.....or No....