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ANALYSIS OF SUPPLY CHAIN AND FISH MARKETING IN NAWALPARASI (EAST), NEPAL

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ABSTRACT

Study was conducted during October 2021 to November 2021, to investigate the supply chain, present market situation, marketing constrains, marketing margins, and the consumer's behavior and purchasing pattern towards the fish in Nawalparasi (East) district of Nepal. Fish producers, traders and consumers were surveyed through semi-structure questionnaire. Five fish Producers, eight wholesalers, twelve retailers and twenty consumers were randomly surveyed. Among 20 traders majority of the traders belonging to the Madhesi and Tharu community. Finding of the study revealed that fish trading almost dominated by male (84%). All the respondents involved in fish trading more than 30 years old. there was no specific marketing channel used by the farmers, 55.65% of total fish produce is sold to the wholesalers, 32.49% to the retailers and 11.86% is sold to the customers directly by the fish farmers. The marketing margin of Nepalese live fish Rohu and Common Carp was higher than other species of fish in the Nawalparasi (East). Nepali fish Rohu and common carp fetch highest price Rs 425/kg and Pangasius fetch lowest price Rs. 280/kg. Nepalese fish were mostly packed in plastic crates and transported by pick up van. Indian average fish sizes were 2.91 kg and Nepali average fish sizes were 1.91 kg. Among the major carp species; the most preferred one by the consumers was Rohu followed by Bhakur.

1. INTRODUCTION

Aquaculture is one of the fastest growing activity in the world that plays a significant role in the economy. The current total national fish production is 104,623 Mt of which 20 % is contributed by capture fisheries while 80% is from aquaculture (CFPCC, 2022). Fisheries sector contributes about 1.83% in Agricultural Gross Domestic Production and 0.44% in Gross Domestic Production (CFPCC, 2022).

The actual development of commercial fish farming and organized fish marketing in Nepal began with the implementation of Aquaculture Development Project under the support of Asian Development Bank (ADB) and United Nations Development Program (UNDP) after 1980 (Budhathoki and Sapkota, 2018). The value of fish as a supply of high quality protein has emphasized its important role in food security of the country. The fish marketing system of Nepal is self-regulating with increasing production and demand among the consumers. The growth of fish production as well as development of fishery sector in terms of economy and infrastructure is highly dependent on an efficient fish marketing system (Chourey *et al*., 2014).

Nawalparasi (East) is one of the leading fish farming districts of Nepal with increasing numbers of farmers involved in commercial fish farming. According to the data of 2021, there was total of 828 fish ponds with the production of 903 Mt annually (MoALD, 2021). Fish farm occupies 1123.17 hectares of land within the district. Nawalparasi has huge fish production potentiality with annual productivity of 4934 kg per hectare (MoALD, 2021). Despite the abundance of fisheries resources and relatively high consumption of fish in Nepal, the level of productivity seems far below the carrying capacity of the ponds (Koirala *et al*., 2021). The domestic output still falls short of demand. With the aim of import replacement and export promotion

government body had provided special programs for farmers but they are not being able to take proper advantage of it, however farmers are attracted towards fish farming day by day. Since domestic fish production alone is not sufficient to supply the fish demand of the country, significant amount of fish being imported from other countries (Ranjan, 2019). Due to open border, it is not possible to have record from government level. Along with this, lack of systematic fish market has also played a significant role in unavailability of exact export import data (Ranjan, 2019). Absence of cold storage facilities, insulated vehicles for holding the harvest and regulate supply are some of the fish marketing problems in Nepal causing spoilage loss during sales (Husen, 2019). This study is designed to find out the supply chain and marketing of fish in Nawalparasi (East) which help to identify the actual situation in fish production, supply and marketing system.

2. MATERIALS AND METHODS

2.1 Study Area

The study was carried out in the Danda and kawasoti bazar of kawasoti -16, Nawalparasi (East) district, Gandaki Province, Nepal. Nawalparasi (East) District is one of the high fish production district and the fish produced here are supplied most of the cities of the country.

2.2 Methods

Primary data were collected through interview with the help of semi-structural questionnaire. A set of questionnaires was prepared for the collection of primary data. The major variables included in questionnaires were trader's socio-demographic, gender role on trading business, source of fish, method of storage, packaging, and transportation, price of different species of fish, problem ranking, and volume of imported and exported fishes. The pretesting of the questionnaire was carried out with the traders at Kawasoti city and correction was done accordingly. Four places-connected with the road corridors- were selected purposively. Traders and Consumers were selected by using simple random sampling.

The field survey was conducted from October 2021 to November 2021. Commercial fish farmers, traders of kawasoti Municipality were considered the survey population and thus were included in sampling. Five fish Producers, eight wholesalers, twelve retailers and twenty consumers were randomly surveyed through semi structure questionnaire. The respondents were interviewed through visiting their homes and fish shop. The secondary information was collected by reviewing different publication from national level organizations such Central Fisheries Promotion and Conservation Center (CFPCC), literatures and journals.

2.3 Data processing and analysis

Data collected through respondents during survey was coded, compiled and entered in MS Excel. Statistical analysis of the mean for frequency, percentage, etc. was carried out using descriptive statistical tools and MS-Excel. As per the necessity; pictures, graphs, diagrams, narrative analysis, and other inferential statements was used that sufficiently extrapolate the prevailing status of marketing of fish, market constraints, market share of imported and domestic fish.

3. RESULTS AND DISCUSSION

3.1 Socio-economic characteristics of the respondents

Gender of respondents

From the study, it was found that most of the fish farmers were male (84.00%) and number of females was quite low. Female members helped in some of the activities like feeding, marketing but were not fully involved in fish farming.

Table 1. Gender of fish trader by trading category

Categories of trader	Gender		Total
	Male (%)	Female (%)	
Producer	4 (80.00)	1 (20.00)	5
Wholesaler	7 (87.5)	1 (12.5)	8
Retailer	10 (83.33)	2 (16.66)	12
Total	21 (84.00)	4 (16.00)	25 (100.00)

Figures in parentheses indicate percentage

Age of respondents

It was observed that almost all the traders involved in fish trading business were more than 30 years of age. The mean age of producer, wholesaler and retailer involved in trading business were 39 years, 34 years and 46 years respectively. Generally, the retailer was older than the wholesaler (Table 2).

Table 2. Age of respondents by trading category

Categories of trader	Age (Mean± SD)
Producer	39±9.61
Wholesaler	34.5±8.1
Retailer	46.8±13.43

3.2 Supply chain of marketing of fish

The findings suggest that there was no specific marketing channel used by the farmers. The farmers in the study area sell fish in daily or periodical local market. Most of the harvest was sold in local market (hatiya) and within the district to different wholesalers, retailers or directly to the consumers following different marketing channels. Certain amount of harvest is also sold to distant market like Chitwan, Butwal, and Kathmandu. 55.65% of total fish produce is sold to the wholesalers, 32.49% to the retailers and 11.86% is sold to the customers directly by the fish farmers. It was found that the farmers get good market on some days while some times it is hard to sell their produce. Unsystematic marketing channel is a serious problem. Similar result was found which stated that Market links and channels are not feasible to small and medium scale farmers which make them unable to sell their products (Shrestha, 2072).

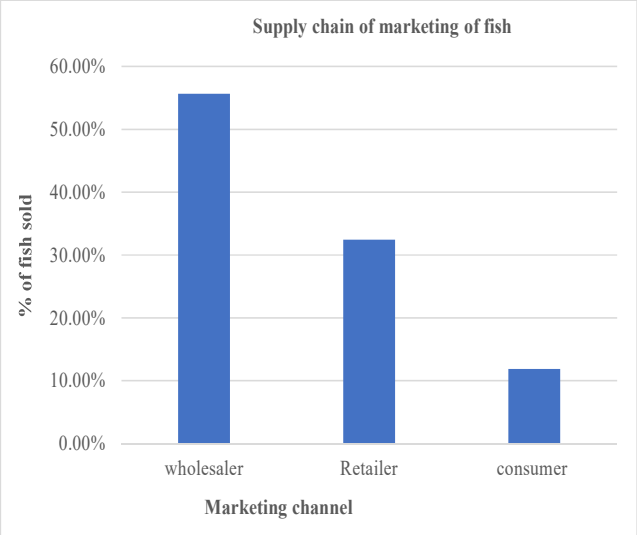

Figure 1. Supply chain of marketing of fish

3.3 Marketing margin of Nepalese fish

As shown in Table 3, the Rohu and common carp fish had greater marketing margins of Rs.125/kg. The marketing margin of Naini, Silver and Bighead had Rs.100/kg followed by Chhadi, Mangur and Pangasius Rs. 70/kg, Rs.50/kg, Rs.50/kg respectively. Pangasius and Magur had least marketing margin in Nawalparasi (East) district.. The cost of live fish was found relatively higher than the fresh fish

Table 3. Marketing margin of Nepali fish

Species of fish	Producer average price (Rs./kg)	Retailer average price (Rs./kg)	Marketing margin (Rs./kg)
Chadi	230	300	70
Rohu	300	425	125
Naini	250	350	100
Bighead	250	350	100
Silver	250	350	100
Common	300	425	125
Pangasius	250	300	50
Mangur	230	280	50

3.4 Market price of Nepali and Indian fish in Nawalparasi (East)

Fish is considered to be relatively cheaper food product compared to mutton and chicken. Price of fish may vary due to a variety of factors such as season, location of sale, size, and species of fish and inflow of fish from India (Koirala et.al., 2021). As shown in Table, study shows that Nepalese fish fetch higher price than Indian fish because fish bringing fish from India in ice packs taking long time, influence the quality of the product, which consumers not prefer Nepali fish Rohu and common carp fetch highest price Rs 425/kg and Pangasius fetch lowest price Rs. 280/kg.

Table 4. Market price of Nepali fish

Species of fish	Farmgate average price (Rs./ kg)	Wholesaler average price (Rs./ kg)	Retailer average price (Rs./ kg)
Nepali Fish			
Chadi	230	250	300
Rohu	300	355	425
Naini	250	278.89	350
Silver	250	281.11	350
Bighead	250	281.11	350
Common	300	367.78	425
Pangasius	250	280	300
Mangur	230	250	280
Indian Fish			
Rohu		310	380
Pangasius		240	280

3.5 Marketing size of Nepali and Indian fish

The fish imported from India were bigger in size and the average weight was 2.91 kg ranging from 0.48 kg to 5.34 kg whereas the fish produced in Nepal were smaller in size; the average weight was 1.91 kg ranging from 0.03 kg to 3.79 kg.

Table 5. Marketing sizes of Nepali and Indian fish

Parameter	Source of fish	
	Nepal	India
Max. size of fish (kg)	3.79	5.34
Min. size of fish (kg)	0.03	0.48
Mean size of fish (kg)	1.91	2.91

3.6 Fish transportation

As presented in the table below, most of the wholesaler (25%) used Motorcycle as a means of transportation, 62.5%% used pick up while 12.5%% used buses for the transportation of fish. On the other hand, retailer used pickup (41%) as a means of transportation followed by motorcycle & cycle (25%) and buses (8.33%) for the transportation of fish. In total, 50% traders used pick van as a means of transportation. Only 10% traders used buses as a means of transportation medium to transport the fish.

Table 6. Use of transportation means by traders

Categories of trader	Transportation Medium				Total
	Bus	Pickup	Motorcycle	Cycle	
Wholesaler	1(12.5)	5(62.5)	2(25.00)	0(0.00)	8
Retailer	1(8.33)	5(41.66)	3(25.00)	3(25.00)	12
Total	2(10.00)	10(50.00)	5(25.00)	3(15.00)	20

Figures in parentheses indicate percentage

3.7 Packaging container

It is evident that majority of traders (65%) use Styrofoam crates packed with crushed ice for packaging the fish and 25% use bamboo baskets and hundies for packaging the fish. Whereas, 10% of the traders transported live fish by providing aeration as consumers prefer live fish. Out of the total 20 traders, 13 used Styrofoam crates, 5 used bamboo baskets and hundies and 2 used aeration boxes for fish packaging.

Table 7. Use of packaging container by traders

Traders category	Modes of Packaging			
	Bamboo basket/ hundies	Styrofoam crates aeration boxes		Total
Wholesaler	1(12.5)	5(62.5)	2(25.00)	8
Retailer	4(33.33)	8(66.66)	0(00.00)	12
Total	5(25.00)	13(65.00)	2(10.00)	20

Figures in parentheses indicate percentage

3.8 Fish purchasing pattern

Purchasing time or pattern means how many times consumer buy the product. During the study period, consumer purchasing pattern was classified as once, twice, thrice and more than three times in a month. The figure shows that higher number of consumers purchase the fish twice in a month (75%). Only 7.50% of the total respondent purchased the fish thrice in a month and 17.50% of the total respondents purchased once in a month.

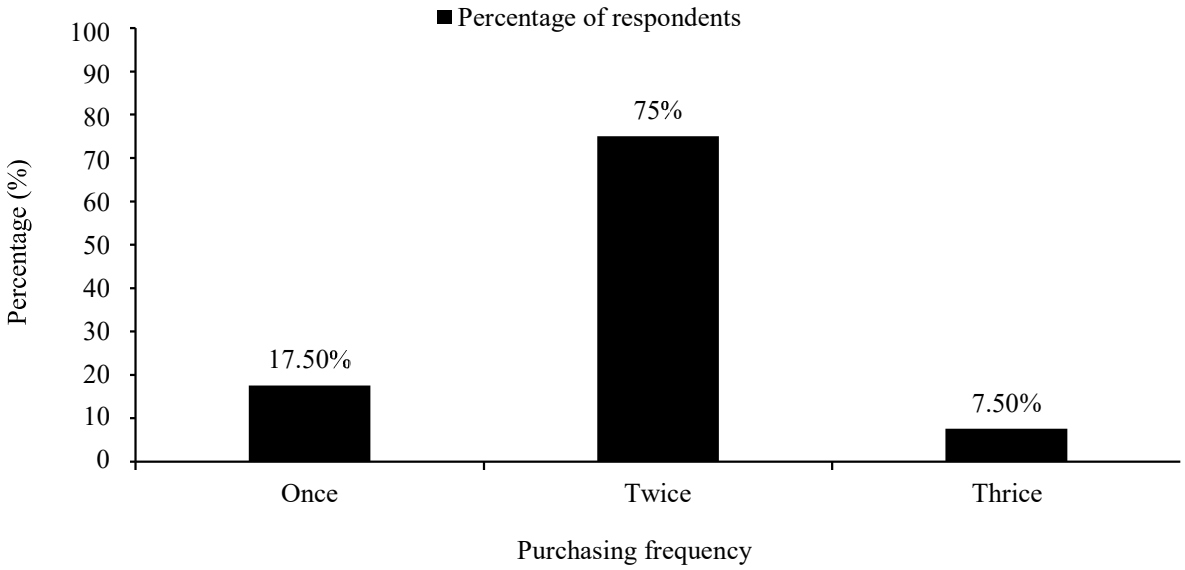

Figure 2. Consumer purchasing frequency (in a month)

3.9 Marketing situation

The Study shows most of the consumers (50%) said that the fish marketing of Nawalparasi (East) is considerable or average, 15% of the consumer said that marketing of fish is good and 35% of consumers said that the fish marketing need to be improved.

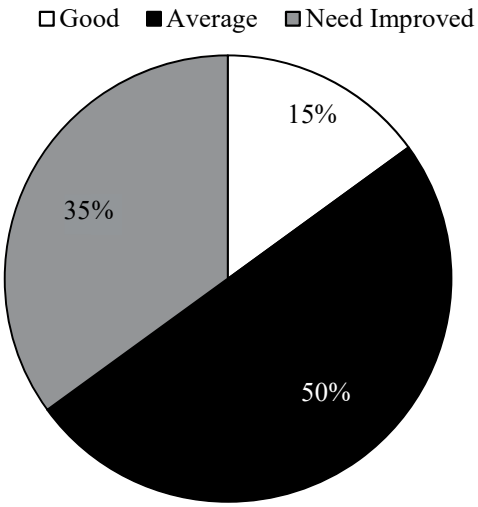

Figure 3. Consumer opinion towards marketing of fish

3.10 Consumer preferences on different fish species

Among the major carp species; the most preferred one by the consumers was Rohu followed by Bhakur similar result was found by Koiralaa et.,al. (2021) . It was due to the good taste of those fish species despite high price of Bhakur. Bighead carp and common carp were average preferred fish by the consumers within the district. Similarly, Chhadi fish of Naini was found to be preferred by consumers as it was produced in high quantity and was comparatively cheaper. Likewise Silver carp and Grass carp were found to be less preferred by the consumers.

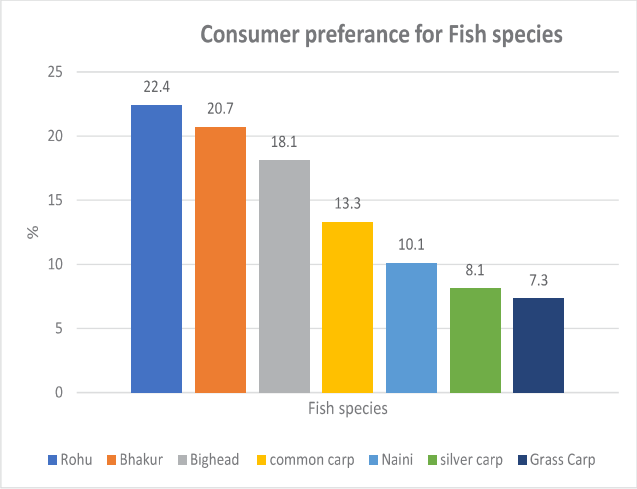

Figure 4. Consumer preferences on different fish species

4. CONCLUSION

From the study, it was found that most of the fish farmers were male, female members helped in some of the activities like feeding, marketing but were not fully involved in fish farming. The farmers in the study area

sell fish in daily or periodical local market. Most of the harvest was sold in local market (hatiya) and within the district to different wholesalers, retailers or directly to the consumers following different marketing channels. Rohu and common carp fish had greater marketing margins of Rs.125/kg. The fish imported from India were bigger in size and whereas the fish produced in Nepal were smaller in size. Nepalese fish fetch higher price than Indian fish. Due to open boarder conditions of district large number of fish are imported from India which can directly affected on Nepalese fish market. Local fish market management is the key factor for the enhancement of Nepalese fisheries sector. Fish farming along with fish marketing is one of the growing branch of agriculture in Danda and Kawasoti Bazar of Nawalparasi (East) district by providing employment oppurtunities to the households. With the proper management of fish preservation facilities, establishment of cold storage, cold vans for fish transportation, improvement of existing fish marketing chains ensure healthy fish marketing chain from producers to the consumers. Hygienic fish marketing supply provide nutritional and food security along with post-harvest loss and quality declination of fish. Strict rules and policies should be implemented to check the quality of fish import from the neighboring country India. Similarly, effective management system policies should be made in local government level for controlling overexploitation in riverine fisheries resources. The involved human resources in the fish farming and marketing channels should be well trained with fish preservation, fish handling techniques to elevate quality of marketing system in Nawalparasi(East) district.

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