RESEARCH ARTICLE

MARKETING TRADE AND POST-HARVEST LOSS OF FISH IN MORANG DISTRICT, NEPAL

Ananta Dhakal[a]*, Rakshya Aryal[a], Ashmita Dhakal[a], Gaurav Ranabhat[a], Narayan Raj Joshi[b]

[a]*Faculty of Agriculture, Agriculture and Forestry University, Rampur, Chitwan, Nepal*
[b]*Department of Agricultural Extension and Rural Sociology, Agriculture and Forestry University, Chitwan, Nepal*
*Corresponding author e-mail: anantadhakal123@gmail.com

ARTICLE DETAILS

ABSTRACT

This study was carried out in Morang district of Nepal. A list of all farmers involved in fish farming in the study areas was collected from PMAMP fish zone office Morang. Data were obtained by sampling 70 farmers; 25 from Rangeli municipality, 25 from Dhanpalthan and 20 from Katahari rural municipalities involved in commercial or semi-commercial fish farming. Also 15 consumers and 15 traders were taken by simple random sampling technique. Various analytical software's were utilized for the analysis of the data obtained. SPSS, MS-EXCEL, STATA was used to get the analyzed result. Long marketing channels are one of the reasons for increased marketing costs and bring inefficiency in marketing which results in the loss in the consumers' welfare and producers' share. In long marketing channel farmers get 45%-55% of the consumer price and the rest was absorbed by the traders present in the identified channels of marketing. Market channel signifies how the product is transfer in the market from the farmer level to consumer-level through different levels. Out of total respondents, 42.86% of respondents responded that the fish is sold to the commission agent/middleman followed by the wholesaler to retailer and finally to the consumer. A basic skill for minimizing the post-harvest loss of fish from spoilage was ice and refrigerator. There is a significant price variation between the price received by farmers with and without the middleman. The findings will be beneficial for planners, policymakers, project implementers, farmers and donors to formulate, policy, strategy and plan; it implies awareness among farmers from not being exploited in the market system.

KEYWORDS

1. INTRODUCTION

Aquaculture has played an important role in the livelihood of Nepalese people. The the Koshi, Gandaki, and Karnali are the three major river systems of Nepal. Nearly three percent of the total area of Nepal is occupied by water resources, of which about 500,000 hectares may be available for fish farming (Shrestha J. , 1999). Nepal is rich in fish biodiversity and about 200 species of fish are available, of which around 190 are indigenous species and remaining are exotic species. (Sharma, 2008). Fish farming in Nepal is considered as one of the ancient farming system, there are lots of small scale fish farms in different villages in the plain region started years ago. Commercial fish farming provides many profitable opportunities; farmers are raising and selling the fish on a commercial basis in Nepal.

Warm water fish species such as Rohu (*Labeo rohita*), Bhakur (*Catla catla*), and Naini (*Chirhina mrigala*) and Common carp (*Cyprinus carpio*) introduced in 1956 from India are main species cultured at commercial scale in Nepal. The herbivore Grass carp (*Ptenopharyngodon idella*) was introduced in 1966 from India, phytoplankton feeder the silver carp (*Hypophthalmicthys molitrix*) in 1968 from Japan and zooplankton feeder bighead carp (*Aristichthys nobilis*) in 1971 from Hungary for poly-culture. These seven carp fish species are the main species commonly used by the

farmers for commercial farming.

The term 'marketing' refers to the action or business of promoting and selling products or services. Marketing activities and strategies result in making products available that satisfy customers while making profits for the companies that offer those products.

Fish is an extremely perishable foodstuff and its marketing issues are of great concern to the government, farmers and consumers. Marketing is as critical to better performance in agriculture as fish farming itself (Jha, 1999.).Therefore, market reform ought to be an integral part of any policy for agriculture development (Acharya & Agrawal., 1999). Fish marketing is to bring the fish to the consumers before the quality is deteriorated. Marketing functions or services include many aspects such as collecting small quantities from many producers, grading, packing, transporting to distant city based wholesale markets and distributing to retailers. Fish marketing is the marketing, sale of fish and its products.

Post-harvest loss in fish refers to fish that is either discarded or sold at a relatively low price because of quality deterioration or owing to market dynamics. Fish operators such as fishers, processors, traders, and other stakeholders involved in ancillary operations may lose potential income. This also means that fewer fish are available to consumers or consumers are supplied with low-quality fish and fish products. This also creates

negative implications for food security. Post-harvest fish losses are caused by biochemical and microbiological spoilage changes that occur in fish after death. A live fish has natural defense mechanisms that help them to prevent spoilage. However, once a fish dies it's all defense mechanisms stop and enzymatic, oxidative and microbiological spoilage begins to cause quality deterioration. Several factors tend to influence the rate of spoilage of fresh fish: a) Time between death and final use or consumption b) Temperature abuse**:** High ambient temperatures c) Handling practices. Poor handling practices lead to increased microbial contamination, hastening the spoilage rate of fish.

2. ATERIALS AND METHODS

Research methodology is defined as the systematic, theoretical analysis of the procedures applied to a field of study (Kothari, 2004). Research methodology consists of the procedures used by the investigator to answer the questions expressed with logic. It encompasses the concepts such as research designs, target population, sample size and sampling procedure, data collection instruments, analysis of the data and their interpretation (Kothari & Garg, 2014).

2.1 Lee site and sub-sector

Morang district is a part of province no 1 in Terai plain located in the south-eastern part of the Koshi zone of Nepal. It shares 26º 20' N latitude and Longitude of 86º 16" E. The district has a tropical climate with hot summer and cold winter. It lies in the altitude ranging from 60 meters above sea level to 2410 meters above sea level. About 80% of the total land of the district is occupied by plain areas. Fish zone office in Morang under PMAMP is located in Haatkhola, Katahari which is about 3 km east from headquarter Biratnagar. The site of the study were Rangeli municipality, Dhanpaalthan and Katahari rural municipality all were situated in the south-eastern part of Morang district which is among the coverage area of PMAMP.

2.2 Sample and sampling technique

A list of all farmers involved in fish farming in the study areas was collected from the PMAMP fish zone office, Morang. Data were obtained by sampling 70 farmers; 25 from Rangeli municipality, 25 from Dhanpalthan and 20 from Katahari rural municipalities involved in commercial or semi-commercial fish farming. Also, 15 consumer and 15 traders were taken by simple random sampling technique to fill up the questionnaire. A Cluster sampling technique that includes a simple random sampling technique was used to collect the sample.

2.3 Research instruments and design

A Well-designed questionnaire was prepared and asked individually to each fish farmer, face to face in the field condition. Direct field observation was also be done to access the actual condition of the field.

2.3.1 Pre-testing of questionnaire

The questionnaire was pre-tested prior to field survey for checking the reliability and validity and then the necessary adjustment was be made as per the requirements after administering the questionnaire to the 5% farmers of the vicinity.

2.3.2 Field Survey

After the completion of pretesting, the study was conducted with the help of enumerators. A Field survey was conducted during April and May 2019. The pre-tested questionnaire (schedule) was hand out to the respondent to collect the primary data. The information regarding the present situation of fish production in the farmer's field and marketing channel was observed.

2.3.3 Focus Group Discussion (FGD)

One comprehensive Focus Group Discussion (FGD) was conducted at the study area after completing the field survey with the help of the checklist to verify the result obtained from field survey, to know various factors about the market channel for fish farming. In the FGD participants were local fish farmers, of all ethnic groups irrespective of the gender.

2.3.4 Key informant interview

Farmers were interviewed with the preparation of a checklist and their data were collected.

2.4 Data and Data types

The primary data was collected from the people of the site who have proper knowledge about the fish production and supply systems. Primary methods were used to collect data, share experience and knowledge. Primary data collection was conducted through focus group discussion, key informant survey and questionnaire.

Secondary data was obtained from DADO annual reports, newsletters, bulletins, relevant articles, from different libraries, various information offices: Department of Agriculture, Ministry of Agriculture and Cooperatives (MoAC), Ministry of Agriculture Development, Agriculture Service Centers (ASC), and Internet browser etc. Besides these, data from the Intergovernmental Panel on Climate Change (IPCC), Production area, production and productivity data of MoAC, FNCCI were also obtained.

2.5 Data analysis techniques

The obtained data was systematically arranged, entered and put forward for analysis. Various analytical software was utilized for the analysis of the data obtained. SPSS, MS-EXCEL, STATA was used to get the analyzed result.

2.6 Indexing

Indexing technique was done for problem, preference ranking based on value given by respondents. Problems faced by respondents on the adoption of improved production technology of fish were ranked with the use of the index. Scaling techniques, which provide the direction and extremity attitude of the respondent towards any proposition (Miah, 1993) was used to construct the index. The intensity of problems and measures were identified by using eight-point scaling technique using scores of 1.00, 0.875, 0.75, 0.625, 0.50, 0.375, 0.25 and 0.125. The formula given below is to find the index.

$I_{prob} = \Sigma\, S_iF_i/N$

Where,
I_{prob} = Index value for intensity
Σ = Summation
S_i = Scale value of ith intensity
F_i = Frequency of ith response
N = Total number of respondents

3. RESULTS AND DISCUSSION

3.1 Socioeconomic and demographic characterization of the Study area (2019)

3.1.1 Gender characteristics of the sample household

Concerning, the gender distribution of household head; it was found that 81.43 percent household was male-headed while remaining 18.57 percent was female-headed. Out of total sampled for trader (wholesaler and retailer) and consumer, it was found that 80 % of respondents were male and 20% of respondents were female in both.

Table 1: Gender distribution in the study area			
Categories	Gender		Total
	Male (%)	Female (%)	
Producer	57(81.43)	13(18.57)	70(100)
(Wholesaler & Retailer)	12(80)	3(20)	15(100)
Consumer	12(80)	3(20)	15(100)

Figures in the parenthesis indicate the percentage of the total Source: Field survey 2019

3.1.2 Distribution of economically active population by age

It was found that the average age of the household head was 45.27 years with deviation ±10.76. Also, it was found that the average age of traders (wholesalers and retailers) was 45 years with deviation ±8.203. Out of 15 respondents it was found that the mean age of consumers was 36.67 with deviation 12.51.

Table 2: Age distribution of respondent	
Categories of trader	Age (Mean ± SD)
Producer	(45.27 ± 10.76)
(Wholesaler & Retailer)	(45 ± 8.203)
Consumer	(36.67 ± 12.51095)

Figures in the parenthesis indicate the percentage of the total

3.1.3 Education level of sample population

The educational status of the producer was assessed on four categories namely, Illiterate, Literate, below S.L.C and S.L.C. The term illiterate referred to those who could not read and write. Literate referred to those who could read and write. Remaining two categories was based according to the formal education obtained by the individual.

Table 3: Educational level of respondent farmers

Category	Educational Level				Total
	Illiterate	Literate	Below S.L.C	Above S.L.C	
Producer	17(24.29	12(17.14)	20(28.57)	21(30.00)	

Figures in the parenthesis indicate the percentage of the total

3.1.4 Ethnic Composition

Out of 70 surveyed (21.43%) were from the Brahmin, (14.29%) Chhetri community followed by Madhesi (54.29%),) and Janajati (10%) respectively as shown in Table.
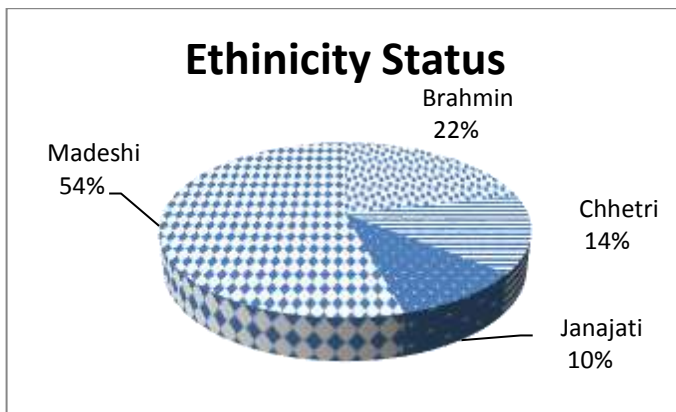

Figure 1: Ethnicity of respondent farmers of the study area

3.1.5 Major occupation of the respondents

Fish farming is also a source of part-time income for farmers. Most of the farmers are involved in agriculture along with fish farming while few farmers are also involved in trade and service. 84.29 % are involved in agriculture, 5.47% are involved in both Business and Service and 4.29 % are involved in other sectors such as industry, driving etc.

Table 4: Major occupation of the respondents

Occupation	Frequency
Agriculture	59(84.29)
Business	4(5.71)
Service	4(5.71)
Others	3(4.29)
Total	70(100)

Figures in the parenthesis indicate the percentage of the total

3.1.6 Landholding, ownership and pond area of respondent farmers

Among the farmers landholding ranges from 10 Katha to 260 Katha with a mean of 34.77± 56.10 SD. Pond area of farmer ranges from 6 Katha to 180 Katha with a mean of 20.80 ± 24.82 SD. The average number of ponds was 3.28 ±3.43 SD, ranging from 1 to 25.

Table 5: Total land holding, pond area and no. of ponds

Categories	Observation	(Mean ± SD)	Min	Max
Total land area (Katha)	70	34.77±36.10	10	260
Total pond area (Katha)	70	20.80 ±24.82	6	180
Number of pond	70	3.28 ±3.43	1	25

Most of the farmers use their own land for fish farming while few are doing contract farming and rented farming. 74.28% of respondent responded to hawing own land for fish farming, while other 11.44% and 14.28 responded for contract and rented farming respectively.
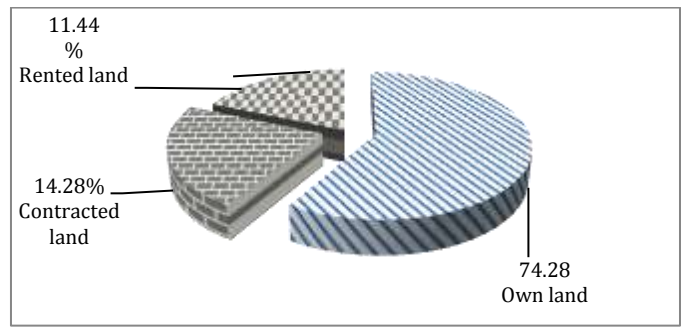

Figure 2: Ownership of land of farmers

3.1.7 Types of pond

Out of 70 respondents, 100% of farmers performed fish farming in earthen type's pond.

Table 6: Distribution of respondent based on types of pond

Types	Frequency
Earthen	70(100)
Cemented	00(00)
Total	70(100)

Figures in the parenthesis indicate the percentage of the total

3.1.8 Source and means of irrigation

It was found that 72.85% of respondents used pipe system as a means of irrigation and the remaining 27.14% responded for pipe followed by Kulo. And, 58.57% of farmers use deep boring, 25.71% river/irrigation canal and others (pond) 15.71 % as a source of irrigation.
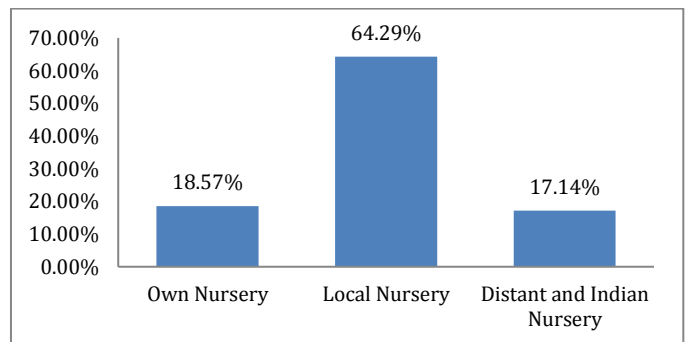
Table 7: Distribution of respondent based on source and means of irrigation

Source of irrigation	Means of irrigation		Total
	Pipe	Pipe followed by kulo	
Deep boring	39	2	41(58.57)
River/irrigation canal	5	13	18(25.71)
Pond and other sources	7	4	11(15.71)
Total	51(72.85)	19(27.14)	70

Figures in the parenthesis indicate the percentage of the total

3.2 Marketing scenario from producer view

3.2.1 Source of fry

In the market, the producer plays a vital role where the major input for the fish production is the fish fry. And most of the fish fry was fulfilled by local hatchery about 64.29% and 17.14% was occupied by the distant and Indian hatchery. Out of all 18.57% responded that their own hatchery fulfilled for the fish production.

Figures 3: Distribution of respondent based on the source of fry

3.2.2 Stocking month of fish seed

The study showed that 65% of the respondents preferred May/June, 26.67% preferred August/September and only 8.33% preferred February/March months for stocking fish seed.
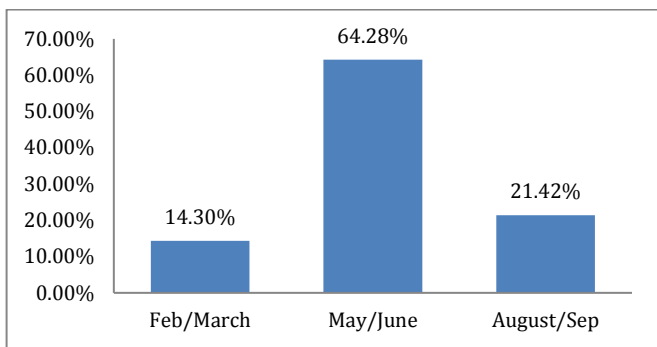
Figure 4: Distribution of respondent based on the stocking of fry

3.2.3 Location of market

After the completion of production it is followed by supply at the market. Location plays a major role to maintain the variation in price. Out of all respondents, 61.43% of respondents had access to the local market while 38.75% had access to the distant market. Also, 80% of farmer responded that there is a collection center for the fish product whereas 20% responded to the non-availability of the collection center.

Table 8: Distribution of respondent based on location of the market	
Categories	Frequency
Local market	43(61.43)
Distant market	27(38.57)
Total	70(100)

Figures in the parenthesis indicate the percentage of the total

3.2.4 Collection center

Table 9: Distribution of respondent based on collection center	
Categories	Frequency
Yes	56(80)
No	14(20)
Total	70(100)

Figures in the parenthesis indicate the percentage of the total

3.2.5 Marketing Channel

Market channel signifies how the product is being transferred in the market from farmer level to consumer-level through different stakeholders. Out of total respondent, 42.86% respondents responded that the fish is sold to commission agent/middleman followed by the wholesaler to retailer and finally to the consumer, 38.57% responded that they sold fish to wholesaler to retailer to consumer. 10% responded retailer directly came to take fish in farms and 8.57% responded locally available consumers are directly interacting for the consumption of fish.

Table 10: Distribution of respondent based on marketing channel involved	
Categories	Frequency
P-C	6(8.57)
P-M-W-R-C	30(42.86)
P-R-C	7(10)
P-W-R-C	27(38.57)
Total	70(100)

Figures in the parenthesis indicate the percentage of the total
Where P= Producer, C=Consumer, M=Middleman, W=Wholesaler & R=Retailer

3.2.6 Price determining factor

Price variation occurs through various reasons whereas major cause is due to active role of commission agent/ middleman. About 70 % respondent responded the major price determining factor in the market are commission agents and 30% responded that it is due to producers, i.e. price level at farm. The higher the cost of production the higher will be the price at the farm.

Table 11: Distribution of respondent based on price-determining factor	
Categories	Frequency
Commission agent/Middleman	49(70.00)
Producer	21(30.00)
Total	70(100)

Figures in the parenthesis indicate the percentage of the total

3.2.7 Margin fixed by producer per kg of fish

Average price per kg of fish was taken account. It was found that 57.14% farmer responded they keep the margin below Rs. 50 per kg of fish whereas the 42.86% responded they keep the margin of between Rs. 51 to 100.

Table 12: Distribution of respondent based on margin fixed by producer	
Less (Below Rs.50)	40(57.14)
Medium (Rs.51-100)	30(42.86)
High (above Rs.100)	00(00)
Total	70(100)

Figures in the parenthesis indicate the percentage of the total

3.2.8 Price difference between farms to market

The majority of respondents responded that there is a high fluctuation in price between farm and market. About 70% of respondents responded there is a difference of more than Rs. 100 between farm and market and 30% respondents responded the figure lies i.e. between Rs. 51 to 100.

Table 13: Distribution of respondent based on the price gap between farms to market	
Price	
Very less (Rs.10-Rs.26)	00(00)
Less (Rs.26-Rs.50)	00(00)
Medium (Rs.51 – Rs.75)	00(00)
High (Rs.76-Rs.100)	21(30)
Very high (above Rs.100)	49(70)
Total	70(100)

Figures in the parenthesis indicate the percentage of the total

3.2.9 Packaging material for fish

Out of all 32.86% respondent responded that packaging material used were plastic crates and similar number of respondents responded as thermo cool box whereas 17.14% responded bamboo and others(utensil) as a packaging materials for the fish.
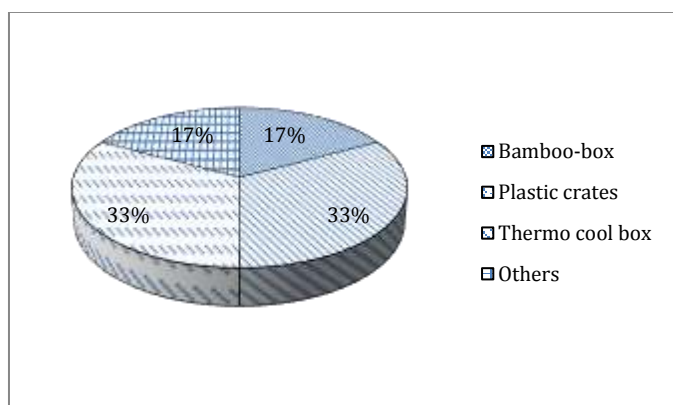

Figure 5: Distribution of respondents based on packaging materials used

3.2.10 Means of transportation

Among 70 respondents, 48.57 % responded that fishes are transported on cycle and 38.57 responded transportation is done on pickup van and remaining responded transportation means is on the motorbike. It shows that major transportation is done in the cycle for the local market whereas for the distant market pickup van are preferred much followed by motorbike.

Table 14: Distribution of respondent based on means of transportation	
Means	
Cycle	34(48.57)
Motorbike	9(12.86)
Pickup van	27(38.57)
Total	70(100)

Figures in the parenthesis indicate the percentage of the total

3.2.11 Selling price per kg of fish

After the production of fish, fish is sold in the market with the price ranges of Rs. 205 to Rs. 250 from the farm. This shows the mean selling price of the product is 228.14 with SD 12.94.

Table 15: Distribution of respondent based on selling price of fish

Categories	Observation	(Mean ± SD)	Min	Max
Selling price/kg	70	228.14 ± 12.94278	205	250

Figures in the parenthesis indicate the percentage of the total

3.3 Market scenario from wholesaler/Retailer view

3.3.1 Source of fish for Retailer

It was known that the sources of fishes for retailers are; middleman, producers and whole-sellers. Likewise, in the case of wholesaler they responded that their source is middleman and also producers as shown in the table;

Table 16: Distribution of respondent based on source of fish for retailer

Source from	Frequency
Middleman	46.67
Producer	40.00
Wholesaler	13.33
Total	

Figures in the parenthesis indicate the percentage of the total

3.3.2 Source of fish for Wholesaler

Table 17: Distribution of respondent based on source of fish for wholesaler

Source from	Frequency
Middleman	60.00
Producer	40.00
Total	

Figures in the parenthesis indicate the percentage of the total

3.3.3 Grading system

All respondent responded that 100 % graded the fish for selling, where did to find out 13.33% whether fish is dead or alive and 80 % responded that grading is done both for size as well as to find out whether fish is alive or dead, as shown below in the table;

Table 18: Distribution of respondent based on the grading system

Grading	Frequency
Yes	15(100)
No	0(00)
Total	15(100)

Figures in the parenthesis indicate the percentage of the total

Table 19: Distribution of respondent based on the basis of grading

Grading basis	Frequency
Size	2(13.33)
Dead/Alive	1(6.67)
Both	12(80)
Total	15(100)

Figures in the parenthesis indicate the percentage of the total

3.3.4 Cost of buying of fish

Table 20: Cost of buying per kg of fish

Categories	Observation	(Mean ± SD)	Min	Max
Buying price/kg	15	272.3333 ± 9.423881	250	280

Figures in the parenthesis indicate percentage of the total

3.3.5 Selling price for traders

It was observed that the price of fish per kg is with the mean 298.33 SD 30.21 that ranges from 250 to 350 as shown in table.

Also, it was found that the volume of fish sold per day is 52.47 with SD 13.24 that ranges from maximum value 75 kg to minimum value of 32 kg as shown in table no

Table 21: Selling price per kg of fish

Categories	Observation	(Mean ± SD)	Min	Max
	15	298.3333 30.21747	250	350

3.3.6 Volume of fish sold

Table 22: Amount of fish sold per day

Categories	Observation	(Mean ± SD)	Min	Max
	15	52.46667 13.24962	32	75

3.3.7 Test for significance

Table 23: Test for significance of price variation among producer traders and commission agent/middleman

		Marketing elements					
		Producer	Middleman	Trader	Total	F	P
Price received		228.14 ± 12.94[c]	270.67±9.03[b]	334.00±12.98[a]	250.40±40.29	469.07***	.001

Price received by producers from two marketing channels (without the middleman and with middleman) is significantly different at P <0.001

3.3.8 ANNOVA for between two marketing channel

Table 24: Variation on the price received by producer between two marketing channel

Price received by farmer from		Mean	t value	P
	Without middleman	225.37 ± 7.01	7.911***	0.001
	With middleman	239.83±8.25		

The calculated t value is highly significant at P < 0.01. Therefore, there is significant price variation between the price received by farmers with and without the middleman.

5.3.9 Necessity to Import fish from other places

It was found that out of total respondents 73.33% of respondents responded that it's required to import fish from other places. Out of 73.33% respondents they responded 100% of fish were imported from India only as shown in table no 25

Table 25: Distribution of respondent based on the necessity to import

Categories	Frequency
Yes	11(73.33)
NO	4(26.67)
Total	15(100)

Figures in the parenthesis indicate the percentage of the total
From where,

Table 26: Distribution of respondent based on the location from where fish is imported

Categories	Frequency
India	11(100)
Others	00(00)
Total	11(100)

Figures in the parenthesis indicate the percentage of the total

3.3.10 Reason for importing

There were several reasons for importing the fish. 60% of respondents responded that the reason of import was due to lower price and 26.67% responded reason as that the local production cannot fulfill the demand and 13.33% responded due to role of commission agent or middleman.

Table 27: Distribution of respondent based on reason for importing of fish

Categories	Frequency
Imported in lower price	9(60)
Local production can't fulfill demand	4(26.67)
Role of commission agent/Middleman	2(13.33)
Total	15(100)

Figures in the parenthesis indicate the percentage of the total

3.3.11 Problem ranking in the fish market

Table 28: Ranking of various problems in the market						
Problems	1	0.75	0.5	.25	Weightage	Index Value	Rank
Middleman/Commission agent	13	2	0	0	14.5	0.97	I
Support from zone office	11	2	1	0	13	0.87	II
Availability of consumer	2	2	5	6	7.5	0.5	IV
Indian fish market	6	9	0	0	12.75	0.85	III

3.4 Post-harvest management

3.4.1 All fish are sold in a day

All respondent responded that all fish were not sold in a day. All out of that 86.67%responded for the storage of unsold fishes whereas 13.33% responded that remaining fish will be wasted out.

Table 29: Distribution of respondent based on whether all fish are sold	
Categories	Frequency
Yes	0(00)
No	15(100)

Figures in the parenthesis indicate the percentage of the total

3.4.2 Techniques applied on unsold fish

Out of 15 respondents responded 86.67% of traders preferred storage technique for minimizing the post-harvest loss and 13.33% responded for no use of techniques to minimize the loss.

Table 30: Distribution of respondent based on techniques applied on unsold fish	
Categories	Frequency
Storage	13(86.67)
Waste	2(13.33)
Total	15(100)

Figures in the parenthesis indicate the percentage of the total

3.4.3 Deterioration ranking of various fish species

Table 31: Ranking of various fish species							
Fish species	1	.8	0.6	0.4	0.2	weightage	Index	Rank
Rohu	0	2	4	5	4	6.8	0.45	III
Naini	7	5	3	0	0	12.8	0.85	II
Mangur	0	1	3	4	7	5.6	0.37	V
Silver/Bighead	8	6	10		0	13.4	0.89	I
Common carp	0	1	4	6	4	6.4	0.43	IV

Spoilage in fish and shellfish depends on species and chemical components. Those changes along with enzymatic and microbial induced activities are involved in the degradation of muscles (Abreu, Losada, Maroto, & Freire, 2010)

3.4.4 Ways / Mechanism of Storage

For the post-harvest management 53.33% respondent responded they use both ice and refrigerator, 50.00% responded for the use of ice only and 6.67% responded use of refrigerator only.

Table 32: Distribution of respondent based on the mechanism of storage	
Categories	Frequency
Ice	6(50.00)
Refrigerator	1(6.67)
Both	8(53.33)
Total	15(100)

Figures in the parenthesis indicate the percentage of the total

3.4.5 Chance to earn extra-money

It was found that there was less chance to earn extra money on the storage of fish. 86.67% disagreed with the statement while only 13.33% of them agreed it.

Table 33: Distribution of respondent based on earning extra-money from storage	
Categories	Frequency
Yes	2(13.33)
No	13(86.67)
Total	15(100)

Figures in the parenthesis indicate the percentage of the total

3.4.6 Support from zone for marketing

Table 34: Distribution of respondent based on support from zone office			
Categories	Frequency		Total
	Yes	No	
Producer	00(00)	70(100)	70(100)
Wholesaler/Retailer	00(00)	15(100)	15(100)

Figures in the parenthesis indicate percentage of the total

3.5 Marketing scenario from consumer view

3.5.1 Consumption Rate

It was found that the consumption rate was higher, out of total respondents, 46.67% consumed more than twice in a month. Likewise, 33.33% responded consumption of once a month and 20% responded for the consumption twice in a month.

Table 35: Distribution of respondent based on the consumption rate of fish	
Categories	Frequency
Once	5(33.33)
Twice	3(20.00)
More than twice	7(46.67)
Total	15(100)

Figures in the parenthesis indicate the percentage of the total

3.5.2 Response towards fish market condition

Out of total consumer respondent, 46.67% responded for the need to improve more in market. Also 33.33% responded for its in medium condition and 20% responded for good.

Table 36: Distribution of respondent based on response towards market condition	
Categories	Frequency
Good	3(20.00)
Medium	5(33.33)
Need to improve more	7(46.67)
Total	15(100)

Figures in the parenthesis indicate percentage of the total

3.5.3 Response towards price

Out of the total consumer respondents, it was found that 66.67% responded that the average price of fish per kg was Medium and the remaining 33.33% responded that the price is high.

Table 37: Distribution of respondent based on response to the price of fish in the market	
Categories	Frequency
Expensive	5(33.33)
Medium	10(66.67)
Total	15(100)

Figures in the parenthesis indicate the percentage of the total

3.5.4 Preference over stored fish

It was found that no one consumer prefers the stored fish. Hence, alive fishes have high demand in the market.

Table 38: Distribution of respondent based on preference over stored fish	
Categories	Frequency
No	15(100)
Yes	0(00)
Total	15(100)

Figures in the parenthesis indicate the percentage of the total

4. CONCLUSION

1. Commission agents/Middlemen are the major problem in the marketing channel.
2. There is a significant price variation between the price received by farmers with and without the middleman.
3. Rohu species is the most preferred fish by the consumer.

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