ZIBELINE INTERNATIONAL PUBLISHING

Food and Agri Economics Review (FAER)

DOI: http://doi.org/10.26480/faer.01.2021.28.35

ISSN: 2785-9002 (Online)
CODEN: FAERCS

RESEARCH ARTICLE

PRODUCTION AND MARKETING SYSTEM OF FISH IN DHANUSHA, NEPAL

Shilpa Koirala[a*], Dilip Kumar Jha[b], Abishek Lamsal[a], Ansu Adhikari[a]

[a] Agriculture and Forestry University, Rampur, Chitwan, Nepal.
[b] Department of Aquatic Resources, Agriculture and Forestry University, Rampur, Chitwan, Nepal.
**Corresponding Author Email: shilpakoirala33@gmail.com*

ARTICLE DETAILS

Article History:

Received 29 April 2021
Accepted 31 May 2021
Available online 03 June 2021

ABSTRACT

Aquaculture is an important agriculture sector in Dhanusha district with the involvement of large number of farming community. An interview-based questionnaire survey of 45 randomly selected fish farmers and 13 fish traders in fish block area of Dhanusha district, Nepal was carried out to appraise current situation of Production and marketing system of fish farming during the period of February to April, 2020. Majority of the farmers (86.76%) had done fish farming as main occupation and was found to be profitable with the average productivity of 5.53 Mt/ha/year and B/C ratio of 1.37. Most of the farmers were practicing carp polyculture however, monoculture and integrated fish farming was also found to be done by few respondents. Fish produced were sold in local market, adjacent districts and also to distant markets. The findings showed that traders were involved in marketing system of fish of which 59.65% of the total was sold to the wholesalers, 30.49% to the retailers and 9.87% was sold directly to the consumers. Commonly used means of transportation were bicycle, motorbike and pickup vans. The study also revealed that farmers were facing several problems like lack of technical knowhow, untimely availability of feed and other inputs, disease and water quality problem, lack of well managed commodity market, poor storage facilities etc. which needs to be addressed to enhance the fish production and marketing efficiency in the study area.

KEYWORDS

Aquaculture, Commodity market, Farmers, Productivity, Study

1. INTRODUCTION

Nepal is rich in water resource which gives huge opportunity for fish farming. Inland capture fisheries and aquaculture is supported by the diverse agro ecological zones providing suitable habitat for different fish species. Out of 252 total fish species reported in Nepal 11 species are under commercial farming which includes; 7 Carps species, 1 Perch (Tilapia), 2 catfish and 1 trout species (Shrestha, 2019). Aquaculture represented 4.18% and 1.13% of the agriculture GDP and National GDP respectively (CFPCC,2018/19). The number of households involved in fish farming is 54,237 with the total of 143,241 people employed in this sector. Annual fish production of Nepal is 91832 metric tons with the contribution of 70832 metric tons from aquaculture and 21000 metric tons from the inland capture fisheries (CFPCC, 2018/19).

Farmers in Nepal have a long history of fishing but modern aquaculture started with the introduction of exotic Carps in the early 1950s. 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 breeding techniques for indigenous major carps; Rohu, Naini and Bhakur established in the late 1970s resulted in the switching over to a true polyculture system of fish farming in Nepal which has contributed considerably to increase in production (Kunwar and Adhikari, 2016/17). Integrated aquaculture production with livestock and other horticulture crops is practiced in different parts of the country with the purpose of optimum utilization of the resources and high profit to the farmers (FAO, 2005). Aquaculture has high prospects and can be one of the important sectors for the utilization of available cultivation areas and improving condition of rural farmers in Nepal (Katz, 1987). At present carp polyculture is dominant, most common and is widely disseminated in the southern part of the country. Fish production and consumption in Terai belt is higher in Nepal.

Dhanusha 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 2018/2019, there was total of 2442 fish ponds with the production of 5501817 kg annually (DADO, 2018/2019). Fish farm occupies 1123.17 hectares of land within the district. Dhanusha has huge fish production potentiality with annual productivity of 4.89 metric tons per hectare (CFPCC, 2018/19). 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. The domestic output still falls short of demand. Quite limited export of aquaculture products is done and imports far exceed exports (Labh et al., 2017). Huge amount of fresh and frozen fish, as well as fish meal is imported mainly from India and other countries. Last year data showed the import of 9,334 Mt of fish in Nepal (CFPCC, 2018/19). There is a need to fulfill the gap between fish demand and supply by the domestic production itself. Proper planning and development in this sector is crucial for increasing the production. Information on production and marketing framework of the farming system forms a good base for planning and development in this sector. Considering the above fact, this study is designed to find out the production and marketing systems of fish in fish block of Dhanusha. This study will help to identify the actual situation, hindrance in fish production and marketing system.

Quick Response Code	Access this article online	
	Website: www.faer.com.my	**DOI:** 10.26480/faer.01.2021.28.35

Cite The Article: Shilpa Koirala, Dilip Kumar Jha, Abishek Lamsal, Ansu Adhikari (2021). Production and Marketing System of Fish in Dhanusha, Nepal. *Food and Agri Economics Review, 1(1): 28-35.*

2. Materials and Methods

2.1 Study area

Fish block (Chhireswornath Municipality and Batteswor Rural Municipality) was chosen as the study area for the survey which lies in Dhanusha District, Province 2, Nepal. Commercial fish farmers were considered the survey population and thus were included in sampling. Out of 150 fish farmers registered in fish block, Dhanusha; 45 actively involved fish farmers were selected through simple random sampling technique. Similarly, 13 traders were selected randomly for survey purpose. Survey was conducted from February 2020 to April 2020.

2.2 Data collection

Primary data were collected using semi-structured pre-tested interview schedule, Focus Group Discussion (FGD) and Key Informant Interview (KII). FGD was conducted in a group of 8 progressive farmers during preparation of checklist and KII was conducted with the representative of local stakeholders, lead farmers, extension workers, head of community-based organization etc for the cross verification of data. Similarly, secondary data were collected from different documents and publications from PMAMP, Agriculture Knowledge Centre, Agriculture Census, NARC, FAO, CFPCC, journal articles and other relevant reports and publications.

2.3 Data analysis technique

Qualitative and quantitative analysis was done using SPSS version 25 and MS-Excel. Indexing was used in the ranking of fish production and marketing problems. Indexing was computed by using following formula:

$I_{prob} = \Sigma (S_i F_i)/N$
Where,
I_{prob} = Index value for intensity
Σ = Summation
S_i = Scale value of i^{th} intensity (I =1,0.83,0.66,0.49,0.32, 0.15) where 6 problems were selected.
(I=1, 0.86, 0.72, 0.58, 0.4, 0.29, 0.15) where 7 problems were selected.
F_i = Frequency of i^{th} response
$\Sigma (S_i F_i)$= Score. This was used to score the consumer preference of different fish species.
N = Total number of respondents

On the basis of ranking of each problem by the individual respondent, final index value was obtained which revealed the severity of each of the farmer's problems.

3. Results and Discussion

3.1 Socioeconomic and demographic characterization

From the study, it was found that most of the fish farmers were male 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. The majority of farmers (51.11%) were of age group 31-40 with maximum age of 58 and that of minimum 24. Similarly, 17.78% respondent farmers had no formal education, while others were literate but the number of farmers getting higher education was found to be low. Likewise, most of the fish farmers in fish block were involved in fish farming as their primary occupation. 86.67% of fish farmers were engaged in fish farming as their main occupation while 13.33% were involved in other activities like agriculture, poultry, small business, trading and services. Farmers were involved in fish farming from long time ago. Some of the farmers did fish farming as traditional occupation while others switched their occupation to fish farming later as they find it more profitable and feasible in the area. Farmers had experience of fish farming in maximum of 30 years and minimum of 1 year with the average experience of 9.22 years. Fish farming had been a major source of income to the fish farmers in the study area. The annual income of the farmers ranged from minimum of NRs 300000 to maximum of NRs 600000. Large scale & experienced farmer were found to have higher income compared to the small-scale farmers with little experience. Based on the land holdings of farmers, 5 different categories were made. It was found that the land holding of farmers ranged from minimum of 0.12 ha to maximum of 9.47 ha with the average of 2.79 ha.

Table 1: Socioeconomic and demographic characterization of the fish farmers

Characteristics	Frequency (n=45)	Percentage (%)
Gender		
Male	44	97.78
Female	1	2.22
Age categories (Yrs)		
21-30	7	15.56
31-40	23	51.11
41-50	12	26.67
Above 50	3	6.67
Educational Status		
No formal education	8	17.78
Primary	7	15.56
Lower Secondary	5	11.11
Secondary	10	22.22
Higher Secondary	10	22.22
University	5	11.11
Main Occupation		
Fish farming	39	86.67
Others	6	13.33
Previous Occupation		
Agriculture/Poultry	15	33.33
Business/Trading	5	11.11
Fish farming	14	31.11
Foreign employment	9	20
Job/Services	2	4.44
Fish Farming experience (Yrs)		
Less than 5	11	24.44
5-10	23	51.11
10-15	5	11.11
15-20	2	4.44
Above 20	4	8.89
Annual Income (NRs)		
100000-300000	4	8.89
300000-500000	4	8.89
500000-700000	14	31.11
700000-1000000	9	20
>1000000	14	31.11
Land holdings		
<1ha	11	24.44
1ha-2ha	12	26.67
2ha-3ha	4	8.89
3ha-4ha	10	22.22
>4ha	8	17.78

3.2 Pond Information

3.2.1 Total Pond area coverage and number of fish pond of the respondent fish farmers

The total pond area coverage was 419.09 ha. Out of this, individual farmers' pond area coverage ranged from minimum of 1.35ha to maximum of 67.7ha with the average pond area of 9.41ha. The number of fish pond of the farmers ranged from 3 to 65 with the average number of pond 13.64.

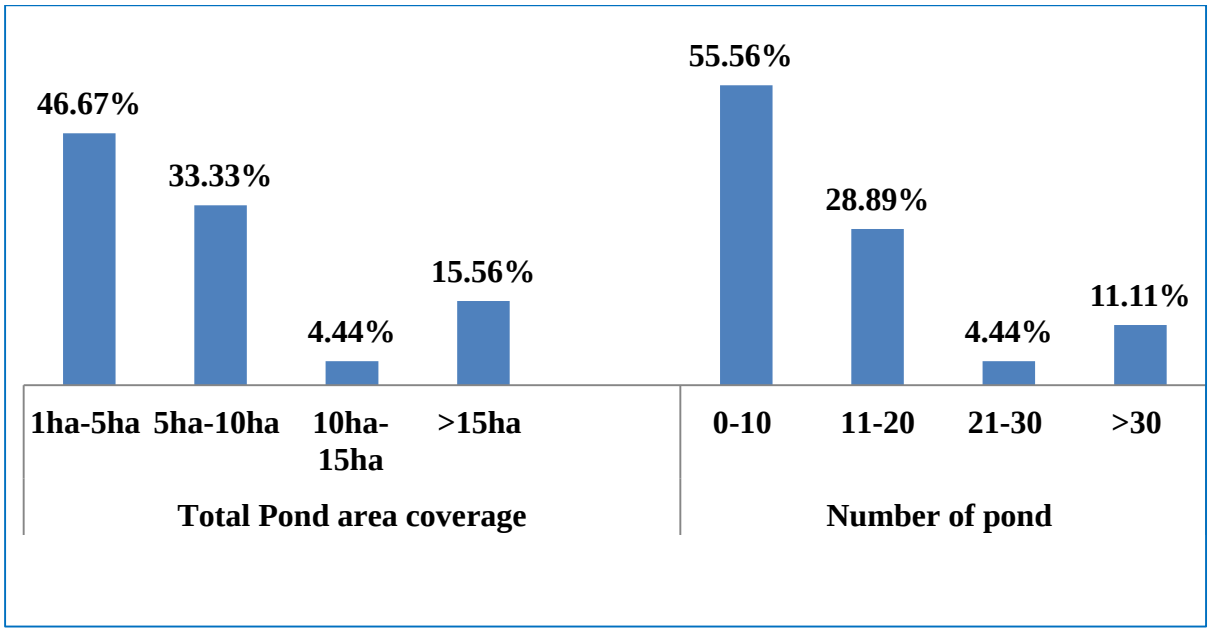

Figure 1: Total pond area coverage and number of pond of the fish farmers (%)

3.2.2 Land ownership for fish farming

It was found that most of the farmers had taken land on lease for fish farming. 20% of the farmers were doing fish farming in their own land whereas 17.78% of farmers had taken land on rent and the remaining 62.22% farmers were using their own land as well as lease land. Farmers taking land on lease was due to the fish farming done in large scale and the farmers didn't have adequate land for the farming. Similarly, unfeasibility of the land and use of land in other agriculture purpose was also the case in some of the farmers.

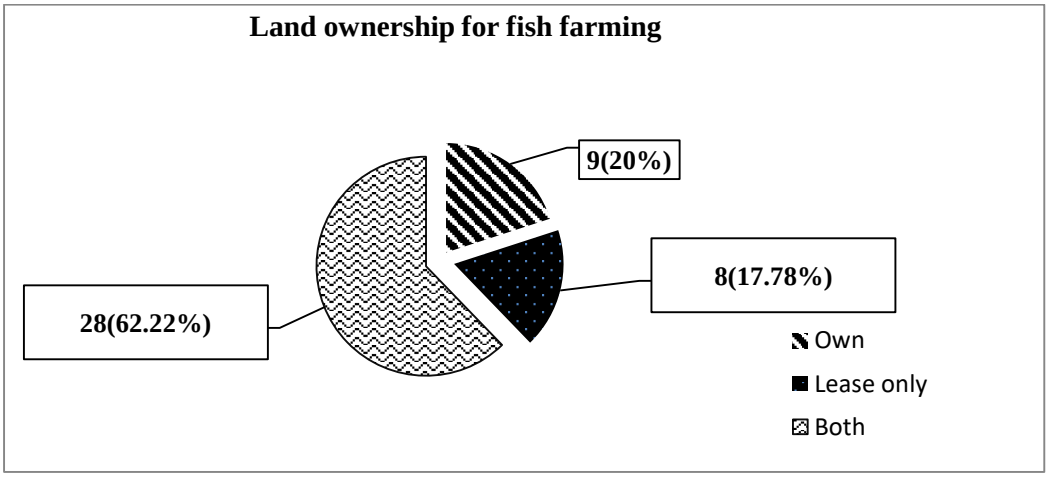

Figure 2: Land ownership for fish farming

3.2.3 Water source of fish pond

Main source of water of fish pond was found to be underground water which was used for irrigation of 94.6% of ponds. However few farmers used irrigation canal from nearby water source like rivers, small canals. Ponds with irrigation canal and rainfall as the source of water were found to be used seasonally only due to scarcity of water all year round.

Table 3: Water source of fish pond

Source of water	No. of ponds (n=603)	Percentage (%)
Underground water	572	94.86
Irrigation canal	22	3.65
Rainfall	9	1.49

3.3 Pond Inputs

3.3.1 Type of culture system and cultured fish species

Farmers mostly followed polyculture system of fish farming. 75.56% of the fish farmers followed this system. 11.11% of farmers were found to be involved in both monoculture and polyculture practices. Farmers were found to practice monoculture of mangoor and other species along with carp polyculture. Likewise, 13.33% of fish farmers were found to be involved in integrated system of fish farming. They usually kept poultry and planted some fruit crops along with fish farming. All the respondent farmers were found to culture major Carp species which includes both Indigenous carp species (Rohu, Naini, Bhakur) and Exotic carp species (Common carp, Silver carp, Bighead carp and Grass carp). Beside these species some farmer also kept Rupchand, Mangoor, Pangas, Blind carp and some of local species like Bhuna, Mohi, Patara, Golhi, Chaguni, Pothia, Budhuna etc. The result showed that about 96% of the total fish farming was of the major carp species and only 4% was of other species. Only few farmers stock other species in few numbers along with the carps either for

household consumption or for selling. However major carp species was found much dominant due to their good production and easy market.

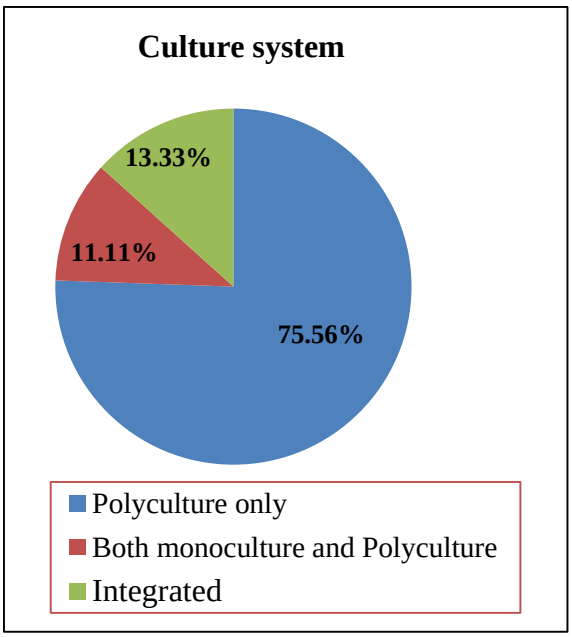

Figure 3: Type of culture system

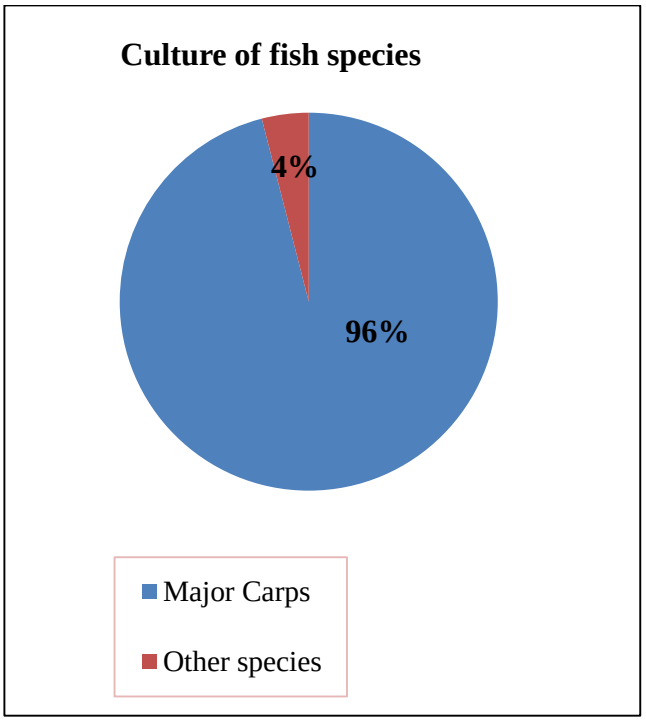

Figure 4: Cultured fish species

3.4 Fish Production

Total annual fish production by 45 fish farmers was 1391.07 MT with Naini having highest production of 334.61 Mt and that of Rohu was 304.68 Mt. Maximum production of Chhadi of Rohu and Naini was done followed by Silver carp and bighead carp with annual production of 254.21 and 220.67 Mt respectively. Production of other fish species which include Mangoor, Pangas, Roopchand, Pothiya and other local species was comparatively less with total annual production of 54.74Mt.

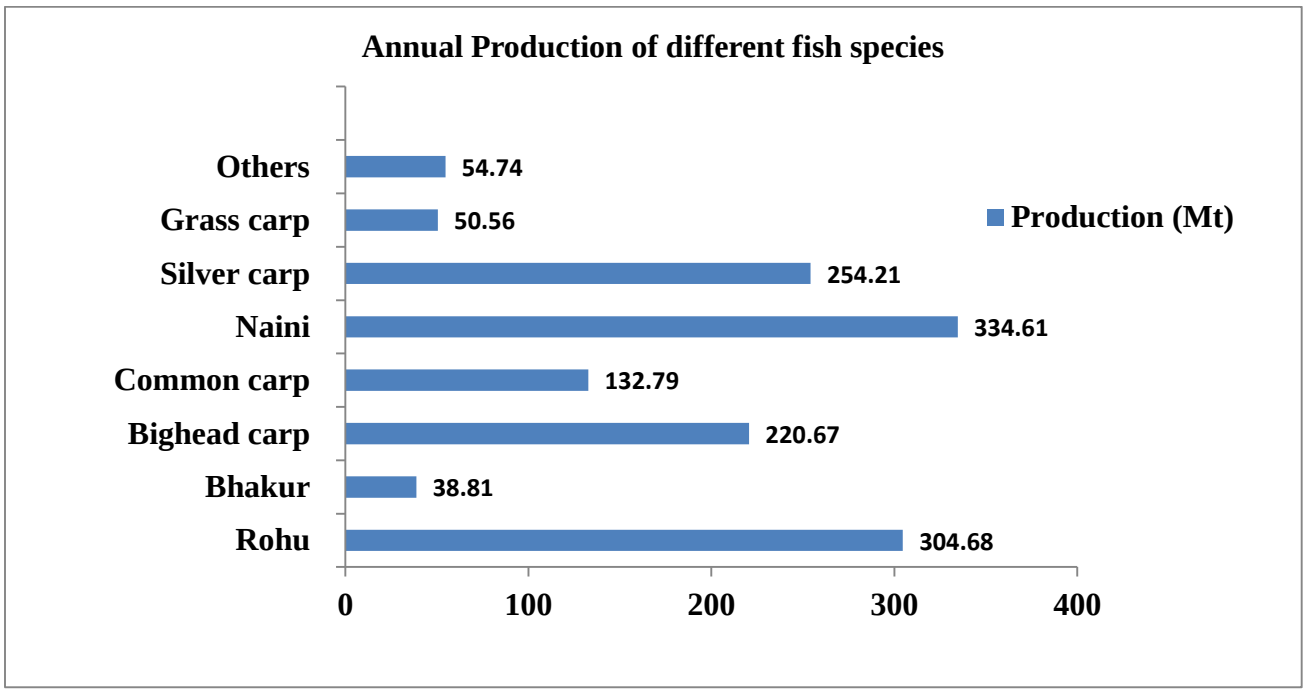

Figure 5: Annual production of different fish species

3.5 Cost and Return of fish farming

Average cost of fish production was calculated per unit hectare of the pond considering both variable cost and fixed cost. Table below suggest that the variable cost accounts for 67.55% of total cost and fixed cost accounts for 32.98% of total cost of fish farming. Cost of feed was found to be highest with 37.46 % of total cost. Likewise, cost of pond construction was found to be highest among the fixed cost with share of 14.41% of total cost.

3.6 Profitability estimates of fish farming in the study area

Profitability estimate was done in the study area calculating the total average cost and gross return per hectare of pond. The average fish production per unit hectare of pond was found to be 5.53 Mt. considering the price of different fish species the average farm gate price was found to be NRs. 290 per Kg of fish. Total revenue from fish farming depicted from one hectare of pond was NRs. 1603700. Total annual benefit was found to be NRs.431700 considering only variable cost. B/C ratio was found to be 1.37. Similar study was carried out in Fish Super zone area of Dhanusha district and the B/C ratio obtained was 1.69 and in Chitwan district, Nepal the B/C ratio for fish farming was found to be 1.63 (Sharma et al., 2018; Subedi et al., 2019). This shows that the fish farming in the study area was profitable.

Table 4: Cost and Return of fish farming		
Particulars	Amount (NRs)	Share on total cost (%)
Variable cost		
Cost of fingerlings/seed	100000	5.76%
Cost of feed	650000	37.46%
Pond management	50000	2.88%
Cost of fuel and electricity	15000	0.86%
Cost of lime	52000	3.00%
Cost of fertilizers and manure	110000	6.34%
Cost of medicine	30000	1.73%
Labor cost	150000	8.65%
Transportation costs	15000	0.86%
Total variable cost	1172000	67.55%
Fixed cost		
Land rent	120000	6.92%
Cost of Pond construction	250000	14.41%
Cost of Water pump	18000	1.04%
Cost of Boring/well	50000	2.88%
Cost of Other machineries	10000	0.58%
Cost of fishing net	45000	2.59%
Cost of farm building/store	70000	4.03%
Total fixed cost	563000	32.45%
Total cost	1735000	100.00%

Table 5: Profitability estimates of fish farming		
Cost of fish farming / Year		
Total variable cost (NRs./ha)	1172000	67.55%
Total fixed cost (NRs./ha)	563000	32.45%
Total cost (NRs./ha)	1735000	100%
Return of fish farming		
Productivity (Mt/ha)		5.53
Average price of fish (NRs./Kg)		290
Total revenue (NRs./ha)		1603700
Benefit Cost Analysis		
Total average cost		1172000
Gross return		1603700
Total benefit		431700
B/C ratio		1.37

3.7 Loan borrowing tendency of fish farmers

It was found that most of the farmers borrowed loan for farming. The figure below shows that 62.22% of farmers borrowed loan and 37.78% of farmers run farm through their own capital. Most of the farmers were found to borrow loan from banks and few of them borrowed from cooperatives and relatives & friends. 64.29% of the loan borrowers got Agriculture loan at the rate of 7% interest whereas remaining farmers i.e. 35.71% had not received the service and the interest rate varied from 14-36% based on the source where they got loan from. The average amount of loan was found to be NRs.3100000 per loan borrower farmers. Lack of capital and high interest was a major problem for most of the farmers.

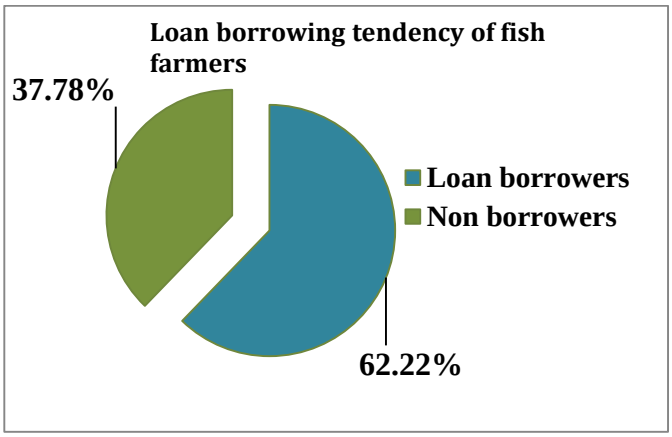

Figure 6: Loan borrowing tendency of fish farmers

3.8 Marketing of fish

3.8.1 Marketing channel used by the fish farmers

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 Lahan, Biratnagar, Dharan and Kathmandu. 59.65% of total fish produce is sold to the wholesalers, 30.49% to the retailers and 9.87% 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).

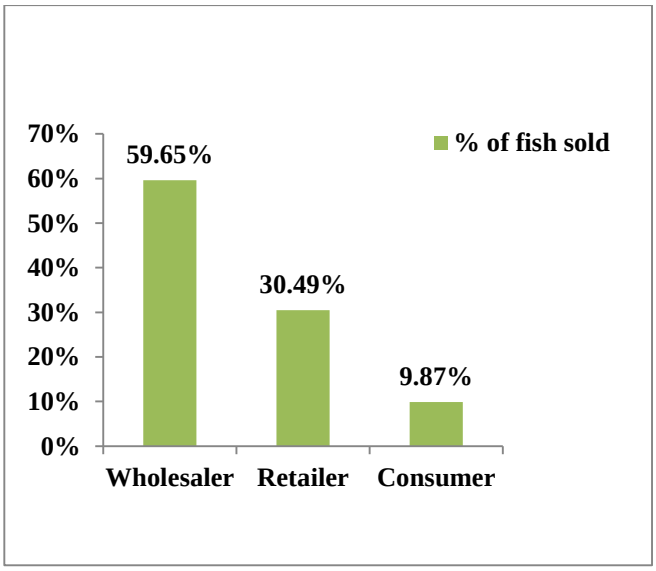

Figure 7: Marketing channel used by the fish farmers

3.8.2 Consumer preference for fish species

Among the major carp species; the most preferred one by the consumers was Rohu followed by Bhakur. 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. However Silver fish was found to be highly preferred in hotels and restaurants.

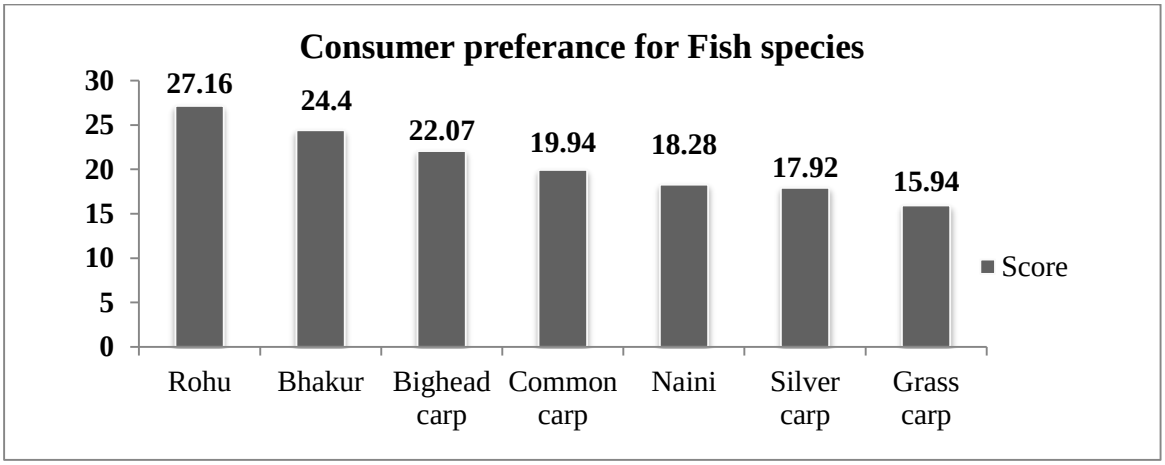

Figure 8: Consumer preference for fish species

3.8.3 Market Price of Fish in Dhanusha district

Price of fish varied due to number of factors like season, location of sale, size and species of fish and production of fish. As presented in Table 6, study showed that price of table fish is higher than the Chhadi fish. Among the table fish; Bhakur fetched highest price with the average retailer price of NRs. 530 followed by Rohu with retailer average price of NRs. 390/Kg. Mangoor, local fishes like Pothiya, Bhuna, Vaura and Pangasius fetched comparatively lower price at all levels. The average farm gate Price, wholesale price and retail price of fish species was found to be NRs. 292.30/Kg, NRs.311.92/Kg and NRs. 340/Kg with average marketing margin of NRs. 47.69/Kg. Higher fluctuation in price was found among the trader in the study area.

Table 6: Market price of fish in Dhanusha

S.N	Species of Fish	Farm gate average Price (Rs/Kg)	Wholesaler average Price (Rs/Kg)	Retailer average price (Rs/Kg)	Marketing margin (Rs/Kg)
A.	**Chhadi fish**				
1	Rohu	220	240	260	40
2	Naini	180	200	235	55
B.	**Table fish**				
1	Rohu	340	355	390	50
2	Naini	280	300	335	55
3	Bhakur	450	490	530	80
4	Silver carp	300	310	340	40
5	Bighead carp	330	340	370	40
6	Grass carp	310	320	350	40
7	Common carp	330	350	375	45
8	Pangas	220	245	260	40
9	Mangoor	220	240	255	35
10	Roopchand	400	415	450	50
11	Local fish	220	250	270	50

3.8.4 Materials used for Packaging of fish

Materials used depend upon the number of fish they pack and the means of transportation they used for carrying the fish. Local traders were found to use crates, aluminum pots and silver utensils whereas wholesalers who carry larger amount of the live fish used drums in order to carry to longer distance. While packaging small hatchlings farmers used a polythene bag which is filled with oxygen and water. Research in the study area revealed that 51% of the traders used plastic crates as packaging material, 22% used aluminum pots and 27 % used both of them.

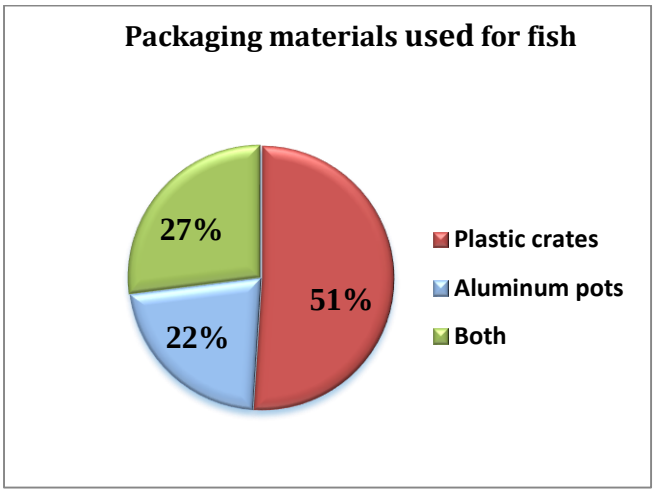

Figure 9: Materials used for Packaging of fish

3.8.5 Means of transportation and storage mechanism used for carrying fish

There was no specially designed vehicle for carrying fish. Mostly bicycle and motorbike was used for carrying fish to the local market while pickup vans was used for longer route and for carrying larger number of fish. 30% of them used cycle for transportation of fish, 36% used motorbike whereas 34% used pickup van and other four wheelers as the means for transportation for carrying fish. Storage problem was found prominent in the study area. 53.84% of traders didn't use any storage mechanism. Due to the absence of suitable storage method traders preferred selling the fish in minimum price then storing it. 38.47% of the farmers were found to use Ice as storage medium and only 7.69% farmers were found to use refrigerator as storage medium. Traders reported that storing fish in refrigerator degrade the quality of fish compared to that stored in Ice. Most of the traders only trade the number of fish they were sure to be sold in the market to avoid spoilage. It was aligned with the finding that 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).

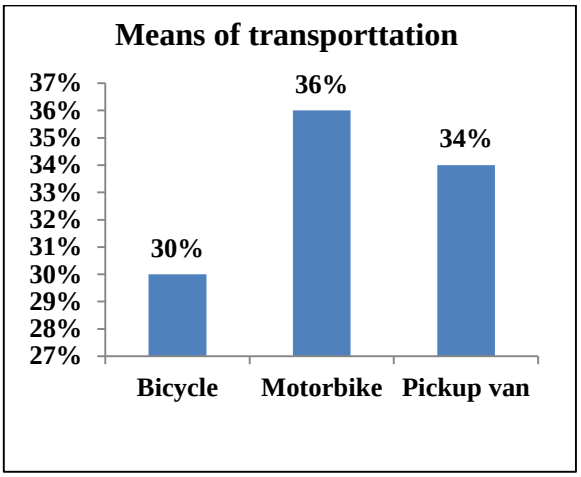

Figure 10: Means of transportation for carrying fish

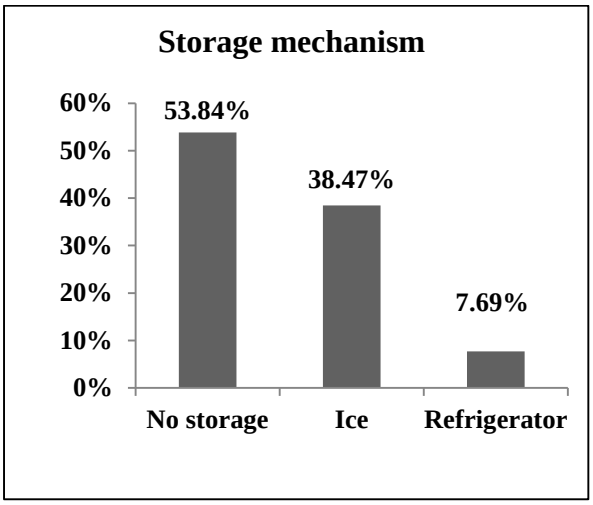

Figure 11: Storage mechanism used by the fish traders

3.9 Constraints of fish farming

Despite the huge potentiality of fish farming, farmers were facing many problems regarding both production and marketing of fish. The severity of problem was identified by ranking with appropriate score.

3.9.1 Constraints on fish Production

Lack of technical assistance and poor technical knowledge was the most serious problem in the study area followed by lack of quality feed and untimely availability of feed and other inputs. Similarly, disease and water quality problem, lack of manpower and labor, flood problem etc are faced by the farmers.

Table 7: Constraints on fish Production

Problems	Index	Ranking
Lack of technical assistance and poor technical knowledge	0.80	I
Lack of quality feed and untimely availability of inputs	0.78	II
Disease and water quality problem	0.68	III
Lack of manpower and labor	0.62	IV
Lack of modern equipment and resources	0.49	V
Flood in the pond area	0.47	VI
Lack of social security and Poaching	0.34	VII

3.9.2 Constraints on fish marketing

Lack of well managed commodity market was found to be ranked as the main problem faced by majority of farmers and traders followed by price fluctuation and low market price. Similarly poor storage and processing facility, Road and transportation problem, no market information and so on are the problems that need to be addressed to improve the marketing system of the fish in the study area. Similar result was found which was aligned with the study findings state that Lack of marketing infrastructure, lack of cold storage facilities, poor quality fingerlings, feed and lack of technical knowledge are the major issues; the fish industry is facing (Gautam, 2015).

Table 8: Constraints on fish marketing

Problems	Index	Ranking
Lack of well managed commodity market	0.86	I
Price fluctuation and low market price	0.80	II
Poor storage and processing facility	0.75	III
Road and transportation problem	0.62	IV
No market information	0.60	V
Indian market dependent	0.37	VI

4. Conclusion

Fish farming is one of the growing enterprises in Dhanusha district providing employment opportunities to a large number of households. With proper technical, economical backup and proper service and facilities; fish farming can be a highly profitable business contributing to food and economic security. Despite huge potentiality farmers and traders in Dhanusha are facing different constraints related to production and marketing of fish and other inputs. So, various factors which influence the overall subsector must be addressed. This will help further increase the economic return of fish production in the study area and the overall national aquaculture scenario.

Acknowledgement

The authors are grateful towards Agriculture and Forestry University (AFU) Rampur, Chitwan for funding the research and Prime Minister's Agriculture Modernization Project, Project Implementation Unit (PIU) Fish Block , Dhanusha for their immense help and cooperation. We would also like to acknowledge the respondent farmers in the study area and all the supporting hands.

References

Budhathoki, R., Sapkota, B., 2018. Acta Scientific Agriculture (ISSN: 2581-365X). Retrieved from https://actascientific.com/ASAG/pdf/ASAG-02-0180.pdf

CFPCC. 2018/19. Annual Report 2075/76. Central Fisheries Promotional and Conservation Centre, Kathmandu.

FAO. 2005. National Aquaculture Sector Overview. Retrieved from FAO website: http://www.fao.org/fishery/countrysector/naso_nepal/es#tcN7015F

Gautam, N., 2015. Challenges of Freshwater Fisheries in Nepal L: A Short Overview. International Journal of Applied Sciences and Biotechnology, 579-583.

Husen, M., 2019. Fish Marketing System in Nepal: Present Status and Future Prospects. International Journal of Applied Sciences and Biotechnology, Pp. 1-5.

Katz, A., 1987. The Role of Aquaculture in Nepal: Towards Sustainable Development, Pp. 222-224.

Kumari, M., 2015. Retrieved from Kumari M Fish marketing system in Chitwan and Kathmandu.

Kunwar, P.S., Adhikari, B., 2016/17. Status and development trend of aquaculture and fisheries in Nepal. Nepalese Journal of Aquaculture and Fisheries, Pp. 1-11.

Labh, S.N., Kayastha, B.L., Shakya, S.R., Kushwaha, M.P., Vaidya, S.R., Chitrakar, P., 2017. Present status and future prospectives of freshwater. International Journal of Fisheries and Aquatic Studies, Pp. 95-97.

Sharma, T., Dhakal, S.C., Kattel, R.R., Gharti, K., Lamichhane, J., 2018. Economics of fish production at Chitwan district, Nepal. Journal of Agriculture and Natural Resources, Pp. 21-31.

Shrestha, M.K., 2072. Aquaculture Development in Nepal and Current Needs. Agriculture and Forestry University.

Shrestha, T.K., 2019. Ichthyology of Nepal. B.J Shrestha Publisher.

Subedi, P., Pandit, N.P., Mahato, N.K., Karki, M., Uprety, A., 2019. Economic analysis of fish production using different feed types practiced in Dhanusha district, Nepal. Journal of Agriculture and Natural Resources, Pp. 252-264.