FISH MARKETING SYSTEMS IN CHITWAN AND KATHMANDU

A dissertation submitted for the partial fulfillment of

Master Degree in Zoology.

(Fish and Fisheries)

By

Madhu Kumari

Roll No. : 6186

Batch No. 065/066

T.U.Reg No. 25564/90

To

Central Department of Zoology
Tribhuvan University, Kirtipur, Kathmandu, Nepal
2015

RECOMMENDATION

This is to recommend that the thesis entitled 'Fish Marketing Systems in Chitwan and Kathmandu' had been carried out by Madhu Kumari for the partial fulfillment of Master's Degree of Science of Zoology with a special paper on Fish and Fisheries. This is her original work and had been carried out under my supervision. To the best of Knowledge, this thesis work had not been submitted for any other degree.

.....
Dr. Surya Ratna Gubhaju
(Supervisor)
Professor
Central Department of Zoology
Tribhuvan University
Kirtipur, Kathmandu

Date: .....

LETTER OF APPROVAL

On the recommendation of supervisor Prof. Dr. Surya Ratna Gubhaju, this thesis submitted by Madhu Kumari. 'Fish Marketing Systems in Chitwan and Kathmandu' is approved for the examination and submitted to the Tribhuvan University in partial fulfillment of the requirements for master's degree of Science in Zoology with special paper on Fish and Fisheries.

Date :- .....

.....

Prof. Dr. Ranjana Gupta

Head of Department

Central Department of Zoology

Tribhuvan University

Kritipur, Kathmandu, Nepal

CERTIFICATE OF ACCEPETANCE

This thesis work submitted by Madhu Kumari entitled ‘Fish Marketing Systems in Chitwan and Kathmandu’ has been approved as a partial fulfillment for the requirements "Master's Degree of Science in Zoology with special paper on Fish and Fisheries.

EVALUATION COMMITTEE

.....
Prof. Dr. Surya Ratna Gubhaju
(Supervisor)
Professor
Central Department of Zoology
Tribhuvan University
Kirtipur, Kathmandu

.....
Prof. Dr. Ranjana Gupta
Head of Department
Central Department of Zoology
Tribhuvan University
Kirtipur, Kathmandu, Nepal

.....
External Examiner

.....
Internal Examiner

Date : .....

Acknowledgements

I am very much thankful to my respected supervisor, Prof. Dr. Surya Ratna Gubhaju, Professor, Tribhuvan University, Kritipur of his immense help constant guidance and inspirations whom without this work could not be successful.

I would like to put my regards to Prof. Dr. Ranjana Gupta, Head of the Zoology Department, TU for her valuable suggestion and kind guidance during the survey work. I would also like to thank other teachers and staff of Central Department of Zoology for their co-operation.

I am really thankful to my family especially to my husband for his easy way to help me from data collection to print out of this thesis.

Madhu Kumari

Abstract

In general fish farming was practiced in small scale in Nepal. So, small harvest from both capture/culture were found sold in the vicinity of the production centers. There existed strong competition between wet fishes of Nepal with Indian products. The fish from India was more consistent in size and supply, whereas the fish from Nepal was smaller in size but considered good quality and taste. A number of freshwater indigenous fish species of economic value Asla (*Schizothorax* spp.), Sahar (*Tor* spp.), Katle (*Neolissocheilus hexagonolepis*) and Bam (*Anguilla* spp.) from capture fisheries were popular as a delicacy and fetched much higher prices than any other cultured species in the country.

Fish marketing at present was not satisfactory with the limited production of fish. The fishes of Nepalese production are preserved in insulated thermo boxes together with the ice. Fish transportation system is very poor due practically no equipment for receiving, cooling for distribution and sales of fish. Post-harvest losses were recorded as high as 40 percent.

Various types of fishes and fish products were found sold in the markets - wet fish preserved in iced from India and Nepal, live fishes, dried/smoked fish, ornamental fish, fish fillets, canned fish (department stores), vacuum packed fishes (trout fish) etc. Promotion of fish products is still in very infant stage in Nepal; though fish had many good attributes like cheap animal protein, health food etc. Only sign board written fresh fish available was found kept in fresh fish sale market.

CONTENTS

Page No.

List of Table

Lists of Figures and photographs

1.0 Introduction

Marketing is the management process through which goods and services move from the point of initial agricultural production until they are in the hands of ultimate consumer. It includes the coordination of four elements - development of a product, determination of its price, selection of a distribution channel to reach the customer's place, and development and implementation of a promotional strategy. Agricultural marketing has become very important in agricultural production and distribution of products through efficient and effective marketing network and it is urgent need in agriculture based national economy of Nepal. But agricultural marketing has not been able to develop in Nepal in organized manner. The farmers produced small quantities of food grains, vegetables, fruits, and other commodities and sell in the village and fulfill their basic needs. At present weight, price, quality control and others are not systematic. Agriculture marketing works in the interest of individuals which help big farmers only and large number of small farmers are always deprived of due benefits. Agriculture production and marketing both are seasonal activities in rural Nepal. Since there is lack of storage facilities, whatever the farmers grow and produce are brought to the market immediately after harvesting. This obviously causes over supply in the market compelling the farmers to sell their products at unfairly lower price.

Market centers are inadequate in number. Due to subsistence farming, the volume of marketable surplus generated by village farmers is very low. This situation discourages them from travelling to a better market wherein they could obtain a better price. As a consequence, this limits the extent or size of a rural market. At the same time, lack of proper and adequate transportation and communication system, agriculture market in Nepal are not well integrated. Because of the long open border between India and Nepal, agriculture marketing is directly influenced by price and quality of the commodity across the border. Generally, Indian agriculture production system is more efficient and their products are cheaper than the products of Nepal. This adversely affects the Nepalese agriculture market.

Agriculture marketing in Nepal is characterized by the predominance of intermediaries. Intermediaries visit door-to-door and buy products at very low price and sell the same to other consumers at higher prices. In this process they make substantial profits. Since rural farmers are not organized, they are compelled to sell their products individually and their bargaining capacity is very weak. Whatever institutions have come up recently for their protection have not been able to operate effectively due to organizational and financial difficulties. Food crops dominate the agriculture production in Nepal. Nepalese farming systems are traditional and still primitive. Land distribution in Nepal is highly skewed. There are larger numbers of small farmers. Agriculture is highly seasonal in nature, so people are not employed all the year round. There are no alternative employment opportunities in rural areas. There is thus large migration of the rural people to the urban centers and neighboring countries. Commercialization of the agriculture has been utmost priority and need of nation to increase in the volume of marketable surplus; the need for assured market outlets has become very necessary. This calls for improvement in the overall agricultural marketing system.

1.1 Fish Marketing Technology

This includes marketing information systems, category management methods, progress in supply chain management, transport and handling advances.

1.1.1 Marketing information systems

Marketing information systems help poorer groups to make smarter decisions. Flexible local networks connecting producers, traders, Non-governmental Organizations (NGOs), the public sector and consumers help them to quickly find and use the information they need. Small-scale fishers around the world are the losers of market ignorance. Middlemen and traders are the winners with high-profit margins. In general small-scale fisher's story ultimately ends with poverty.

The key activities along the value chain include harvesting, auctioning, wholesale buying and retailing. Harvesting of fish is done by persons who have control on the water body. This could be Indian contractor for harvesting or local people. There are local traders who

buy fish and sale in wholesale markets. Grading of fish is observed at different levels. It is observed after harvesting, before auctioning and before retail sale by wholesalers. After harvesting, fish is graded based on their broad variety (linked to price range) like carps and trash fishes. Usually, grading depends on quantity of fish. Carps are further graded into two sizes i.e. large and small. Carps could be also graded based on variety like separately selling the rohu (as it fetches premium price) and Chinese Carps (fetches lower price).

1.1.2 Transport and handling advances

Transportation is an interlinked activity in the value chain. The mode of transportation depends on quantity of fish and travel distance. For example cycles used by local retailers; motor bikes & autos used by traders; and utility vehicles are used for transportation to more than 100 km. Icing is the only preservation practice observed in the value chain. Cat fishes like Magur is kept as live in water tanks. Reliable temperature maintenance is the key important feature in fish and fishery product transport. Many developing countries are lacking such facilities and post-harvest losses are very high. A large portion of the harvest is discarded without marketing. In one hand, this is threat to the resources base and on the other hand it leads to poverty. This means important decisions related to storage facilities, truck design and capacity as well as supply patterns that will be required to meet food safety regulations. Maintaining the cool chain is essential to minimize product deterioration and maximum shelf life of the product.

1.1.3 Distribution and retailing

Sales of domestic fish products in modern retail outlets, such as supermarkets, are limited in developing countries compared with developed country markets. The growing urban markets represent a market opportunity for fish farmers. Poor infrastructure and logistics hinders the success of the fishery business. Moreover, post-harvest losses are as high as 40 percent in many developing country markets and this hinders the value addition process.

1.1.4 Value addition

Value addition through processing is not prevalent. This is because fresh whole fish fetches premium price in the market. At retail level, value addition through sale of cut fishes is observed. However, small fishes are processed through smoking. This is practiced for preservation than for value addition. Traditionally, smoking is practiced as a low cost preservation technique to store small trash fishes for few days. The term “Value-added” is used to characterize fish and fishery products that are converted from raw fish through processes that give the resulting product an “incremental value” in the market place. Perishable nature of fish requires special attention on handling, grading and packaging, and the market price reflects the quality of fish. Post-harvest fisheries technology involves processing, preservation, handling, harvesting, marketing etc.

1.2 Fish Marketing in Nepal

Fish farming provides many profitable opportunities; as there are more than 6000 rivers, other water bodies, fresh water resources suitable for fish farming in Nepal. Climate and nature of the soil is suitable to construct the fish ponds in different parts of Nepal. Fresh water fish farming is not expensive to produce and easy to sell in high price. Fish farms are sustainable and environment friendly. Fish are an important source of food and consumption of fish products in Nepal is increasing dramatically because fish is a healthy food, low in calories and cholesterol levels, but rich in protein. Organic farm Nepal started fish farming using the modern technology and raise fish on fresh water and ponds. Owing to insufficient quantities of fish from domestic sources and an uneven supply during the year, the catering trade, i.e. hotels and restaurants, and to a considerable extent the local population too, are supplied with imported fish, mostly from India.

S.N.	Year	Import	Export
		Fresh fish (mt)	Fresh fish (mt)
1	061/62	2547.38	1.56
2	062/63	2058.11	6.42
3	063/64	2261.23	2.86
4	064/65	2034.77	4.15
5	065/66	3469.00	134.65
6	066/67	4334.86	850
7	067/68	5370.21	
8	068/69	7424.94	

Fig 1. Import and export of fishes in Nepal.

Scientific studies show that there are great possibilities of raising fish in Nepal. With increased production of fish, fish supply to the population should be backed with a complete fish marketing system since increased production can hardly be envisaged without it. The term “marketing system” refers to reception, treatment, distribution and sales of fish.

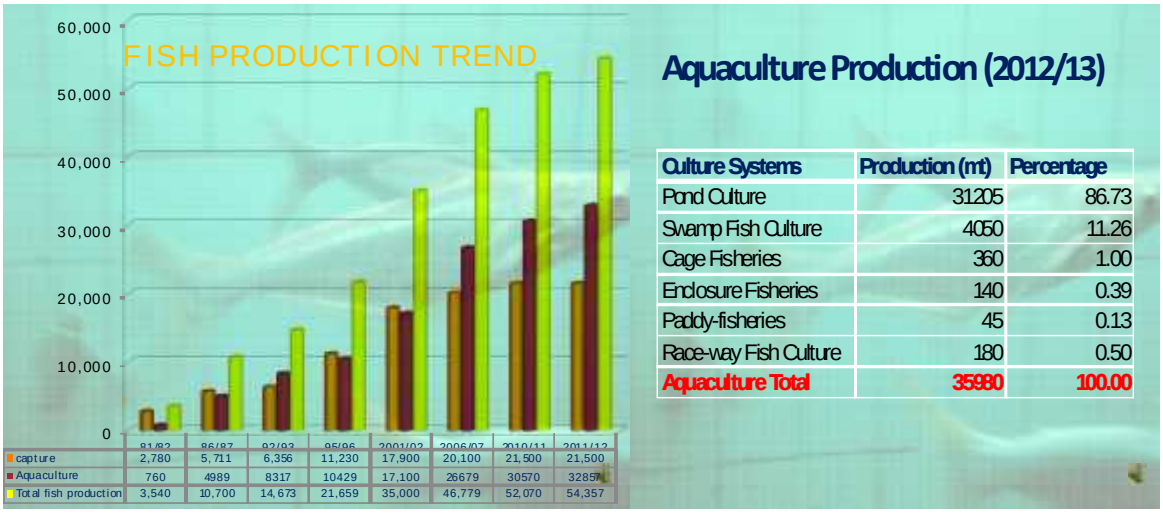


Fig 2. General trend of fish production in Nepal.

Fish marketing at present is not satisfactory with the limited production of fish. There is practically no organization in marketing or equipment for receiving, cooling, distribution and sales of fish. Everything is reduced to sales in the vicinity of the production centers

and occasional, usually weekly, consignments of fish to Kathmandu, Pokhara, Bhairawa, Narayanghat, Janakpur etc. It is transported in an insulated van, with ice at all or without ice, in large plastic containers, packed in plastic bags. The transport takes 12 to 13 hours, in ambient temperatures as high as 45°C. This kind of treatment causes rapid deterioration in quality but, fortunately, demand is high and all fish is sold within a few hours after arrival.

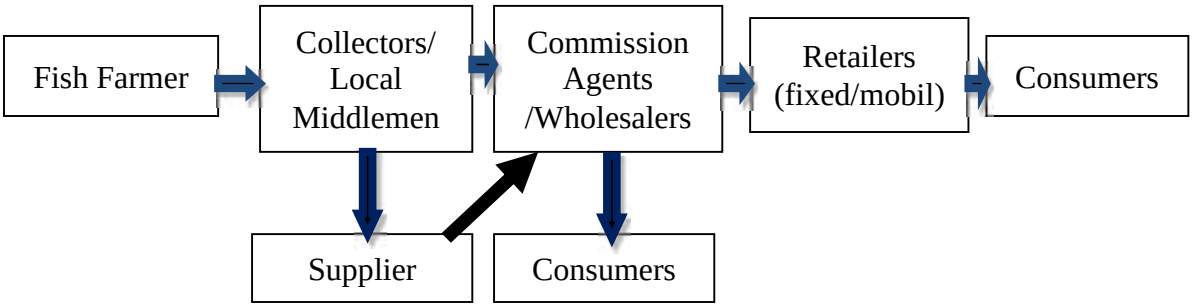
1.2.1 Present status of marketing facilities and channels

It follows that, with increasing production, the marketing situation is becoming a serious obstacle to speedy development of fisheries in Nepal. In addition, fishermen occasionally are unable to sell their catches although the demand for fish is high in the market, and this creates a feeling of insecurity. Having realized the gravity of the situation and following up the consulting mission in 1967 of Mr. H. Lisac, FAO Fishery Industry Officer, a programme for the development and advancement of fish utilization in Nepal has been worked out. Among other things, building and fitting of fish receiving/distribution centers, demonstration retail fish shops, fresh fish stalls for public market, etc. were envisaged. At the same time, FAO delivered to Nepal, as a first-aid measure to improve the situation, the insulated van for the transportation of fish, several ice machines for the manufacture of scale ice, several deep freezers, four prefabricated cool chambers, and several hundred plastic boxes. However, for various reasons, none of the suggested items have been built so far and the equipment has not been put to use, except for the occasional use of the van, several deep freezers, and an ice machine.

The concept of actual organized fish marketing was developed in 1981/1982 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. Although the consumer in Nepal prefers fresh and healthy fish, fish packed in ice and chilled fish are also commonly acceptable.

Facilities at fish markets are minimal, with poor hygiene and sanitation. There are no standard practices for handling, washing, sorting, grading, cleaning and icing of fish. The

marketing channels through which fishes have been marketed to the consumers of Nepal from producer area/producer is given below.



Source: Joshi, Ganesh Raj and Hari Babu Tiwari, 1999.

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.

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.

1.2.2 Packaging, transporting and storing

The fishes of Nepalese production sites are packed into insulated thermo boxes together with the ice. Such boxes are transported to the nearby market centers by vans, but transported to Kathmandu and other large city areas by night buses. The requirement of transport in terms of frequency and time is not easily available to the suppliers because the buses have focused their services for the passengers not for the consumption goods. The transport costs trough buses do not seem uniform and consistent to the suppliers involved in fish marketing.

The demand at present is much higher than the supply, which is particularly notable in the main consumer centre of Kathmandu where alongside the local population, an increasing

number of tourists are becoming a more and more important factor in the marketing scene, as the tourist trade in Nepal is expanding rapidly. A similar situation with regard to fish supply can be observed in other centers of Nepal such as Pokhara, Narayanghat, Hetauda, Janakpur and elsewhere.

Photograph 1. Fishes sold in the market.

1.2.3 Fisheries Cooperative Societies

Many developing countries have based their policy for small-scale fisheries development on the establishment of fishermen's cooperative societies. A cooperative is any group of people who have voluntarily agreed to cooperate, i.e., to put their resources together and to work together towards the achievement of a common economic and/or social goal in a joint, financially viable, enterprise.

A fishermen's cooperative can aim at very limited goals, such as reduction in production costs, or increase of their returns. Others may set their sights at more comprehensive objectives, like the improvement of the standard and quality of life in their communities, for which purpose they may decide to assume multiple functions. There are seven main domains in which fishermen can cooperate: (1) in the field of production (capture); (2) in the field of fish processing and storing; (3) in the field of marketing; (4) in the field of services and supply; (5) in the field of consumption and social services; (6) in the field of management of fishing grounds and quotas; and (7) in the field of credit and other financial schemes.

1.3 Objectives

The overall objective of the study was:

- To study present fish marketing status

The specific objectives were:

- To examine the fish marketing in Narayanghat and Kathmandu
- To assess the market fish price (wet, dry and live fishes)
- To assess characteristics of the fish market at the end consumer level in terms of variety, quality, pricing, purchase behavior
- To identify gaps in different fish marketing channels
- To derive marketing strategy for the overall project to improve livelihood of stakeholders.

2.0 Literature Review

Marketing is the management process of the production chain from producer to final consumer (Kotler, 2000). Marketing identifies, predicts and meets consumer demand with a profit for the company or organization (Chartered Institute of Marketing, 2009). Marketing is also defined as socio-economic activities that control the flow of ideas, goods or services chain from producer to consumers or users (Hillstrom and Hillstrom, 2002). Marketing also plans and designs the principles of pricing, promotion and distribution of goods, ideas and services in order to satisfy needs and wants of individuals and organizations (Carter, 1997).

Logistics is the science of planning and implementing the framework for the management of material, service, information and capital flows (Ghiani et al. 2004). Logistics also includes storage, transportation, and design of the supply chain. Transportation is a one of the key elements of logistics (Tseng et al., 2005), since it is important to meet the requirements of the customers in a timely manner (Hong Zhao et al., 2010).

Physical facilities and infrastructure in all types of fish markets are far from satisfactory (FAO, 2001). Some of the problems in fish marketing include high perish ability and bulkiness of material, high heterogeneity in size and weight among species, high cost of storage and transportation, no guarantee of quality and quantity of commodity, low demand elasticity and high price spread (Ravindranath, 2008). Gupta (1984) and Srivastava (1985) had studied the marketing of fish and fishery products in India, wherein they had analyzed price variations among species across states and had identified infrastructural bottlenecks in efficient marketing system. Rao (1983) had emphasized that an efficient fish marketing system could eliminate some of the depressed pockets of malnutrition by supplying fish at reasonable prices to people living on subsistence level.
In general, traditional methods of fish processing (dry fish), and poor quality of products hinders the ways to enter into export market (Shamsuddoha, 2007). Traditional processors are out of export market as they could not meet the Sanitary and Phyto-Sanitary measures and implications of Technical Barriers to Trade (TBT) (Shamsuddoha, 2007). Poor maintenance of quality standards hinders the progress of Vietnam Seafood Industry. Sun drying of fishes is a simple and the oldest known method of fish preservation where

fishes are dried under the sun. Drying method is considered as the least expensive method of fish preservation (Balachandran, 2001). In Bangladesh, traditional drying is often rudimentary and good hygiene is rarely practiced (Azam, 2002).

Value chains are networks of labour and production processes where the result is a finished commodity (Hopkins and Wallerstein, 1986). Value chains are led by firm leaders and chains consist of several nodes, each of which has a particular function in transforming an object from raw materials to an article of consumption (Gereffi and Korzeniewicz, 1994).

Marketing cost, the expenses incurred in performing different marketing functions by the traders and the selling price of the product determine the level of the net marketing margin of the trader. Long marketing channel are one of the reasons for increased marketing cost and bring inefficiency in marketing which results the loss in the consumers' welfare and producers' share (Haque and Hassian et al., 1996). 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 (Lofvall, 1998). The fish producer and farmers and fish traders are the main actors of fish marketing system (Shah, 2005). The appropriate marketing infrastructure and profitability encourage the marketing agents for efficient flow of goods from the production sites to the market centers (Joshi and Tiwari, 1999). Non- native fish are introduced around the world mainly for improving fisheries, sports, ornamental fish trade and bio-control of the mosquito (Bijukumar, 2000). The aquarium trade has not come under the scanner of environmentalist, conservationists, ecologists, and policy makers as much as trade in terrestrial endangered species (Naylor et al.2001; Chapman *et* al.2003; Padilla and Williams 2004). An extensive study on aquarium fishes had been done in context to Nepal specially related to Kathmandu, (Amatya and Gurung, 2005). Studies on the Resource, Biology and Ecology of fresh water of Kathmandu Valley with particular reference to fish production management, Market and Conservation had been done by Shrestha (1979). Some studies on different aspects of fish markets, different types of fishes sold in village markets and Kathmandu markets had been described by Shrestha (1994) in “Fishes, fishing implements and methods of Nepal”. Shrestha (2012) is working on the breeding project of Guppy, Sword Tail, Platy, Gold Fish, Color Carp.

3.0 Materials and Methods

3.1 Study area

The present study was done to find out the status of fish market in Kathmandu valley and Narayanghat. Still major study was focused on fish market of Kathmandu valley. For that, weekly visits were made up to two months at initial period followed by frequent visits later in different fish shops at Kathmandu, Kalimati, Ason, new and old Baneshwar, Chabahil, Balkhu, Machhapokhari, Bhaktapur and Lalitpur etc. to collect information.

3.2. Secondary Data Collection:

From appropriate government and non-government organizations such as Directorate of Fisheries (DoFD) and literatures, secondary data about fish distribution and marketing information were gathered.

3.3. Primary 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.

3.4. Questionnaire Interviews:

20 fish traders 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 center, traders were interviewed through a formal conversation for this purpose. Information about fish marketing, pricing policy, trading actions, constrains of fish marketing and socio-economic conditions of traders are the consequences of the interviews

4.0 Results

4.1 Fish markets

In Chitwan and Katmandu, there were different types of fish markets recorded.

4.1.1 Fishes in Chitwan

In Chitwan, fish traders could be grouped into 3 categories suppliers, wholesalers and retailers. The large volume (61%) of fish sold in Chitwan was produced in this place and certain volume of fish was imported from India (39%). Rohu (*Labeo*) (74%) was the major Indian fish marketed followed by Bachuwa (*Pangasius*), Naini (*Cirhinus mrigala*) and African catfish/magur (*Clarias gariepinus*). The marketing price of local Naini was higher than other local species of fish in the Chitwan.

Indian Fishes were mostly packed in thermo cool box with more minutely crushed ice and transported by truck while Nepalese fish were mostly packed in bamboo basket and transported by bus. Indian fishes were bigger sizes than the Nepalese fish. Nepalese fishes were found fresh and good quality than Indian fishes. Indian fish traders were well established and organized than Nepalese traders.

The fish consumers in Chitwan were influenced by the price, quality and size of the fish while purchasing fish. Majority of the consumer said that the cost of fish in Chitwan was moderate and need more improvement in the fish market of the Chitwan. Lack of appropriate market facilities, weak competitiveness, lack of specialized vehicles for fish transport were some of the key problem in fish marketing.

The study indicated that there is great potential to substitute the imported volume through commercial production, post harvest management and improving efficiency of fish marketing system with in Nepal.

Table 1. Live fish outlet in Chitwan

	Narayanghat	Bharatpur	Tadi
Live fish selling Counter	2	2	1
Daily fish sell (kg/day)	200-400	150-350	50-150

Table 2. Important Fish markets and daily fresh fish selling scenario in Chitwan

Fish market place	Estimated fish sell kg/day	Remarks
Narayanghat (Gorkha, Lamajung, Tanahu, Pokhara, Baglung supply)	1000-1500	Local production is • sufficient (80-90 %) during October-February And • scarce (40-60 %) during March to September
Bharatpur (Malekhu supply)	400-500	
Tadi Muglin	300-400 200-300	
Parsa Madhi area	300-400 200-300	
Bhandara Rampur/Saradanagar	50-100 200-300	
Door-to door fish sellers 50; (daily sales; 10-15 kg/day)	500-750	
Total	3550-4500	

Table 3. Fresh Fish price in Chitwan

Products	Farm-gate price (Rs/kg)	Consumer price (Rs/kg)
Pond culture	240	300-320
Carps <200gm	180	220-240
Carps < 500gm	200	275-300
Carps 500gm or bigger	240	300 -320
Live Fish	-	450 -600
Indian fish (> 1 kg)	200-225 (wholesale rate)	275-300

Besides fresh/wet fishes, there are different types of fishes available in the market.

- Iced fish from India and Nepal
- Dried/Smoked Fish
- Ornamental fish
- Canned fish (department stores)

4.1.2 Fishes in Kathmandu

In Kathmandu market, fish produced from Terai and Indian farms in Andhra Pradesh were supplied at present. National fish product comprised only 13% and imported fishes from India was dominant comprising 87% in Kathmandu Fish market. Fish traders, dealers, retailers were not organized in our country. The channel through which fish had been marketed to the consumers from the production areas were Import Fish Producers, Collector/local middlemen, Wholesalers, Consumers, Retailers etc.

Table 4. Important Fish markets and daily fresh fish selling scenario in Kathmandu.

S.N.	Fish Species	Whole Sale Price (kg)	Retail Price	Total quantity sold daily (kg)
1.	Rohu (*Labeo rohita*)	205-220	250-270	2000-25000
2.	Bachuwa (*Pangasius sutchi*)	160-170	200-220	1000
3.	Buhari (*Wallago attu*)	420-450	450-480	1000
4.	Chhari (*Chanda nana*)	180-200	220-250	300-400
5.	Sahar (*Tor putitora*)	750	800-850	100-200
6.	Pomfred (*Brama brama*)	600	650-700	100-150
7.	Prawn (*Palaemon cerratus*)	400-1100	550-1300	50-100
8.	Catla (*Catla catla*)	260	280-300	500
9.	Live Magur (*Clarias gariepinus*)	200	240-280	200-300
10.	Chuche Bam (*Amphipnous cuchia*)	600	650-700	100-155
11.	Bam (*Anguilla bengalensis*)	400	425-450	125-150
12.	Kati (*Mystus senghala*)	400	425-460	50-105
13.	Common carp (*Cyprinus carpio*)	280	300-325	70-115
14.	Silver Carp (*Hypophthalmichthys molitrix*)	240-250	270-300	150-200
15.	Big head (*Aristichthys nobilis*)	320	350-450	usually not available
16.	Hilsa (*Hilsa ilsa*)	1200	1250-1300	usually not available
17.	Jalkapoor (*Clepisoma gaura*)	500	550-600	100-150
18.	Grass Carp (*Ctenopharyngodon idella*)	300	325-360	100-160
19.	Baghi (*Botia lohachata chaudhuri)*	400	430-460	50-100
20.	Garai (*Channa striatus*)	220	250-260	150 -210

4.1.3 Marketing of fishes (live fishes)

Live fishes from Bara and Chitwan district were available in Kathmandu at different places like Balkhu, Ratopil, Bhaktapur and new Baneshwor for sale. Live fish sale accounted around 10%. The Kathmadu valley had more than 38 outlets selling live fishes. Prices of live fishes fetched high due to difficult to keep alive. Prices of different fishes in the markets like *Catla catla* (Bhakur) ranged at about Rs.600/kg and fishes like *Rohu*, *Ctenopharyngodon idella* (Grass corp), *Cyprinus carpio* (Common crap) ranges about Rs. 450/kg. According to President of Fishery Association of Nepal, 800 – 1000 kg of live fish were sold from Balkhu Vegetable Market. Four water tanks had been set up in this market to house live fishes. Except Saturday approximately 40-50 kg per day fishes were sold out whereas on Saturdays 100 kg fishes were sold.

Photograph 2. Live fishes sold in Kathmandu.

4.1.4 Rainbow trout (*Oncorhynchus mykiss*)

Vacuum packed rainbow trout fishes were sold in whole sale market at Balaju Chowk. Trout fishes were cultured in Nuwakot district. The weight of fishes were approximately 250 -350 g. Fishes were vacuum packed and were preserved at 20^0 C. 6-7 fishes were packed in a packet. The price of fish was 1100 per kg. In an average 25-26 kg/day were supplied to different hotels for 8-9 months of a year. Live rainbow trout were sold in different places on the way from Balaju Chowk to Kakni. Rainbow trout live five fishes

were stocked in cement tank where running river water was continuously supplied and out drained from the tank. The price of fish varied from 900-1000/kg.

4.1.5 Fish in CN House

It was situated in front of supreme high court in Ram Shah Path, Kathmandu. It occupied an area of about 32 ropani owned by government of Nepal (Nepal Food Cooperation). It was run by a group of Chinese team. Only three species of fishes were cultured like common carp, grass carp and silver carp in six ponds and fingerlings were brought from Hetauda and Chitwan. These fishes were fed vegetables peels, cow dung, mustard cake etc. The fishes were supplied generally to projects, Chinese restaurants and Chinese Embassy. The price of all carps was Rs. 500-600/kg. The price was relatively higher because they were sold alive and fed organic matter food only.

4.1.6 Marketing of canned fish and Pickle fish in Bhatbhateni Supermarket

Tunna fish and fish pickles of different brands were sold in supermarkets of Kathmandu. Tunna fish were mostly consumed by tourist season in September to December months as fast food during tracking. Only 300 packets were consumed in a month in off season but during tracking season demand of it increased. The price of tunna fish was different and depended upon its flavor.

- Price of Sardine tomato sauce - Rs. 140 for 132 gm.
- Deli Hot Tunna - Rs. 229 for 85 gm.
- Packet of combined salmon spread and crackers Rs. 163 for 110gm.

Pickle of dry fish of prawn and other dry fish with peanut were sold in supermarket. Nepalese customers consumed it as snacks. Different Brands of fishes were found in market.

- Shree Maa Annapurna Traders produced prawn pickles with peanuts chilli, garlic of price Rs. 202 for 300 gm.

- Shree Aliza Easy Traders link Chabahil sold prawn with peanut at Rs. 84 for 100gm and only for prawn at Rs. 67 for 100 gm.

Thailand Brand TUNNA Canned fish

Pickle of Dry Fish

Photograph 3. Canned fish and fish pickles.

4.1.7 Dry fish markets and sources of dry fishes

There is no specific dry fish market had developed in Narayanghat, other than Malekhu and Mugling Bazaar. But dry fish market was in Ason, Maru Tole, Kalimati, Rajshahi city. There were many travelling vendors in the city who sell dry fishes directly carrying fishes on bicycle or in hand.

4.1.7.1 Dried indigenous fish species kept in the Malekhu market

Dried indigenous fish species in Nepal were kept in the market for selling in background of Malekhu Bazzar which was attached with highway. Trishuli River which was the rich source of indigenous fish species. Excess of fish was sundried and kept in the market for selling. Fish species used for drying were Nakata (*Garra gotyla*), Buduna (*Garra annandalei*), Kabre (*Glyptothorax sps*), Sahar (*Tor putitora*), Faketa (*Barilius sps*), Sidra (*Puntius sps*).

Photograph 4. Dry fishes

4.1.7.2 Demand of dry fishes in Kathmandu

The people of Kathmandu city preferred fresh fish as well as dry fish. Local newari people of Kathmandu were frequently using smoke fishes as token of auspicious item and offered during birth day, marriage, bhai tika etc. So, demand of smoke fishes was very high during Dashain, Tihar and throughout winter (marriage season). Besides, sundried fishes were also used to prepare different typical item like 'Sanya Kunya' in winter and pickles. In Narayanghat, especially Malekhu and Mugling were famous for smoke dried chadi fishes of local rivers and locally prepared fillets to be taken mixed with vegetables.

Photograph 5. Dried fish sold in Kathmandu

4.1.8 Aquarium Ornamental Fish Market

The survey showed that the ornamental fish demand was growing annually in the country, especially in Kathmandu valley. The main markets of ornamental fishes were Kathmandu, Lalitpur and Bhaktapur. In Kirtipur area, shops of aquarium fishes were not found in the working condition. There were about 28-30 shops in Kathmandu valley which dealt with aquarium fishes, aquarium tanks, fish feed, aquatic plants and various equipments necessary for aquarium. Businessmen regarding this sector earned above 25 thousand monthly. The business of ornamental fishes was flourishing year by year and new shops were opening annually in different places.

Fish prices were ranged from Rs 60 to 975. Red sword tail, Panapal sword tail and Wack sword tail of small size was Rs.60/pair, whereas Ray kin gold was Rs.975/pair. Small size Silver shark was Rs.160 and large size ranged to Rs.3500. The demand was variable but high demand for small size fishes was recorded in most houses with price of fishes ranging from Rs.60-120.

Table 5. Fishes prices at Kathmandu

(Price in NRs/2pc.).

S.N.	Name of Fish	Small size	Medium Size	Large Size
1.	Red oranda	120	190	275
2.	Red cap oranda	120	190	275
3.	Black oranda	120	190	275
4.	Ray Kin gold	975	1400	2600
5.	Black mor gold	120	190	275
6.	Calico gold	120	160	270
7.	Subun kin gold	120	225	375
8.	Lion head	160	275	475
9.	Pearl scale	120	190	275
10.	Bubble eyes	160	225	375
11.	White gold	90	160	275
12.	Milky carp	225	275	375
13.	Silver shark	160	275	3500
14.	Red tail shark	120	190	275
15.	Rainbow shark	175	275	375
16.	Tiger shark	120	275	375
17.	White shark	190	275	375
18.	Red sword tail	60	90	275
19.	Panapal “	60	90	275

20.	Wack "	60	90	275
21.	Black moon tail (Platy)	30	90	190
22.	Black weadow tetra	60	190	275
23.	Serpa tetra	60	190	275
24.	Rosy barb	60	90	190
25.	Tiger barb	90	190	275
26.	Balloon molly	60	90	190
27.	Angel fish	120	175	275
28.	Oscar	175	275	375
29.	Parrot fish	190	1400	3500
30.	Juwel fish	950	1400	3500
31.	Arowana	950	1400	3500
32.	Dollar fish	90	175	275
33.	Knife fish	90	175	275
34.	Tinfoil barb	90	175	275
35.	Flower horn	950	6500	15000
36.	Green terror	375	1200	2200
37.	Texax	90	175	275
38.	Piranha	90	175	275
39.	Gourami	90	160	275

Source: Local Survey. 2070

4.2 Fishes used in Five Star Hotel in Kathmandu

In Yak and Yeti Hotel, fishes were mostly consumed in the month of September, October, November, May and June. These days, boneless fishes like white fish (450-500 per kg) from Thailand and Vasa from Indian were also used. These fishes were preserved at the temperature of 8-18^0 C. Fishes items were prepared for snacks, fish curry, crump fry fish, pakouda, Chinese continent food and more than 60% of them were consumed as fish curry. Different species of fishes were used for consumer cuisine are:

Table 6. Fishes used in Yak and Yeti Hotel.

Name of Fishes	Name of place	Price/kg	Amount (Kg) Consumed (Month)
Jalkapoor	Local	350	200-300
Salmon	Norway	3000	10-20
Rainbow trout	Kakani/Sindupalchowk	1000-1200	10-20
Rohu	Local market	250-300	100-200

In Soaltee hotel (Five star) situated at Soaltee mode different types of fishes were consumed.

Table 7. Fishes used in Soaltee Hotel.

Name of fishes	Price /kg	Amount (Kg) Consumed (Month)
Rainbow trout (local)	1400	10
Prawn	1100-1900	30-35
Fresh Pamphlet (fish packet from Delhi, Calcutta)	1550	8-9
Basa (Thailand, India)	600	20-25

4.3 Fish Marketing System and Marketing Channel in Nepal

Marketing cost, the expenses incurred in performing different marketing functions by the traders and the selling price of the product determined the level of the net marketing margin of the trader. Fish marketing system referred to reception, treatment, distribution and sales of fish, i.e. a whole series of operations which indeed increased the price of fish but were essential if fresh and high quality fish food was to reach the homes of millions of consumers all over the country (Lisac, 1997). In Nepal market, Fish traders at all levels from producers to collector to suppliers and wholesalers to retailers and vendors had developed and operated through organized marketing networks. There were two groups of fish traders involved in fish marketing of Nepal; the Indian trader and those from Nepal. The lower price of fish had been disincentive for most farmers.

4.3.1 Marketing channel of dry fishes

Marketing channels of dried fishes consisted dry fish processor, several middlemen and consumers. In the study areas, five types of marketing chains were identified. The most simple channel (channel I) was composed of dry fish processors and consumers only where dry fish processors sold their products directly to the consumers, which is usually done at the fish drying spots or local markets. In another chain (channel II), dry fish producers sold their products to the retailers whose in turn sold to the consumers.

Sometimes local assemblers procured the dried fish from the drying spots and brought the product to the commission agents in the city markets, and retailers (including traveling

vendors) of the urban areas collect dried fish from commission agents and sold to the consumers (Channel III). In another channel (Channel IV), dry fish processors brought their products to the commission agents of city markets and from there, consumers purchased the dried fish via retailers. The last chain (Channel V) was composed of three middlemen; commission agents of local areas (adjacent to drying spots) gathered the dried fishes and transported to the commission agents of city wholesale markets.

4.3.2 Fish Preservation through smoking and sun-drying in Nepal

Sometime fishermen captured fish in quantities beyond what could be marketed in fresh form. In order to preserve extra fish from spoilage, smoking and sun-drying were the methods practiced. Fishermen used to smoke fish in the fishing spot. Generally, such methods of preservation applied to high value and big fishes such as *Bagarius yarrelli, Tor putitora, Neolissocheilus hexagonolepis, Chagunius chagunio.* It worth mentioning the dried fish represented about 25% of total fish sale. The price of dry fishes was 4-5 times higher for dried smoked fish.

Photograph 5. Fish drying

More than 70% of dry fishes were imported from India. The sun dried fishes were mostly imported from neighboring countries.

4.3.3 Packaging, transportation and storage facilities of fish in Nepal

Fish harvested at the production site in Nepal were cleaned with fresh water and packed into a locally made bamboo/cane baskets with alternate layers of crushed ice. The packed products were transported to the nearby market centers by human labor and bicycles/rickshaws. These were commonly transported to distant cities by night buses and seldom travel by trucks or others means of transport (Joshi and Tiwari, 1999). While the bus service gave less priority to fish transportation despite being highly perishable commodity. On the other hand the prices charged by bus services for fish transportation was more on ad-hoc basis and inconsistent.

The indigenous craps arriving from India especially from Andhra Pradesh were packed in ice immediately after harvest at the pond (Lofvall, 1998). The fish was taken to a packing centre for washing and packed in plastic boxes with alternate layers of crushed ice in between layers of fish at a ratio of 50% ice and 50% fish. The boxes were loaded onto a truck insulated appropriately with rice husk both at the bottom, the sides and on the top of the load. The cargo trucks used in fish transportation were ordinary cargo trucks not insulated vehicles. The fish cargo trucks from Andhra Pradesh travel about 6/7 days before it arrived at Kathmandu or other urban destination of Nepal. The fish was delivered to the buyer (wholesalers) immediately. The non-delivered stock either remained on the truck, acting as storage or was kept tin a non insulated store room for further distribution. Ice is added as necessary until the stock was sold out completely. The packing material used for fish fillets were normally plastic or a combination of paper and plastics. These packing materials were of varying quality and durability.

4.3.4 Determination of Price of Fish in Nepal

Price of fish might vary due to a variety of factors such as season, location of sales, size and species of fish and inflow of fish from India (Adhikari, 1993). The fish imported from India and fish produced in Nepal was traded in the fish market of Nepal. The fish from India was more consistent in size and supply, whereas the fish from Nepal was smaller in size. These were some of the factors which determined the fish prices in the

market. Naturally, prices of fish also depended on quality and size, with large fish attracting higher price (Lofvall,1998). A number of freshwater indigenous fish species of economic value Asla (*Schizothorax* spp.), Sahar (*Tor* spp.), Katle (*Neolissocheilus hexagonolepis*) and Bam (*Anguilla* spp.) from capture fisheries were popular as a delicacy and fetched much higher prices than any other cultured species in the country. Nepalese fish fetched higher prices than Indian fish in term of freshness (Lofvall, 1998). The general perception was that the Indian fish having been packed in ice for several days and the quality was inferior. Fish wais highly considered as protein rich commodity.

Table 8. Whole sale and retail price of dry fishes in Balkhu and Ason.

Local name of dry fishes	Whole sale price in Kg. (Balkhu)	Retail Price in kg (Ason)
Mahili(sidhara)	320	700
Madali	150	500
Nathali	350	700
Prawn	350	700
Bam	280	500
Bhusi	150	500
Kechki	450	750
Khaira	120	500
Silver	140	500

4.4 Fish Marketing Problem in Nepal

The fish production activities exhibited a very positive growth in the country. However, the overall productivity had not been satisfactory in terms of marketing management and its institutional capability. Lack of marketing infrastructure and facilities caused slow pace of transformation in agricultural production system. Access to market was expensive due to lack of infrastructure like transportation that caused inaccessibility of locally produced commodity to domestic market. The major marketing problems in fishery sectors were lack of all weather roads connecting fish producing areas with assembly markets and consumption centers, absence of cold storage facilities/chilling rooms for holding the harvest and regulate supply, absence of insulated vehicles to prevent spoilage during sales (Adhikari, 1993). The most serious marketing difficulties seemed to occur in

remote communities, which lack transport, ice, poor road facilities, fish diseases, lack of financial facilities, frequent strikes, fish theft, pond poisoning.

Lack of research about fish marketing, unhygienic storing conditions, lack of specialized fish marketing manpower and lack of adequate marketing infrastructure were the problem led to insufficiently and incompetent marketing of fish in Nepal (Joshi and Tiwari, 1999).

5.0 Discussion

Marketing is the management process of the production chain from producer to final consumer (Kotler, 2000). It included the coordination of four elements development of a product, determination of its price, selection of a distribution channel to reach the customer's place, and development and implementation of a promotional strategy.

5.1 Development of a product

Fish was an important source of food and consumption of fish products in Nepal was increasing dramatically. Nepalese fishes were found fresh and good quality than Indian fishes. So, there was great potential to substitute the imported volume through commercial production, post harvest management and improving efficiency of fish marketing system with in Nepal. There should be promotion of organic fish farming in Nepal and selling of live fish in market as they fetch better price with customers' satisfaction. As marketing identified, predicted and met consumer demand with a profit for the company or organization (Chartered Institute of Marketing, 2009) and marketing was the flow of goods and services in order to satisfy needs and wants of individuals (Carter, 1997).

5.2 Determination of its price

Physical facilities and infrastructure in all types of fish markets were far from satisfactory (FAO, 2001). Logistics planning and management of material, service, information and capital flows were determinant factor for commodity pricing (Ghiani et al. 2004). Some of the problems in fish marketing include high perishability and bulkiness of material, high heterogeneity in size and weight among species, high cost of storage and transportation, no guarantee of quality and quantity of commodity, low demand elasticity and high price spread (Ravindranath, 2008). Gupta (1984) and Srivastava (1985) had

studied the marketing of fish and fishery products in India, wherein they had analyzed price variations among species across states and had identified infrastructural bottlenecks in efficient marketing system. Rao (1983) had emphasized that an efficient fish marketing system could eliminate some of the depressed pockets of malnutrition by supplying fish at reasonable prices to people living on subsistence level.

In general, traditional methods of fish processing (dry fish), and poor quality of products hindered the ways to enter into export market (Shamsuddoha, 2007). Sun drying of fishes was a simple and the oldest known method of fish preservation. Drying method was considered as the least expensive method of fish preservation (Balachandran, 2001). In Bangladesh, traditional drying is often rudimentary and good hygiene was rarely practiced (Azam, 2002). Traditional processors were out of export market as they could not meet the Sanitary and Phyto-Sanitary measures and implications of Technical Barriers to Trade (TBT) (Shamsuddoha, 2007). The policy for improved fish processing, fillet production, vacuum packing for high valued fishes like Rainbow trout etc should developed to attract high economic group local customers and for export.

Aquarium fish are mostly exotic types and price was very high due to transportation cost, custom duty and profit margin of traders. Non- native fish were introduced around the world mainly for improving fisheries, sports, ornamental fish trade and bio-control of the mosquito (Bijukumar, 2000). The aquarium trade had not come under the scanner of environmentalist, conservationists, ecologists, and policy makers as much as trade in terrestrial endangered species (Naylor et al.2001; Chapman *et* al.2003; Padilla and Williams 2004). So, attention should be focused on the promotion of local ornamental fishes to substitute aquarium fish import and earn foreign currency by export.

5.3 Selection of a distribution channel to reach the customer's place

Fish traders, dealers, retailers were not organized in our country. The channel through which fish had been marketed to the consumers from the production areas were Import Fish Producers, Collector/local middlemen, Wholesalers, Consumers, Retailers etc.

Value chains were networks of labour and production processes where the result was a finished commodity (Hopkins and Wallerstein, 1986). Value chains were led by firm leaders and chains consisted of several nodes, each of which had a particular function in transforming an object from raw materials to an article of consumption (Gereffi and Korzeniewicz, 1994). Long marketing channel were one of the reasons for increased marketing cost and bring inefficiency in marketing which resulted the loss in the consumers' welfare and producers' share (Haque and Hassian et al., 1996). 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 (Lofvall, 1998). The appropriate marketing infrastructure and profitability encouraged the marketing agents for efficient flow of goods from the production sites to the market centers (Joshi and Tiwari, 1999). Attempt should make to decrease the value chain channels as far as possible to deliver major share of gain to fish farmers.

5.4 Development and implementation of a promotional strategy

Promotion of fish products is still in very infant stage in Nepal; though fish had many good attributes like cheap animal protein, health food etc. Only sign board written fresh fish available was found kept in fresh fish sale market and fish harvested were cleaned with fresh water and packed into a locally made bamboo/cane baskets with alternate layers of crushed ice. The government, cooperatives, media, health workers etc. should very careful in the promotional strategy of fish value chains.

6.0 Conclusion & Recommendations

Conclusion

Marketing is the coordination of four elements - development of a product, determination of its price, selection of a distribution channel to reach the customer's place, development and implementation of a promotional strategy. In general fishes are harvested in small-scale both from capture/culture and fisher's sales fishes in the vicinity of the production centers. Small-scale fishers are the losers of market ignorance. Middlemen and traders are the winners with high-profit margins. There existed strong competition between wet fishes of Nepal with Indian products. The fish from India was more consistent in size and supply, whereas the fish from Nepal was smaller in size but considered good quality and taste. A number of freshwater indigenous fish species of economic value Asla (*Schizothorax* spp.), Sahar (*Tor* spp.), Katle (*Neolissocheilus hexagonolepis*) and Bam (*Anguilla* spp.) from capture fisheries were popular as a delicacy and fetched much higher prices than any other cultured species in the country.

Fish marketing at present is not satisfactory with the limited production of fish. The fishes of Nepalese production sites are packed into insulated thermo boxes together with the ice. Such boxes are transported to the nearby market centers by vans and transported to Kathmandu and other large city areas by night buses. The transport takes 12 to 13 hours, in ambient temperatures as high as 45°C. This kind of treatment causes rapid deterioration in quality. There is practically no equipment for receiving, cooling, distribution and sales of fish. Post-harvest losses are as high as 40 percent.

Various types of fishes and fish products were found sold in the markets - wet fish preserved in iced from India and Nepal, live fishes, dried/smoked fish, ornamental fish, fish fillets, canned fish (department stores), vacuum packed fishes (trout fish) etc. Fish marketing has become very important in production and distribution of products.

Promotion of fish products is still in very infant stage in Nepal; though fish had many good attributes like cheap animal protein, health food etc. Only sign board written fresh fish available was found kept in fresh fish sale market. The government, cooperatives, media, health workers etc. should very careful in the promotional strategy of fish value chains.

Recommendations

- The import fish from India needs to be substituted by enhancing the production by means of extensive production and marketing support services.
- The transportation storage and packaging system of fish should be improved, to reduce wastage and losses, to improve the quality of product and to lower the marketing costs.
- The fish producers and traders should be acquainted about the production costs, marketing structures, margins and profitability at domestic and export markets.
- The potentiality of exporting to India boarder town should be explored and necessary support services to the exporters should be provided.
- The management capability of Nepalese fish entrepreneur's needs to be improved in the areas of handling, transporting, storing, packaging and storing, etc.
- Roads should be constructed at the rural fish production pockets that the products of such pockets may be supplied effectively at the major towns.
- Due attention should be paid for developing specialized manpower in the field of fish marketing and post harvest handling.
- Over time, more detailed handling, hygiene and quality standards and regulations should be developed in accordance with international practices and these should be properly enforced. The food laboratory should develop in collaboration with competent authorities.
- The fish market and the storage facilities shave to be kept clean and strict routines for, for example, hosing the premises, waste collection etc. have to be established.
- The use of crushed, clean ice should be promoted with the establishment of the ice plant to ensure adequate supply of ice.
- Frozen fishery products should inspected and only properly packed products in good condition in the cold store.

7.0 References

Amatya, B. and Gurung. 2005. A hand book of Aquarium and Aquarium Fishes: with reference to Nepal. Swani Offset Press, Naya Bazar, Pokhara.pp:128

Azam, K. 2002. Fishermen Community of Kuakata, Bangladesh: Fisheries Activities and Quality of Dried Fish, SUFER Project (DFID-UGC), Khulna University, p. 2.

Balachandran, K. K. 2001. Post-harvest Technology of Fish and Fish Products, Daya Publishing House, Delhi-110035, p. 77.

Kumar Biju, A. 2000. Exotic fishes and freshwater fish diversity. *Zoos' Print Journal* 15(11): 363-367.

Carter, S. 1997: *Global Agricultural Marketing Management (Marketing and Agribusiness texts - 3)*. FAO. Rome

Chapman, F.A, S.A Fitz- Coy, E.M, Thuberg, and C.M. Adams. 2003. United States of America Trade In Ornamental Fish. Journal of the World Aquaculture 28: p. 1-10.

Chartered Institute of Marketing: 2009: *Marketing and the 7 Ps: A brief summary of marketing and how it works*.

DoFD, 2002. Country profile – Nepal, 2059/2060. Fisheries sub-sector, Ministry of Agriculture and Cooperative, Department of Agriculture, Kathmandu, Nepal.

FAO (2001) Production, Accessibility, Marketing and Consumption Patterns of Freshwater Aquaculture Products in Asia: A Cross-Country Comparison (available online).

Gereffi, Gary and Korzeniewicz, Miguel. 1994. Commodity chains and global capitalism. Praeger Publishers, 88 Post Road West, Westport, CT 06881. An Imprint of Greenwood Publishing Group, Inc, USA.

Ghiani, G., Laporte, G. and Musmanno, R. 2004: *Introduction to Logistics Systems Planning and Control*. JohnWiley & Sons, Ltd

Gupta, V.K. (1984) Marine Fish Marketing in India (Volume I – Summary and Conclusions). IIM Ahmedabad & Concept Publishing Company, New Delhi.

Haque, M. A, M. A. M. Mian, M.A. Baset and Hassian M.S. 1996. Economic Affairs.Vol 41, Qr 4, December 1996. Publisher, Sri R. C. Bose, 1996. Original from University of Virginia Digitized28 Sep 2009

Hillstrom, K. and Hillstrom, C. 2002: Marketing (Encyclopedia of Small Business). Gale Gengage Volume 2.

Hong Zhao, Q., Chen, Sh., Leung, S. and Lai, K. 2010: Integration of inventory and transportation decisions in a logistics system. *Transportation Research Part E* Volume 46 pp: 913–925.

Hopkins, Terence K., and Wallerstein, Immanuel.1986. Commodity chain in the world economy prior to 1800. Review 10, 1:157 – 70.

Joshi, G.R. and H.B. Tiwari. 1999. Present fish marketing system potentially and improvement. In: Swar, D.B., Pradhan, G.B.N. & bisgard, J. (Eds.) 1999.

Kotler, 2000. Marketing Management Millennium Edition, Tenth Edition. Prentice-Hall, Inc. USA.

Lofvall, L.W. 1998 Fish marketing in Kathmandu Valley. Report prepared for Government of Nepal by the Food and Agriculture Organization of The United Nations, FAO, Kathmandu, Nepal.

Naylor, R.L., S.L. Williams & D.R. Strong. 2001. Aquaculture – a gateway for exotic species. *Science* 294: 1655-1656.

Padilla D. K, Williams, S. L. 2004. Beyond ballast water: aquarium and ornamental trades as sources of invasive species in aquatic ecosystems. Frontiers in Ecology and the Environment 2: 131–138.

Rao, P.S. 1983 Fishery Economics and Management in India. Pioneer Publishers and Distributors, Mumbai, pp. 197-217.

Ravindranath, K. 2008 in National Workshop on Development of Strategies for Domestic Marketing of Fish and Fishery Products, College of Fisheries Sah, S. P. 2006.

Fish production and marketing system in Dhanusha district of Nepal. M.Sc. Thesis, Department of Fisheries and Aquaculture, IAAS, Rampur, Chitwan, Nepal, pp 88.

Shamsuddoha, M. 2007. Supply and Value Chain Analysis in the marketing of marine dried fishes in Bangladesh and Non Tariff Measures (NTMs) in International Trading. Paper/poster prepared for presentation in 106th seminars of the EAAE 25-27 October, 2007, Montpellier, France.

Shrestha, J., 1994. Fishes, Fishing Implements and Method of Nepal. Published by Smt. M. D. Gupta, Lalitpur Colony, Lashkar (Gwalior), India.

Shrestha, R. K., 2012. Fish Research Center, Lake Side, Baidam, Pokhara. Tel No.- 061-462004.

Shrestha, S.B., Shrestha, T. K., and B. R. Pradhan. 1979. Report on the Study of Aquatic Ecology and the Potential of Fisheries Development in Bagmati River. Project report Prepared for GTZ - Bagmati Multipurpose Project.

Tseng, Y., Yue, W. L. and Taylor, M. 2005: The Role of Transportation in Logistics Chain. Proceedings of the Eastern Asia Society for Transportation Studies, Volume 5: pp. 1657 – 1672.