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CONTENTS

Sr. No.	TITLE & NAME OF THE AUTHOR (S)	Page No.
1.	PROFESSIONAL COMMITMENT IN HIGHER EDUCATION: AN EMPIRICAL STUDY <i>H. SHAMINA & DR. VIJILA KENNEDY</i>	1
2.	STRESS MANAGEMENT IN RELATION TO SOCIO ECONOMIC STATUS OF SECONDARY SCHOOL STUDENTS <i>DR. DEEPA. P & SUJA. P.V</i>	5
3.	PREDICTIVE ANALYTICS: A WAY TO PROACTIVE ACTIONS IN HUMAN RESOURCE MANAGEMENT <i>VIKAS BANSAL</i>	7
4.	CAPITAL STRUCTURE AND ITS IMPACT ON PROFITABILITY: EVIDENCE FROM SRI LANKAN LISTED BANKS <i>V. A. SUBRAMANIAM & RAVIVATHANI THURAISSINGAM</i>	10
5.	VALUE ADDITION IN FISHERY MARKETING, GAINS AND LOSSES ALONG THE SUPPLY CHAIN IN INDIA <i>SHIFERAW MITIKU TEBEKA, EMMANUEL ZIVENGE, USHADEVI K.N & K. JESY THOMAS</i>	14
6.	A STUDY ON PRE-PURCHASE BEHAVIOR OF TWO WHEELER MOTORCYCLE USERS IN NELLORE DISTRICT, ANDHRA PRADESH, INDIA <i>DR. D. V. RAMANA, DR. P. SUBBIAH & P. V. L. NARASIMHA RAO</i>	17
7.	A FRAMEWORK OF AUDIT REPORT IN BANK AUDIT: STUDY ON LFAR, GHOSH & JILANI AND BASEL COMMITTEE REPORT <i>DR. AKHIL MISHRA & NEHA JAISWAL</i>	25
8.	DEVELOPMENT OF SELF HELP GROUPS IN TAMIL NADU <i>J. PAVITHRA & DR. M GANESAN</i>	30
9.	PROBLEMS OF PAIN AND PALLIATIVE CARE VOLUNTEERS IN KERALA <i>DR. SANTHA S.</i>	38
10.	MICRO-FINANCE: A BOON TO THE SELF-HELP GROUP MEMBERS IN SIVAGANGAI DISTRICT, TAMIL NADU, INDIA <i>CAPT. DR. JEYA KUMAR, KR. & DR. SREEDEVI.N</i>	44
11.	POLICY HOLDERS AWARENESS AND ADOPTION OF INFORMATION COMMUNICATION TECHNOLOGY OF LIFE INSURANCE CORPORATION OF INDIA <i>S. RANI LAKSHMI & DR. P. SANTHI</i>	51
12.	HRM AND ETHICAL BEHAVIOUR: REVIEW AND CONCEPTUAL ANALYSIS <i>DR. SUPRIYA CHOUDHARY</i>	56
13.	WOMEN ENTREPRENEURIAL OPPORTUNITIES IN FOOD INDUSTRY: A CASE OF CREMICA PRODUCTS <i>VANIKA CHUGH & MANISH JHA</i>	60
14.	FACTORS INFLUENCING BRAND SWITCHING IN TELECOM INDUSTRY: WITH SPECIAL REFERENCE TO LUDHIANA CITY <i>PREETI THAKUR, KARAN JOSHI & PRACHI KAPIL</i>	65
15.	ROLE OF FINANCIAL INSTITUTIONS IN DEVELOPMENT OF MSME AND AGRICULTURAL SECTOR IN INDIA: A VISION FOR YEAR 2020 <i>AMOGH TALAN & GAURAV TALAN</i>	73
16.	IMPACT OF MONETARY POLICY ON BSE BANK STOCKS <i>MANISHA LUTHRA & SHIKHA MAHAJAN</i>	78
17.	MOBILISATION AND MANAGEMENT OF FINANCIAL RESOURCES BY URBAN LOCAL BODIES <i>YASHODA</i>	80
18.	AN EMPIRICAL ANALYSIS OF FACTORS AFFECTING INTERNET BANKING IN PUNJAB STATE (INDIA) <i>RITU SEHGAL</i>	83
19.	RUPEE DOWNFALL: A THEORETICAL OUTLOOK <i>GEORGE PAULY & ARUN B CHANDRAN</i>	90
20.	A COMPARATIVE STUDY ON THE PERFORMANCE OF SELECTED MUTUAL FUND TAX SAVING SCHEMES: AN IMPLICATION OF SHARPE'S MEASURE <i>RAJIB DEB</i>	95
21.	AN ANALYSIS OF CASE STUDY PROPRIETORSHIP AND SATURATION - CASE STUDY SOURCE FROM 'DHURVA INSTITUTE OF MANAGEMENT HYDERABAD INDIA': INTERNATIONAL CASE STUDY COMPETITION, AUTHOR: DR.JAGADEESHA.M <i>ESAYAS DEGAGO & TESFAYE HAILU</i>	103
22.	EXPLORING THE FACTORS LEADING TOWARDS STUDENT DEVELOPMENT: A STUDY OF UNIVERSITY STUDENTS OF PAKISTAN <i>HINA AFFANDI, NAHEED RAZA & ANUM AFFANDI</i>	105
23.	CUSTOMERS' PERCEPTION TOWARDS ONLINE ADVERTISEMENT AND ITS IMPACT ON PURCHASE BEHAVIOUR <i>VIPIK KUMAR</i>	110
24.	LOK ADALAT IN JAMMU AND KASHMIR: AN EMPIRICAL ANALYSIS <i>UNANZA GULZAR</i>	114
25.	DISCLOSING NONFINANCIAL INFORMATION LEADS TO THE SHAREHOLDERS' WEALTH MAXIMIZATION: EVIDENCE FROM BANGLADESHI LISTED FINANCIAL COMPANIES <i>SALEH MOHAMMED MASHEHDUL ISLAM</i>	117
26.	MAHATMA GANDHI: DEMOCRATIC LEADERSHIP AND HIS ECONOMIC VISION <i>NEHA BOTHRA</i>	124
27.	ANALYSIS OF EMPLOYMENT DISCRIMINATION OF SCS AND STS IN NATIONAL RURAL EMPLOYMENT GUARANTEE SCHEME (NREGS) <i>SIDDHARTH RATHORE</i>	128
28.	EUROPEAN UNION AS A GLOBAL SECURITY ACTOR <i>H.S VENKATESHA</i>	134
29.	FINANCIAL INCLUSION: A STUDY OF CANARA BANK <i>AMANJOT SINGH</i>	139
30.	THE POPULATION GROWTH AND ECONOMIC DEVELOPMENT <i>SANGHARSHA BALIRAM SAWALE & NEHA RAKESH NAMDEO</i>	143
	REQUEST FOR FEEDBACK & DISCLAIMER	146

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VALUE ADDITION IN FISHERY MARKETING, GAINS AND LOSSES ALONG THE SUPPLY CHAIN IN INDIA**SHIFERAW MITIKU TEBEKA****RESEARCH SCHOLAR****COLLEGE OF CO-OPERATION, BANKING & MANAGEMENT****KERALA AGRICULTURAL UNIVERSITY****KAU PO****EMMANUEL ZIVENGE****RESEARCH SCHOLAR****COLLEGE OF HORTICULTURE****DEPARTMENT OF AGRICULTURAL ECONOMICS****KERALA AGRICULTURAL UNIVERSITY****KAU PO****USHADEVI K.N****ASSOCIATE PROFESSOR****COLLEGE OF CO-OPERATION, BANKING & MANAGEMENT****KERALA AGRICULTURAL UNIVERSITY****KAU PO****K. JESY THOMAS****PROFESSOR****COLLEGE OF HORTICULTURE****DEPARTMENT OF AGRICULTURAL ECONOMICS****KERALA AGRICULTURAL UNIVERSITY****KAU PO****ABSTRACT**

Indian fisheries and aquaculture is an important sector. It provides food, nutritional security to the food basket, contributing to the agricultural exports and engaging about fourteen million people in different activities. Despite rapid growth in total fish production, a fish farmers' average annual production in India is only 2 metric tonnes per person, compared to 172 tonnes in Norway, 72 tonnes in Chile and 6 tonnes per fisherman in China. Thus, this study examined challenges faced by the sector and opportunities that could be exploited to increase the market share along the supply chain. In order to examine challenges faced by the sector and opportunities that can be exploited to increase the market share along the supply chain secondary data were collected from different private and government organizations. Descriptive analysis was employed in this study. The study found that there was a high loss at producer level compared to marketing level and consumer level by 4.75% and 9.53% in marine fisheries sector and 2.96% and 9.42% in inland fisheries sector respectively. The study conclude that, compromising the quality of any product at any stage of the supply chain would have an impact on the next level of the chain similarly; quality deterioration at producer stage of the supply chain contributes for the percentage loss in the marketing stage of the supply chain.

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KEYWORDS

Market, Value addition, Fish, supply chain.

INTRODUCTION

Indian fisheries and aquaculture is an important sector. It provides food, nutritional security to the food basket, contributing to the agricultural exports and engaging about fourteen million people in different activities. With diverse resources ranging from deep seas to lakes in the mountains and more than 10 percent of the global biodiversity in terms of fish and shellfish species, the country has shown continuous and sustained increments in fish production since independence. Constituting about 4.4 percent of the global fish production, the sector contributes to 1.1 percent of the GDP and 4.7 percent of the agricultural GDP. The total fish production of 6.57 million metric tonnes presently has nearly 55 percent contribution from the inland sector and nearly the same from culture fisheries. Paradigm shifts in terms of increasing contributions from inland sector and further from aquaculture are significations over the years.

According to the Food and Agriculture Organization (FAO) of the United Nations, fish output in India doubled between 1990 and 2010. India has 8,118 kilometres of marine coastline, 3,827 fishing villages, and 1,914 traditional fish landing centers. India's fresh water resources consist of 195,210 kilometres of rivers and canals, 2.9 million hectares of minor and major reservoirs, 2.4 million hectares of ponds and lakes, and about 0.8 million hectares of flood plain wetlands and water bodies. As of 2010, the marine and freshwater resources offered a combined sustainable catch fishing potential of over 4 million metric tonnes of fish. In addition, India's water and natural resources offer a tenfold growth potential in aquaculture (farm fishing) from 2010 harvest levels of 3.9 million metric tonnes of fish, if India were to adopt fishing knowledge, regulatory reforms, and sustainability policies adopted by China over the last two decades.

The marine fish harvests in India consist of about 65 commercially important species/groups. Pelagic and mid water species contributed about 52% of the total marine fish in 2004. India as one of major suppliers of fish in the world, in 2006 the country exported over 600,000 metric tonnes of fish, to some 90 countries, earning over \$1.8 billion. Shrimps are one of the major varieties exported. The giant tiger prawn (*Penaeus monodon*) is the dominant species chosen for aquaculture, followed by the Indian white prawn (*Fenneropenaeus indicus*). Shrimp production from coastal aquaculture during 2004 stood at approximately 120,000 tonnes. Farmed shrimp accounted for about 60% of shrimp exported from the country.

The country has 429 Fish Farmers Development Agencies (FFDAs) and 39 Brackish water Fish Farms Development Agencies (BFDAs) for promoting freshwater and coastal aquaculture. The annual carp seed production is to the tune of 20 billion and that of shrimp about 8 billion, with increasing diversification in the recent past. Along with food fish culture, ornamental fish culture and high value fish farming are gaining importance in the recent past. With over 2.4 lakh fishing crafts operating in the coast, six major fishing harbours, 40 minor fishing harbours and 151 landing centres are functioning to cater to the needs of over 3.5 million fisher folk (National Fisheries Development Board, 2013).

Fish and fish products have presently emerged as the largest group in agricultural exports of India, with 5.2 lakh tonnes in terms of quantity and Rs.7,200 crores in value. This accounts for around 3% of the total exports of the country and nearly 20% of the agricultural exports. More than 50 different types of fish and shellfish products are exported to 75 countries around the world (National Fisheries Development Board, n.d).

Despite rapid growth in total fish production, a fish farmers' average annual production in India is only 2 metric tonnes per person, compared to 172 tonnes in Norway, 72 tonnes in Chile and 6 tonnes per fisherman in China. Thus, this study examines challenges faced by the sector and opportunities that can be exploited to increase the market share along the supply chain.

MATERIALS & METHODS

In order to examine challenges faced by the sector and opportunities that can be exploited to increase the market share along the supply chain secondary data were collected from different public and private organizations sources. Descriptive analysis was employed in this study.

RESULT AND DISCUSSIONS

CHALLENGES AND OPPORTUNITIES ALONG THE SUPPLY CHAIN

Table 1 shows percentage losses at each level of supply chain in inland and marine fisheries sector.

TABLE1: PERCENTAGE LOSSES AT EACH STAGE OF SUPPLY CHAIN

Supply chain	Percentage loss at each level of supply chain in inland fisheries sector	Percentage loss at each level of supply chain in marine fisheries sector
Producer level	1.86 % to 13.94%	3.61% to 14.48%
Market level	0.29 % to 10.98%	0.14 % to 9.73 %
Consumer level	3.94% to 4.52%	1.93 to 4.95%

Source: Central Institute of Fisheries Technology, 2013.

The range of loss indicated that, there is a higher loss at producer level compared to marketing level and consumer level by maximum of 4.75% and 9.53% in marine fisheries sector and 2.96% and 9.42% in inland fisheries sector respectively. This could be caused by some of the key challenges faced by the sector along the different stage of supply chain which are noted by several researchers which hinder to add value on fishery products in order to boost the share of the income realised by the producer. Among the major challenges at producer level of the supply chain which are responsible for the percentage loss of 2.74% to 14.21% both from in inland and marine fisheries sector could be lack of timely adequate inputs, high cost of labor and raw materials, lack of clean water, lack of indigenous equipments, inadequate extension personnel and training facilities, non-availability of cheap electricity and lack of adequate infrastructural facilities. In addition, the absence of quality control at primary production centres (landing centres) often results in poor quality of the products due to lack of facilities for onboard storage, freezing or processing, quality ice and packaging material. These factors were also noted by Shyam and Narayanakumar (2012) namely; technological constraints, lack of expertise in hatchery and farming practices, shortage and high cost of labour, market failure, absence of proper water leasing policies in most of the states, risks due to environmental variations and climate change and huge investment costs. A study by World Bank (2010), confirmed that that, poor post-harvest handling has led to high losses (up to 15 percent).

At the market level of the supply chain of fishery sector, the percentage loss is less than with that of producer level of supply chain whereas, it is greater than at consumer level of the supply chain. The range of loss of indicated that, there is a higher loss at market level of supply chain compared to consumer level by 6.46% in inland fisheries and 4.78% in marine fisheries sector. However, the percentage loss from producer level supply chain to market level is decreased by 2.96% in inland fisheries sector and 4.75% in marine fisheries sector.

The sector experiences several constraints at each level of the supply chain and some of the challenges at market level of the supply chain might be emanating from the grassroots level of producer stage particularly the lack of quality product. In addition, there are factors responsible for the loss at marketing stage of the supply chain viz., lack of proper market intelligence and poor market news leads to lag in equipping the seafood traders, lack of proper forward and backward market linkages in both capture fisheries and aquaculture sectors eventually affects the efficiency and viability of most of the exporting firms. The lack of market and product information leads to demand and supply constraints.

Compromising the quality of any product at any stage of the supply chain would have an impact on the next ladder of the chain. Similarly; quality deterioration at producer stage of the supply chain contributes for the percentage loss in the marketing stage of the supply chain. At consumer level there is a lesser percentage loss than in market level of supply chain by 6.46% in inland fisheries and 4.78% in marine fishery sector. Generally the results are supported by studies which were conducted by (Pazhani, K., 2008, World Bank, 2010, Ganesh, K.B., et al., 2008).

The marketing strategy currently adopted by the sector in order to enhance the value addition of fishery product are dissemination of technological information, providing consultancy and guidance services for technology transfer, organization of training courses, product testing through and participation in exhibitions, organizing meetings, workshops, film shows in the sector like: Indian Council of Agricultural Research(ICAR), Central Institute of Fisheries Technology (CIFT), Marine Product Export Development Authority (MPEDA ...etc). These all strategy needs to be utilized efficiently specially for value addition of fisheries along the different level of the supply chain by the stockholders. Therefore, producer, marketer, researcher and scientists have to be the front line to be part of the strategy to take over the advantage derived from value addition.

The fish catch and waste are either used for fish meal or manure. Fish skin is used for gelatin production and scales of fishes are used to make curries and collagen as a value addition (MPEDA, 2013). However, still there is a need for more investments for further value addition on waste management of fish for better utilization to increase the income derived from it.

TABLE 2: PERCENTAGE OF FISH DISPOSITION IN DIFFERENT SUPPLY CHAIN STAGE, FOR THE YEAR 2012

Supply chain stages	Percentage
Marketed fresh	74.5 %
Marketed as processed in frozen form	8.5 %
Marketed as cured fish	10%
Marketed as processed in other form	7%

Source: Central Institute of Fisheries Technology, 2013.

The data for the disposition of fish catch from in India show, 74.5% is marketed as fresh fish, 8.5% is marketed as processed in frozen form, 10% is marketed as cured fish and 7% is marketed as processed in other forms. This clearly shows a large gap to be addressed in order to increase the income realized by the sector through value addition. Value addition in each and every stage of the supply chain, starting from introduction of newer products from cheap fish is the solution to the existing fish marketing problem, particularly, in order to boost the income realized by the country from the sector. Scope for improvement in product development is evident from the fact; ready-to-eat and ready-to-cook fish products have high demand in both domestic and export market. However, the

strategy adopted in India is lagging behind this fact. There is a huge gap that need to bridge, which is in a range of 74.5% of the fish catch marketed as fresh. This can be one of the potential marketing opportunities to further add value in order to trap the high demand both domestic and export market.

Demand for fish and fishery products are increasing considerably, both at domestic and export front. This has been caused due to the health concerns and the perception of fish as a healthy food with high levels of digestible protein and cholesterol lowering capabilities. This can be an opportunity to the fishermen as a market expands. Thus, higher productivity, knowledge transfer for sustainable fishing, continued growth in fish production with increase in fish exports have the potential for increasing the income of Indian fishermen.

The total production of fish in India for the year 2012 accounted 86.66 lakh tonnes, of this 52.95 lakh tonnes from inland fish and 33.75 lakh tonnes from marine fish production. From the total production of fish in India, 862021 tonne of fish with Rs 16597.23 in crore were exported and the remaining fish produced were consumed domestically. These empirical data clearly show there is a need to target the export market, because from the total production of fish in India, 7803979 tonne is being consumed domestically. There is a need to increase the volume of fish exported from India since; the export market is lucrative to the sector.

RECOMMENDATIONS

- Incorporating modern facilities at harbors and landing centers and improving hygienic and quality standards in fish handling and transportation in order to make Indian fishery product demanded as it will be satisfying the world class standard.
- Quality standard should not be compromised regardless of where the fish is marketed whether it is in the domestic market or in the international market. There is a need to introduce statutory measures in domestic fish marketing system to ensure hygiene standards as well as establishment of cold chain for transportation and storage of fish to sustain its quality.
- In order to enhance the unit value realization, there is a need for factories to avail the raw product into attractive ready to eat consumer products from low value fishes so as to utilize discards into valuable resources.
- In order to prevent post harvest losses and hygienic handling of fish, extension schemes like using suitable fishing gears, use of ice boxes, improved storage, packing and transportation conditions, training the various client groups on the improved handling practices and improved processing techniques have to be intensified by various fisheries departments from government and private wings.
- Fish by nature is a highly perishable food, time factor is very crucial for management of this commodity. Therefore, in adding value at each stage of the supply chain there is a need of basic infrastructural facility particularly, market ecosystem (storage facility like cold room).

CONCLUSION

Individual and government effort is required to assure the quality standard of fish in order to ensure income realised by fish farmers at the grass root level and along other stages of the supply chain is increased. Value addition to the existing product at each supply stage can bridge the unit value realised by the farmer with existing difference at a fish farmers' average annual production in India with the rest of the world like a fish farmers' average annual production in Norway, Chile, and China.

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