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## Marine Fisheries Trade in India: Perspectives and paradigms

**Shyam S Salim and Bindu Antony**

Socio- Economic Evaluation and Technology Transfer Division,,  
Central Marine Fisheries Research Institute, Kochi-682 018

### Introduction

The marine fish landings across the years had increased and the landings were estimated at 3.78 million tonnes during 2013-14. The total valuation of marine fish landings at the landing centre (point of first sales) was estimated at 29872 crores and that of the retail centres was found to be 47186 crores during 2013-14. Over the years the valuation had registered a ten per cent growth in the landing centre and more than 20 per cent in the retail markets. The markets had been the major driving force behind the realization of the huge value of landings. It is also important to note that the marketing efficiency was found to be quite high with the fishermen share in the consumer's rupee of 63.88 per cent. Nevertheless the producer share in the consumer's rupee has varied sizeable based on the commercial value of fish, seasons, landings source and proximity to consumption centres.

Markets had been the major drivers for the fisheries production system channelling the fish landed/produced in realizing the value. The functional growth of the markets in terms of its size, designs, infrastructure, realm of functioning, degrees of competition, nature and volume of transactions, periodicity played a major role in the realization of such high value at the different constituents of the value chain. With the changing economic scenario and fish being a vital commodity being traded at the domestic and international markets, importance of fish in the food and nutritional security, employment generation and income earning the marketing of fish plays a very important role in the fishing business. Since there is significant geographic separation between the production centre and consumption centre it is important to ensure that there exists adequate marketing systems in terms of functionaries, infrastructure etc. Amidst such huge investment there exists a scope for ensuring an efficient marketing systems aimed at ensuring that the fish reaches the different markets within the minimal possible time, cost and spoilage so that the best prices are made

available. Again the channels reach to branch out to the different non-traditional production centre. The purchasing power of the Indian consumer increased leaps and bound but it is important to ensure that fishes aren't exported alone but also made available to the domestic consumers. It's been found that bumper catch of fish/trash fishes/ fishes of small sizes/ non-conventional fishes/ by catches suffers a marketing gap and are often converted into fish meal. On account of increasing fish consumption and the stature achieved more than a poor man's protein it is very important to ensure that the fish is made available to every consumption pockets with the minimal time lag

The marketing system also poses a scope for more institutional interventions .The current level of marketing couldn't ensure high quality of fish on account of unhygienic practices and doesn't offer much option for the consumers. The fish needs to reach the different nuke and corners of the country for which the market potential is to estimate .It is important to note that the fish consumption is restricted mostly within the near vicinity of less than 50 km of the production centers. There if found to be movement of fish across the different districts/ states which could solve the seasonality issues of fish in the country. Nevertheless the demand patterns have improved much and the increased fish consumption was found mostly among the existing fish consumers rather than adding new consumers into the fish consuming population. It is estimated that 56 per cent of the population eat fish with a per capita consumption of 4kg/ annum.

Amidst the technological innovations, improvements in the infrastructure over the years the marine fish marketing is grappled with numerous bottlenecks at the production, distribution and consumption centres. These had been due to the inelastic nature of supply and distress sale, seasonality of landings during peak and lean seasons, huge amount of by catch/ discards due to non-efficient marketing systems and latent markets, distress sales due to the geographical

differentiation of the production and consumption centre, indebtedness to the middlemen (traders), lack of institutional and policy support, inadequate cold chain facilities, lack of value addition, poor marketing infrastructure, improper fish handling, seasonal variations in demand & supply, unhygienic handling and poor quality control, unethical trade practices and highly localized preferences.

### Fisheries sector: The setting

Fisheries are one of the fastest growing food sectors in the world. Profitable trade in fisheries sector has been possible due to both supply and demand side factors. As far as supply side is concerned, India is endowed with a large production base which is given in table 1.

Table 1. Fisheries Resources in India

Marine resources	
Length of coastline (km)	8129
Exclusive economic zone (EEZ) million Sq.Km	2.02
Continental shelf ('000 sq.km.)	530
Number of fish landing centers	1376
Number of fishermen families ( lakh families)	0.76
Fisher folk population ( millions)	35.74

Source: From census reports and DAHDF publication

### Role in the economic development

Fishing as an occupation is being practiced in India since time immemorial and has been regarded as a supplementary enterprise of the fishermen community on the subsistence level with little external input. Fisheries sector, however, has a strategic role in food security, international trade and employment generation. The production from marine sector has progressively increased nearly by six times during the past 50 years and the landings were estimated at 3.78 million tonnes during 2013-14. Much of the fishing effort concentrated on the shelf fall within 2-200m depth. Analysis of the sectoral trend indicates that the mechanized sector accounted for 68 per cent, motorized 25 per cent and the rest by artisanal by yield. The inshore waters are under heavy or exhaustive fishing pressure. Present estimates showed that about 1.35 lakh mechanized and motorized crafts and about one lakh non-motorized crafts are engaged in fishing activities in coastal waters.

Although, evolved as a livelihood activity, fisheries sector in India had made rapid changes, transformed itself to the present status of an industrialized multi billion industry, contributing immensely to employment generation, food and nutrition security and foreign exchange earnings to the

country. Contribution of the sector to agriculture and national GDP increased steadily over the past few years. The GDP of fisheries sector reached at Rs.78,000 crore during 2012-13 from Rs.9000 crore during 1993-94. Currently, fisheries contribute 0.83 per cent to national GDP of the country and 4.74 per cent of agricultural and allied activities. Marine fisheries sector also provides employment to nearly 32 lakh people in fishing and allied activities. About 11 lakh people are employed in fishery related activities like marketing of fish, repairs of nets, processing of fish, etc.

### Domestic trade

The domestic fish marketing system in India is mainly carried out by private traders with a large number of intermediaries between producer and consumer, thereby reducing the fisherman's share in consumer's rupee. 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).

The main stakeholders involved in fishing industry are largely classified under the following categories:

- Producers – those involved in fishing and other production-related activities, including the shore based owners of production-related tools;
- Processors – those involved in traditional fish processing activities (such as drying and salting) as well as those in export processing (peeling, freezing, packing);
- Traders – those involved in trading of fish, ranging from small-scale fish vendors selling fresh or dried fish (including some whose transactions are only partly monetized), to large-scale operators catering to urban and export markets. This group also includes a vast array of market intermediaries;
- Ancillary workers – those involved in various support activities directly related to fishing (boat builders, mechanics, ice plant operators and sellers, transporters, net makers and menders, basket makers and sellers, etc.);
- Supplementary workers – those involved in support activities not directly related to fishing, but are essential components of the fishing economy (For example, sellers of supplies, clothes, and suppliers of consumption credit.)

### Trade Dilemma in fisheries sector

There are very many actors/constituents involved in the sector which makes decisions related to trade more and more complex. The trade dilemma experienced in fisheries sector across the different constituents/actors is given the figure 1.

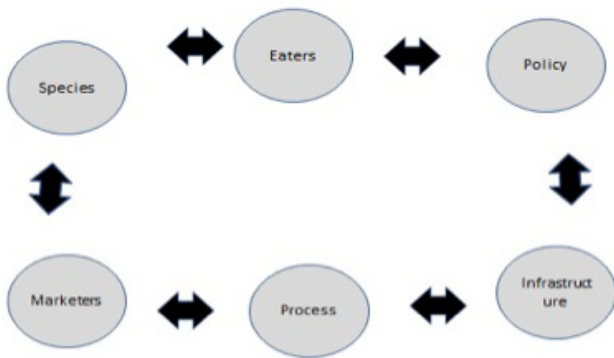


Fig.1 Traders dilemma in fisheries sector

### Species composition

The bulk of the catch commercially traded in India comprises by penaeid and non penaeid prawns; oil sardines, Indian mackerel, croakers, ribbon fishes and squids. The details of the major commercially traded fish species in India is given in Table 1.

The marine fish landings across the years had increased and the landings were estimated at 3.78 million tonnes during 2013-14. The total valuation of marine fish landings at the landing centre (point of first sales) was estimated at 29100 crores and that of the retail centres was found to be 46250 crores during 2013. Over the years the valuation had registered a ten per cent growth in the landing centre and more than 20 per cent in the retail markets

### International trade

The fisheries sector has been one of the major contributors of

Table 1. Important species/groups

Sl. No	Species	Share in Qty	Share in point of first sales	Share in point of last sales
1.	Penaeid prawns	5.24	17.17	18.42
2.	Non-penaeid prawns	5.67	8.85	8.35
3.	Oil sardine	15.79	8.62	8.52
4.	Ribbon fishes	6.60	7.29	6.64
5.	Indian mackerel	5.32	5.53	5.48
6.	Croakers	4.75	4.82	4.58
7.	Squids	2.40	4.19	3.93
8.	Cuttlefish	2.19	3.47	3.26
9.	Scads	3.33	2.95	2.59
10.	S. commersoni	0.77	2.78	2.70

foreign exchange earnings through export. Marketing channel of international fish trade is given in figure 3.

Frozen shrimp accounted for 64 percent of the earnings followed by frozen fish and cephalopods. European Union (Spain, Belgium, United Kingdom, Italy, France, Germany, Portugal, and Netherland) is the prime geographic destination followed by US, China, Hong Kong, United Arab Emirates, Canada, Singapore and Thailand for Indian sea food. The marine export value reported during 2013-14 was at 5.08 billion dollars. Sea food exports constitute 70 percent of the total food exports of India, earns foreign exchange.

The share of Indian seafood in the world market has shown an increasing trend over the years. During 2001-07 this increase has been 40% in terms of value. In the last decade the seafood trade doubled both in value and quantity. The

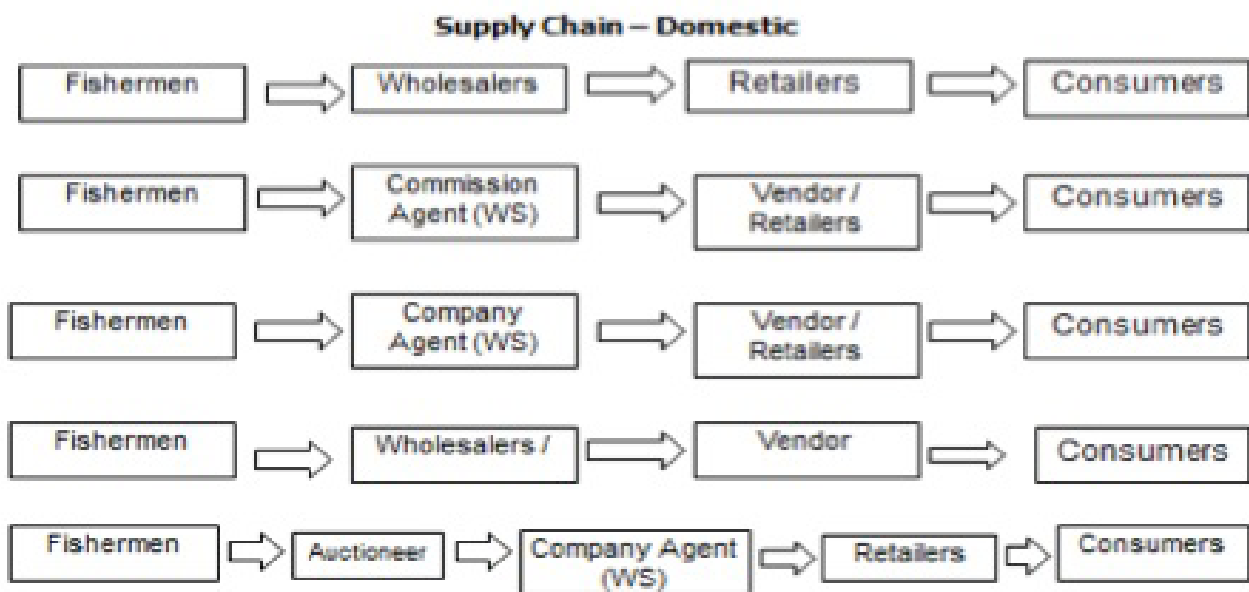


Fig 2. Supply chain- Domestic trade



Fig 3. Supply chain export

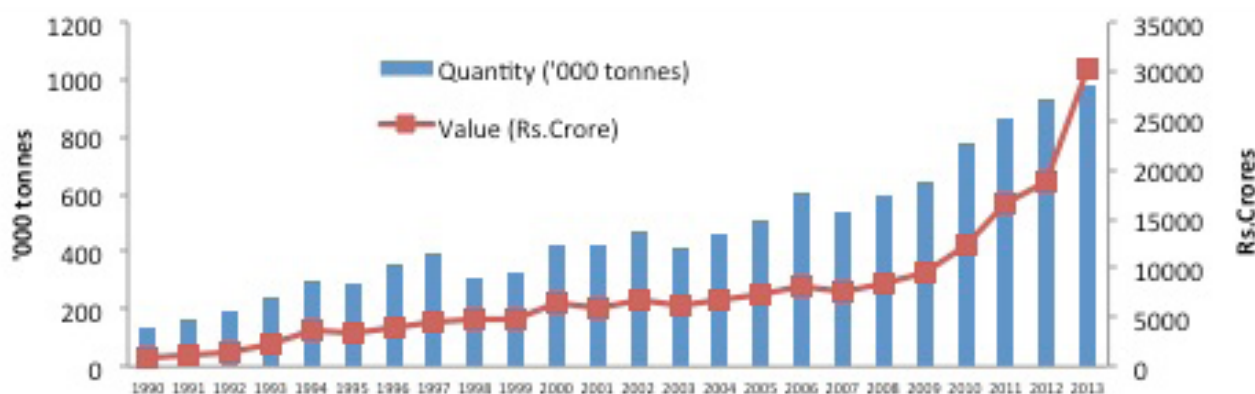


Fig 4. Trends in export of marine products (Source: MPEDA)

major marine products traded by India can be grouped into 9 categories, which includes frozen shrimp, frozen fish, frozen cuttlefish/ squid, frozen lobster, live items, chilled items, dried items, shell, and others

**a. Decomposition analysis of the components of change in average export value of Indian marine products**

In order to examine quantitatively the effect of export quantity, export unit value and their variability on the export value over the year's decomposition analysis was performed. For better understanding the variance of the export value was measured in two-time period viz., pre WTO period (1977-1995) and post WTO period (1995-2013). The export quantity and export unit value of Indian fisheries were de trended for further decomposition analysis.

The results indicated that the contribution of change in mean export quantity was the highest among the other components of change i.e. the increase in mean export quantity accounted for 76.21 per cent of the increase in average export value. This was as expected because the export quantity had recorded significant higher growth rates during both the period whereas the export unit value recorded a negative growth rate during the post WTO period. The changes in the covariance between the mean export quantity and mean export unit value accounted 2.38 per cent increase in the mean export value. The changes in the co-variances could arise through

Table 2. Decomposition analysis was done for decomposing the sources of growth on average export value and variance of export value of Indian marine products

Sl. No:	Source of Change	Pre -WTO (1977-1995)	Post- WTO (1995-2013)
1.	Change in Mean Export Unit Value	1.18	10.29
2.	Change in Mean Export Quantity	95.93	76.21
3.	Interaction between changes in (1) and (2)	3.03	11.12
4.	Change in EQ-EUV covariance	-0.13	2.38

the changes in the variance of export quantity and export unit value. With regard to interaction effect the export quantity was benefited to a small extent (11.12 per cent) from both mean export quantity and mean export unit value. Among the various components, the contribution of change in mean export quantity of Indian marine products was the dominant source for the change in average export value followed by the interaction between changes in the mean export quantity and mean export unit value.

**b. Recession and Indian fisheries exports**

Recession is defined as the significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in production, employment, real income, and other indicators which started in 2007-08 (mostly in developed economies) There exists a lag in recession especially with regard to food demand. The impact has been

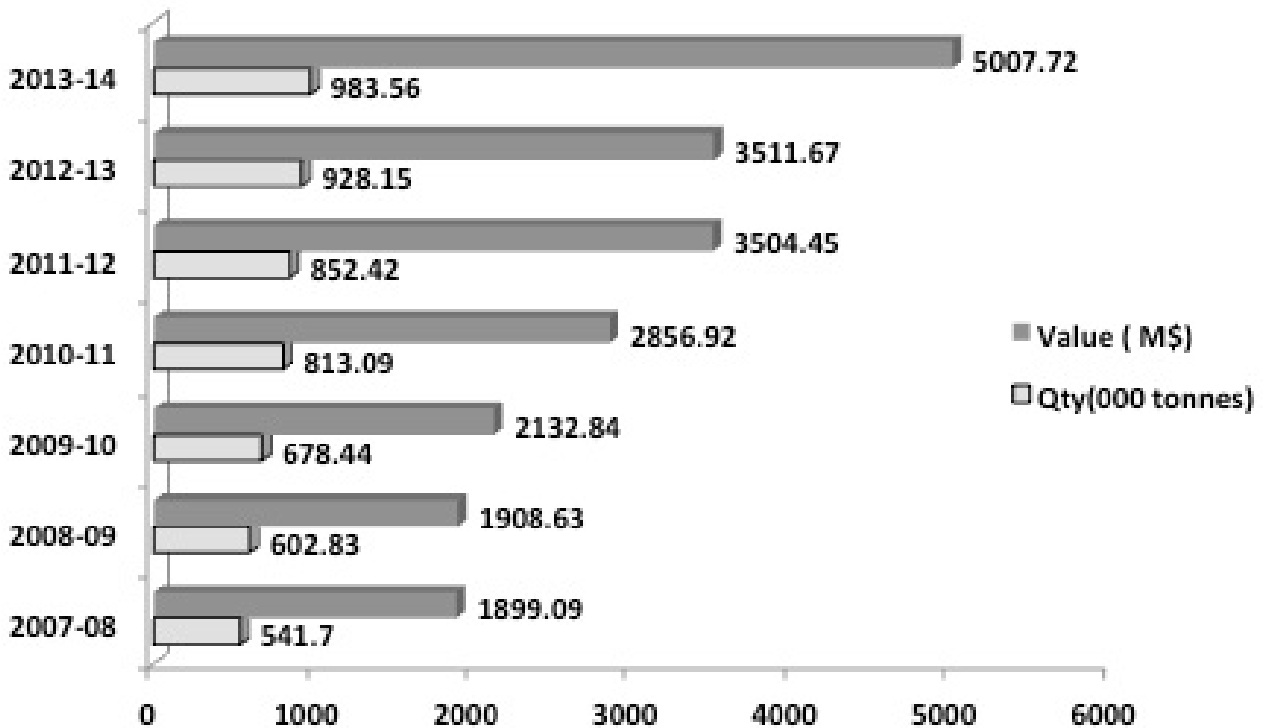


Fig. 5. Recession and Indian fisheries exports

noticed since first quarter of 2009. The Indian seafood export wasn't affected due to the increased demand for raw fish rather than value added products from the retail outlets, declining international market arrivals by over 10 per cent globally across the buyer countries. It was found that the quantity and value are on the high and the emergence of new markets in Latin America and Africa (3.5 and 4.2 per cent Quantity and Value). However there are concerns of unit value declining over the period and growing concern of depreciating rupee compared to dollar increased the earnings and the reduction in the import to China (but channelled through Vietnam was a concern). The export earnings increased considerably (16 per cent in quantity and 14 per cent in value) with the emergence of newer countries as trading partners (Latin American, African and Eastern European). Moreover fisheries sector has been witnessed a sudden spurt of cultured Vannamei white shrimp during this period and its quantity effect well-adjusted the gaps in value effect.

The marine product's exports from India continue to surge up new heights and unabated by global recession. During 2011-12 the quantum of exports surpassed 8.10 lakh tonnes with a forex earning of 2.85 billion dollar. The appreciation of the Indian rupee hasn't much affected the export earnings. The reason for the sustained increase in export is due to the demand for raw fish rather than value added products from the retail outlets as the buyers opted for cheaper fish on account of lower income and increasing unemployment. Nevertheless, being a heavy export earner the fisheries sector is facing numerous problems on account of economic shortcoming, technical constraints, institutional limitation, trade restrictions

and marketing lacunae. Severe competition exists between the different competitors like Thailand, China and South East Asian countries for sustaining the market share by product diversification. The sea food industry in many countries are undergoing a rapid change to process more and more "ready to cook" and "ready to eat" in convenient packs. India's predominant position in shrimp market is being eroded due to the sudden spurt in farmed shrimp production in China, Indonesia, Thailand, Vietnam etc. The problems were again complicated with the restriction placed by USA through imposition of antidumping duties which has been discussed at length in the appellate body but continues to haunt the export industry. Situations aren't rosy with European Union countries with changing quality standards and cases of rejection and alerts.

### Issues in trade

The major problems faced by the Indian sea food exporters listed by one CMFRI study conducted during 2009 to 2011 include irregular supply of raw material, cut throat competition of raw material, heavy competition for target market, low capacity utilisation, higher cost of production and low margin of profit, uncertainty in prices, dictatorship of buyers, high cost of investment, lack of market and product information and barriers in seafood trade in India. The other major bottlenecks in sea food supply chain is given as follows

- Distress sales due to the geographical differentiation
- Seasonality of landings during peak and lean seasons,
- Huge amount of by catch/ discards and latent markets

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- Non-efficient marketing systems
- Indebtedness to the middlemen( traders)
- Inadequate cold chain facilities
- Poor/No marketing of juveniles/trash fishes/non-conventional fishes/small sized fishes
- Lack of value addition/forward integration function
- Poor marketing infrastructure
- Improper fish handling and poor quality control
- Unethical trade practices – limits to entry
- Highly localized preferences
- Lack of demand penetration in the non-production centers
- Inconsistencies in demand
- Lack of institutional and policy support
- Failure to attract new consumers of fish
- Lack of awareness in consumption

### Should we really need to export ?

The scope of domestic trade over international trade is found to be high on the grounds of some prospective features of the domestic market like increasing purchasing power, price discrimination/realisation, increasing awareness, matching demand and supply and efficient marketing system and it really show the way to the fact that do we really export the fish?

### New initiative –Fish Market grid

Smaller-scale fishers are often unable to gain access to more efficient marketing systems and supporting infrastructure (ice, cold storage, etc.) that would lead to better quality and prices. There is inadequate information about market

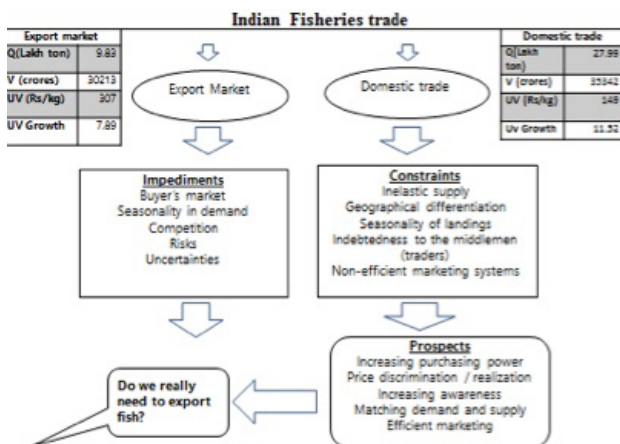


Fig 6.Indian fisheries trade

requirements both in India and globally, poor access to market information (especially for small-scale fishers), and insufficient understanding of market chains and emerging opportunities by policy makers and processors. Market Grid has developed towards making an effective decision making tool for identifying better target markets and remunerative prices. Fish is highly perishable, with seasonal distribution, inelastic supply, spatio- temporal price differentials. Decision support

systems eliciting the fish market structure and its prices would be highly advantageous to the different stakeholders with the following outcomes.

- Fishers - Identifying best target market for disposal
- Marketers and traders - Determining fish arrivals / disposal
- Consumers– Rational buying decision
- Exporters - Capacity utilization
- Policy planners – developing market regulations
- The outcomes generated post project will acts as an effective decision making tool for identifying better target markets and remunerative prices.

A Decision Support System with development of a market grid on a spatio-temporal platform was attempted. The spatio-temporal market and price data base for Indian fisheries sector with user driven decision making based on structured and customised queries would be available. The system would include identification of innovative commodity specific fish value chains whose attributes could be replicated in other locations. Emphasis will be given to species, markets and prices in an integrated format which would facilitate market information flows across the stakeholders ensuring affordability and would have a check on national food security. The market grid encompasses different information related to the market structure which includes selected ten dimensions of Location, Access, Timing, Conduct, Species, Arrivals, Disposals, Adequacy, Regulations and Intelligence. These inputs were collected from around 100 markets of the coastal states of Kerala (Ernakulam, Kottayam, Trivandrum, Kollam, Kozhikode, Pathanamthitta, and Alappuzha) Karnataka, Tamil Nadu, Maharashtra and Gujarat. This prototype would aid in developing appropriate domestic policy framework for effective marketing/consumption and an over- arching

### Development of Fish Market grid across the coastal states in India



Fig. 7 Detailed fish market grid across the coastal states of India.



Fig. 8 Fish market grid of Kerala

policy development framework at the centre and state specific marketing policies.

Fish market grid developed for Kerala using market structure information collected and the sequential form of the fish

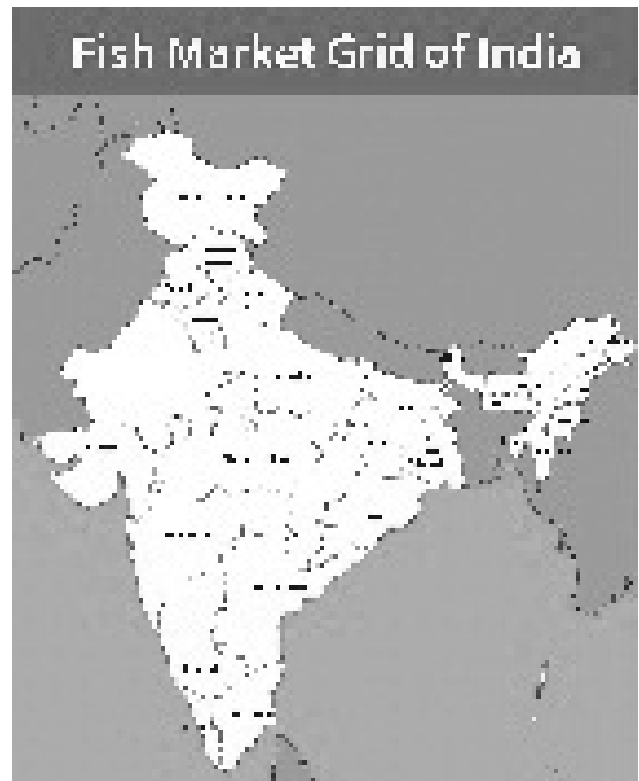


Fig. 8 Fish market grid of India

market grid output is given below in the figures.

### The way forward

Fisheries trade is going to continue as an integral activity of adding to the livelihood of the fisheries and the different

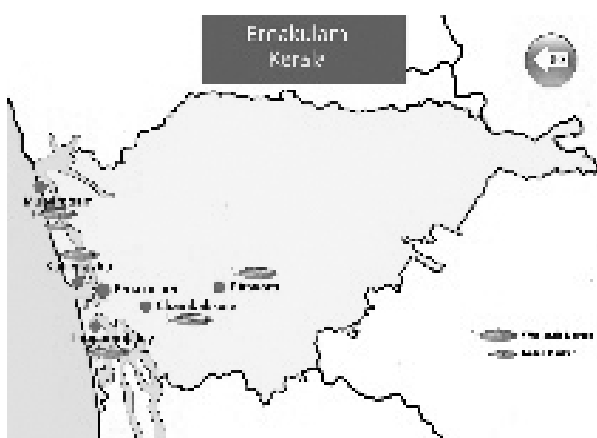


Fig. 9 (a) Fish market grid of Ernakulam



Fig. 9(b) Fish market grid of Kottayam

marketing intermediaries in the business. However with the amount of difficulties and hassles in export it is important to integrate both the domestic and international markets to ensure the sustainability of this fisheries trade. A flow diagram

depicting the same is given in Figure 10.

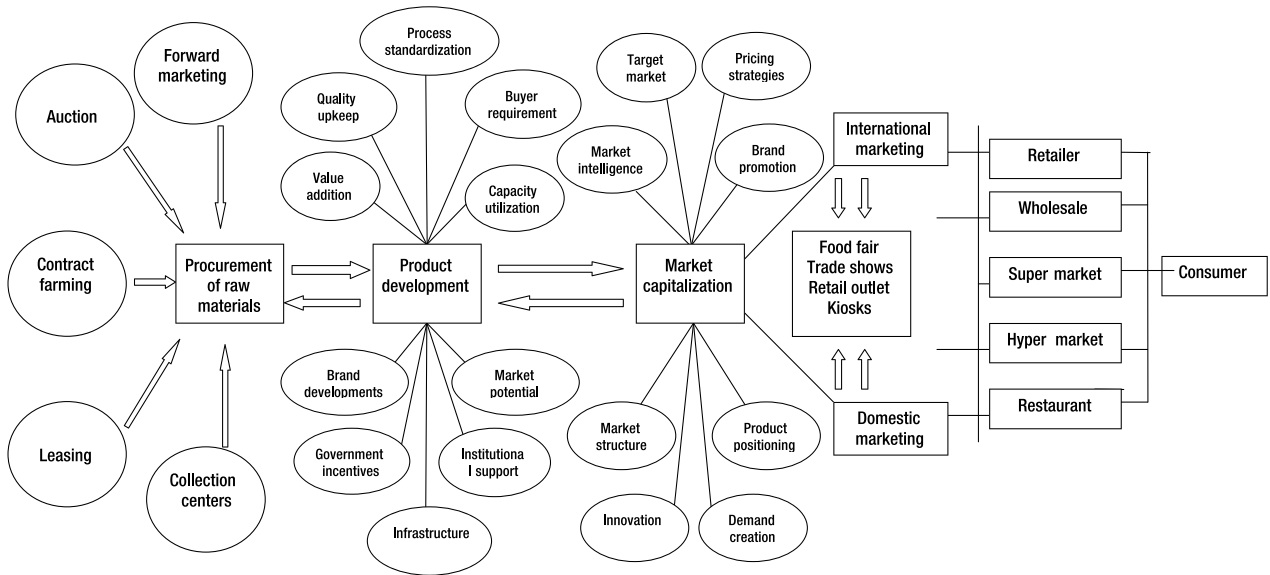


Figure 10.