A Business Model for Inclusive Marketing to improve the profitability of the Fishing Industry in the villages of coastal Mumbai.

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1. Abstract:

The purpose of this research is to study and exploit the opportunities in the fishing industry in the villages of coastal Mumbai. We have identified the major problems affecting the fishermen who fish for a livelihood and have proposed a viable business model that addresses the existing gaps. The business model that we propose here takes care of four important things. First, it aims at improving and maintaining the supply of fish through innovative techniques. Second, it aims at creating a steady and profitable source of employment for the fishermen. Third, it improves profitability through a logistics management and elimination of middlemen. Last, it aims at being all inclusive by managing the waste that is a part of fish processing.

This research paper is based on an extensive secondary research of the current conditions of the fishing industry in India and the latest trends in fishing that can be exploited to improve fish production and supply. It also includes a primary research done with 20 fishermen families in Manori and 15 fishermen families in Gorai. The primary research was conducted to identify the major issues that affect the fishermen families, their technological expertise in fishing and their acceptance of our business idea.

We have done a fish-bone analysis to understand the problems that is affecting these two villages. We have also developed a two-by-two model to explain the business approach that should be used for a fishing location based on its production capacity and distance from the nearest targeted market.

We have proposed the use of Deep Sea fishing and Mariculture to improve the supply of fish. Mariculture would help our business to produce export quality fish and also for supply to the premium segment in top-tier cities. We propose to employ the fishermen rather than buying the fish from them. Our business model has a Milk Run Cross Docking transport system which not only eliminates all middlemen but also uses it for the transport of waste, equipment, chemicals etc. The produce from our fishing activities will be supplied to the Mumbai market or exported based on real time information of the demand and prices. We have inculcated practices in our model that ensures sustainability.

2. Key Words:

Inclusive Marketing, Fishing Industry, Deep Sea Fishing, Mariculture, Fishermen Empowerment, Fish Waste Management, Sustainability.

3. Introduction:

Inclusive Marketing is the form of marketing practice which is all encompassing. It rests on three pillars, viz, business profitability, the people and sustainability.

Some companies have implemented inclusive marketing to reduce poverty and generate potential business simultaneously. ITC's E-Choupal not only empowers farmers with information, but also acquires their harvests directly by eliminating all middlemen. Project "Shakti" and HP's "Rasoi Ghar" are other prominent examples of the above concept.

Fish production plays an important role in the socio- economic life of India. It is a rich source of protein and high quality food. It is also an important source for income and employment to millions of rural farmers, particularly women. With a large human population in India and over 250 million economically strong potential consumers of food and those who have an adequate purchasing power, the domestic demand for the fish and processed fish food is increasing very rapidly. In Mumbai alone, the demand for seafood is 250 tonnes per day.

Our business model aims at tapping the opportunities in the fishing industry in India by exploiting unused technology and natural resources. It addresses the problems of the fishermen of two villages in coastal Mumbai, Gorai and Manori. The major problem in the villages of coastal Mumbai is the polluted coastline which has depleted all resources of fish. Therefore, despite the growing demand of fish, there is no business because of the lack of supply. We propose to use Deep Sea Fishing and Mariculture to step up the production and processing of fish in these areas.

Our model aims to create a steady employment source for the villagers by giving them all the technical and mechanical requirements to practice Deep Water Fishing and Mariculture. Later in this paper, we have explored the multiple benefits of giving direct employment rather than buying fish from them. We also generate employment in the fish processing centres which require sorting, cleaning, canning, waste processing and information dissemination. We have

done a thorough study on the use of fish waste to produce other products like fertilizers, fish feed and other livestock feed.

We also focus on the sustainability of our model in the long run. For all round development of fisheries sector, it is necessary to: implement the code of conduct for responsible fisheries, utilize strong traditional wisdom and know-how by active community participation, strengthen the capacities of fishers and aqua-farmers regarding latest technological practices, administrative skills, disaster management, etc. and intensify efforts for treating aquaculture at par with agriculture. Waste management is also an important aspect for sustainability. Fish waste can be used to produce fish feed and other livestock feed, fertilizers and biogas and inputs to the pharmaceutical industry. Responsible deep sea fishing practices like sea ranching can ensure sustainability. Sea ranching refers to the deliberate release of organisms from hatcheries into the natural ecosystem. We also propose to use a part of our capital to improve the living conditions of the fishermen and their families. Hence sustainability is a major part of our model.

4. The Fishing Industry in India:

India is the third largest producer of fish in the world and second largest in inland fish production. Fishing industry contributes to 1.1% of the GDP and 4.7% of the agricultural GDP. It contributes 4.4% of the global fish production. Thus has been recognized as a potential employment and income generator. There are approximately 10 million people residing in more than 4000 coastal region who are dependent on fisheries to earn their livelihood.

Fish is a cheap source of nutrition. The important marine fish disposition in India are the Mackerel, Sardines, Bombay duck, Shark, Ray, Perch, Croaker, Carangid, Sole, Ribbonfish, Whitebait, Tuna, Silver belly, Prawn, Shrimp, Squid, Octopus, Red snapper, Lobster, Cat fish and Cuttlefish. The main freshwater fish are carp and catfish; the main brackish-water fish are hilsa (a variety of shad), and mullet. The major ports in India are Chennai, Cochin, Kandla, Kolkata , Mumbai and Vishakhapatnam.(*Supply chain Interventions, Improving socio economic status of Fisherman in India, by Ashutosh Sinha).*

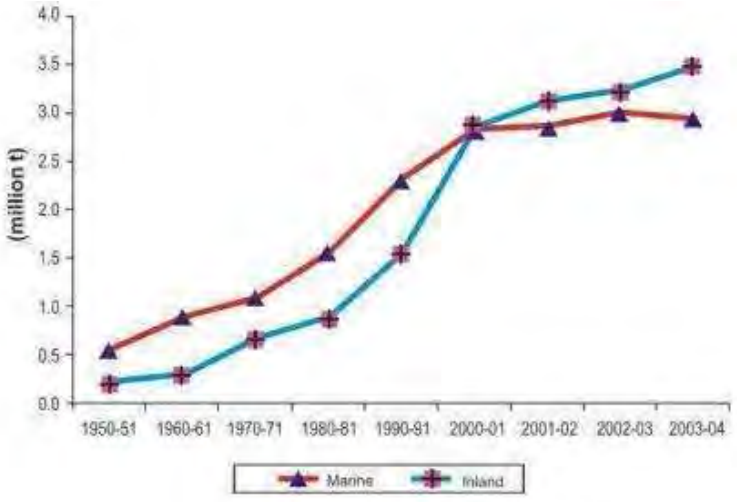
The sector contributes to food security and provides direct employment to over 1.5 million fisher-folks besides others dependent indirectly on the sector. The estimated total marine fisher folk population of 3.57 million is in 3,305 marine fishing villages spread across the

coastal States and Union Territories (including islands). Out of them, about 0.90 million are active fisher people, and another 0.76 million fisher people are involved in other fisheries-related activities (*NFPDB Report, 2009*).

The fish production is either marine or inland. India, being surrounded by water on three sides, has a huge coast line which can be used for marine fishing. West Bengal, Andhra Pradesh, Bihar and Tamil Nadu have many rivers thus provide major portion of the fresh water fish catch in India. There are a large number of stakeholders involved in the process of supplying fishes namely fishermen, auctioneer, warehouse owners, ice providers, transporter and exporter. Each of which is adding to the cost of the fish (*Value chain of Fish and Fishery products: Origin, Functions and Application in Developed and Developing country markets, D.A.M. De Silva).*

The fisheries harbours are not evenly distributed, thus causing congestion on some harbours and leaving some underutilized. Most of the harbours are poorly maintained in terms of storage space, safety measures and water, hence does not satisfy customer needs and reduces fishermen's profit margins.

Figure 1: Fish production from marine and inland sectors in India:



Source : DAHD&F, 2005

Source : http://mofpi.nic.in/images/dpr_nfpdb.pdf

5. Problems at Gorai and Manori, two fishing villages in coastal Mumbai:

Excessive Fishing in the coastline, has swept away everything from the sea, including juvenile and baby fish and all other organisms. This has adversely affected the marine ecosystem as a result of poor replenishment of stock. Domestic and industrial wastes are polluting the water and the creeks. These include sewage, chemical wastes and garbage, especially plastic wastes. Bacteria present in the sewage, consumes oxygen in the water, thus making it difficult for the fish to survive. For real estate and infrastructure development, mangroves and coastal wetlands are being destroyed affecting the nursing grounds for a variety of fish.

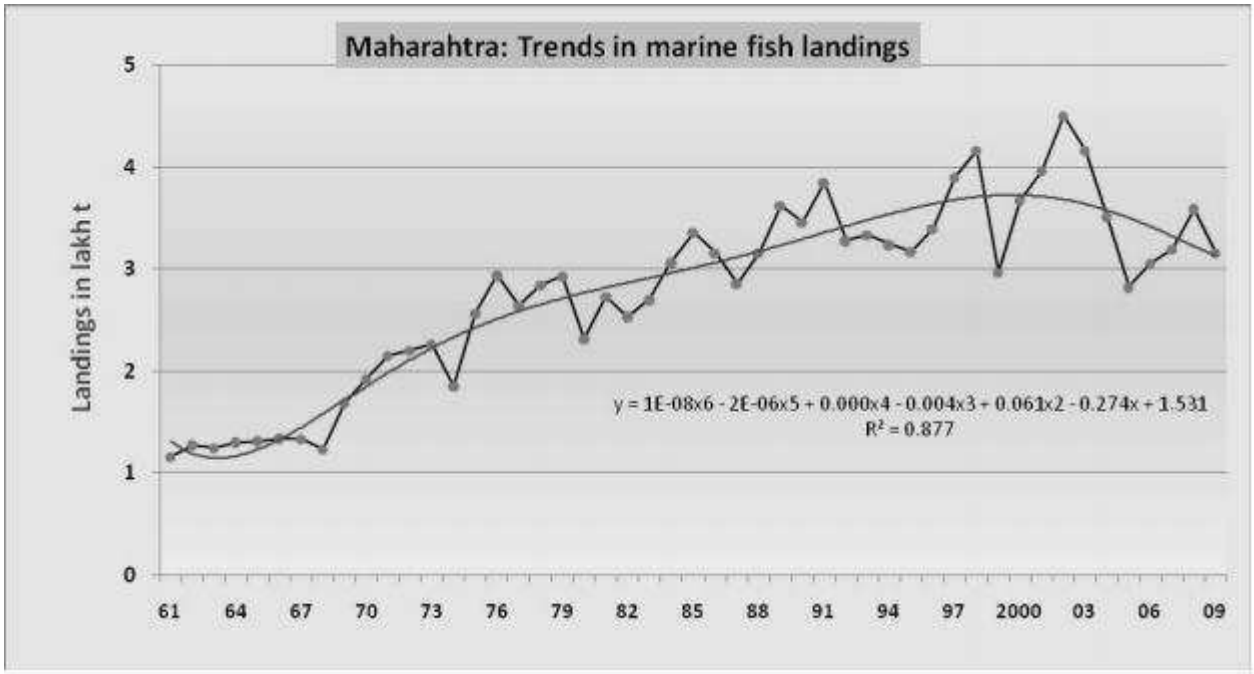
Due to several dams and redirecting of rivers, fresh water is not going to the sea thus increasing its salinity and making it unfit for the fishes to survive.

In addition to this, the local markets are unregulated, with no minimum prices fixed, no control on quality. Standards, improper weighing mechanism add to the dismay of the fishermen and the customer. Facilities required to store and transports goods are not available and even those available are not as per the needs of the fishermen like poor and expensive cold storage, transportation facilities.

In Gorai village even basic facilities like hospital and toilets is not available. The government has put up some floodlights but they don't work most of the time thus the fishermen find it difficult to clean fish in the night. Their demands are only in paper nothing substantial has been implemented.

Manori creek has come under increasing heavy environmental stress, with the depletion of oxygen level and heavy metal contamination, it indicated unacceptable aquatic condition. Due to environmental pollution and overfishing several fishes have moved away from the coast, into deeper water. They lack the capital to buy big boats and different types of nets. Also, now they have to spend more time on boat thus increasing their fuel consumption resulting in higher cost. Fishermen in Manori are not well aware about the modern technologies and equipment used in fisheries.

Figure 2:



Central Marine Fisheries Research Institute, Mumbai

Source :

http://www.ced.org.in/docs/inecc/member_reports/Vulnerabilities_coastal_study.pdf

6. Primary Research:

We conducted a primary research with the fishermen and their families in the villages of Manori and Gorai. The research was conducted through a primary survey based on a questionnaire having both open and close ended questions. A total of 35 fishermen families participated, 20 from Manori and 15 from Gorai.

Aim: To recognize the problems and factors affecting the livelihood of fishermen in Gorai and Manori.

Results of Data Analysis and answers to open ended questions:

a) The mean amount of fish per catch is around 8 kgs.

b) About 70% fishermen sell their fish to the local market rather than to the commission agents.

c) Roughly about 30% of fish gets wasted during

d) 80% of the respondents said they would prefer a fixed income per month.

e) There is a new awareness about the need for education and alternative sources of income in the community. Now they prefer to send their children, both boys and girls, to school and college (in Mumbai city) so that they can take up other jobs and services. Among the educated in Manori, about 50 per cent have finished high school (10th standard) and 30 per cent 12th standard (pre-university stage or junior college as it is popularly known); about 20 per cent are graduates.

f) All the respondents like the idea of being insured against accidents.

g) 80% respondents did not know that fish waste can be processed for making fertilizers, livestock feed and other useful products.

h) We also found out that many parents would not like their children to continue with fishing because of the arduous physical work, the risks and the uncertain future in fishing. For the same reasons, many youth would like to shift to other occupations but lack of higher education, special skills and also communication skills in English have been a handicap in securing jobs in the city with better remuneration than in fishing.

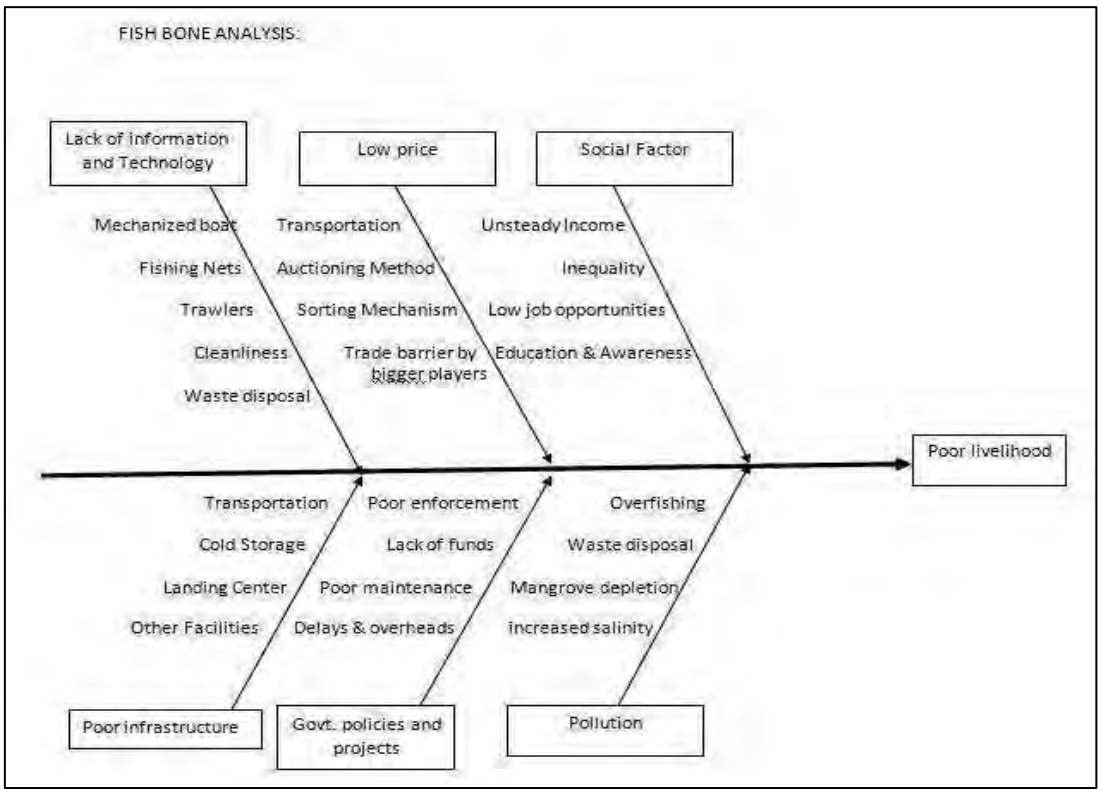
i) Another concern that we found was women have been facing a lot of health problems. As they spend long hours out in the open, selling fish or drying and processing it, higher temperatures combined with high humidity cause greater dehydration. Urinary tract and kidney problems are increasing, though the causes are not clear. Many women, particularly pregnant women, are anaemic, according to local medical doctors.

j) In some cases of major medical problems, they need to go to distant and far off clinics or hospitals in the city, which is very expensive and take a toll on their financial resources. It often leads to debts for the poor.

k) In Gorai village basic facilities like hospital and toilets are not available to the fishermen. The government has given some floodlights but they don't work most of the time thus the fishermen find it difficult to clean fish in the night.

l) The respondents lack the capital to buy big boats and different types of nets. They also have to spend much time on boat thus increasing their fuel consumption which increases their cost. The fishermen in Manori are not much aware about the modern equipment and technologies used in fisheries.

7. Fish Bone Analysis of the Poor Livelihood of Fishing Villages in Coastal Mumbai:



8. Deep Sea Fishing and Mariculture:

Deep sea fishing, is a form of fishing in which people angle for the larger open-ocean. In traditional fishing, marine waters upto 50 meters depth is exploited successfully and the sea beyond this remains under exploited due to lack of adequate infrastructure and expertise. Deep sea fishing involves exploiting medium size fishing vessels that exploit resources at a depth of 70 fathoms with a prolonged cruising period ranging from 4 to 15 days.

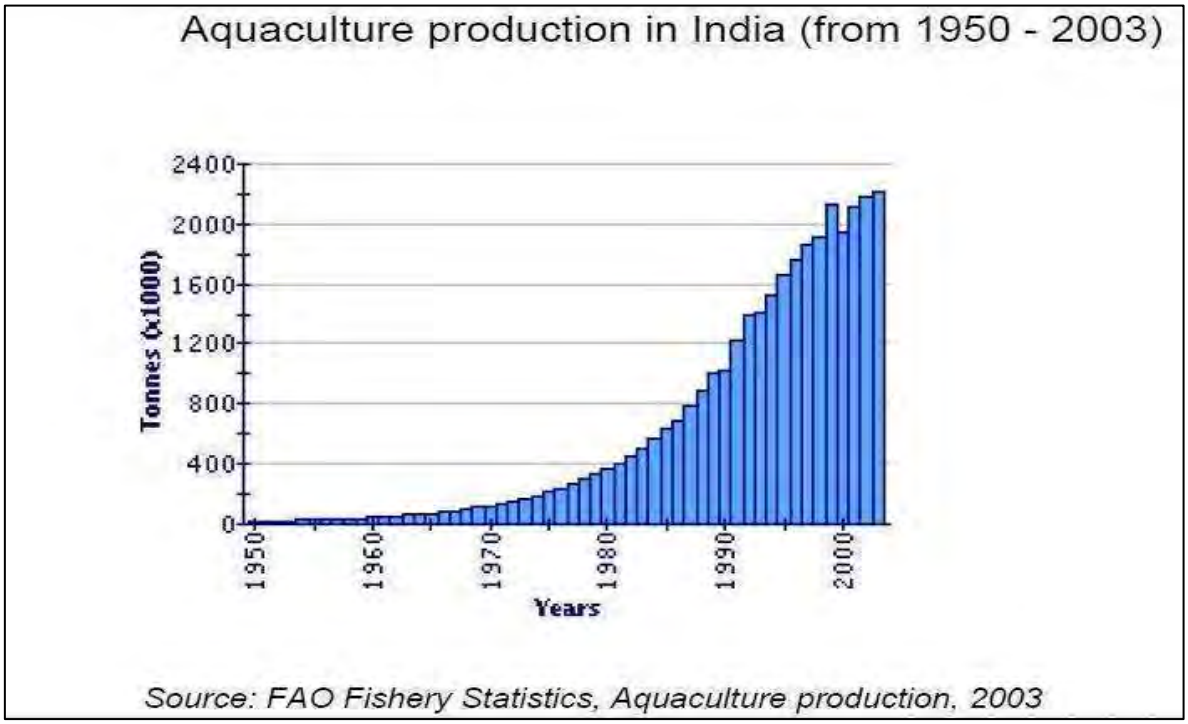
There have been several efforts to maximize fish production in deep sea waters under the aegis of the union government. The Deep Sea Fishing Policy, March 1991 allows Indian entrepreneurs to exploit fisheries beyond the inshore area using state-of-the-art technologies. There are policies which regulate boundaries of EEZ within which deep sea fishing can be conducted, zonalisation to control illegal vessel presence, requirements for private-public partnerships and specifications for the fishing vessels and equipments. Notably, Maharashtra Fisheries Regulation Act (MHFRA) was introduced in the state in 1981.

Modayil, Sathiadhas, Gopakumar, 2003, have discussed the trends in marine aquaculture, or mariculture in India. The mariculture potential of India is vast as there is great scope for

developing farming of shrimps, pearl oysters, mussels, crabs, lobsters, sea bass, groupers, mullets sea weeds etc. Although about 1.2 million ha is suitable for land based saline aquaculture in India, currently only 13 % is utilized. In India till date mariculture activities are confined only to coastal brackishwater aquaculture, chiefly shrimp farming. Shrimp is the most demanded product from coastal aquaculture and India is the 5th top most shrimp producer from culture. In recent years, the demand for mussels, clams, edible oysters, crabs , lobsters, sea weeds and a few marine finfishes is continuously increasing and brings premium price in the international market.

The mariculture related development in infrastructure, technology, processing, value addition and trade in India are almost entirely targeted at and anchored on the prospects for export and earning of foreign exchange. Although India does not have the advantage of extensive shallow seas with calm waters, there exists many potential mariculture sites which are still unutilized, offering tremendous scope for mariculture. Low cost user friendly bivalve mariculture practices provide seasonal vocation for the rural folk. Substantial quantity of crabs and crab products are exported from India. Similarly, demand for finfish also recorded a steady growth both in exports and domestic markets over the last years.

Figure 3:



9. Our Implementation of Deep Sea Fishing and Mariculture to the two villages in Mumbai:

Our business model proposes to implement Deep Sea Fishing (DSF) and Mariculture (MC) off the shores of two closely placed villages Gorai and Manori. The idea is to consolidate the fishing activities in these two villages and conduct fish processing at a common center. This center not only processes the fish but also has an information system which monitors the daily demand in Mumbai's HORECA's and for export.

After the business has been setup, immediate fishing activities start for DSF with the help of 100 ton trawlers which can go out into the deep sea part. An average fishing trip is approximately four to five days and involves spending approximately Rs. 60,000–70,000. The inputs required on the boat include diesel (approximately 2,000–2,500 litres), ice (8–10 tons), helpers 10-12 (average), assistant fishermen aboard the boat and food. *(Current State and Influence of Import Requirements, Parashar Kulkarni, 2005).*

Other than these, relatively small sized fishing boats which can travel longer distances on a daily basis will be employed. Results of primary and secondary research have indicated that consolidated deep sea fishing activities on the offshore of the two villages can fetch a monthly catch of 240 tons.

While DSF operations can be started immediately, some investment in terms of time, money and people are required initially for the Mariculture (MC) Operations. Initially we propose to start with MC with one species. We propose to go for Lobster. According to *Modayil, Sathiadhas, Gopakumar, 2003*, the international demand for lobster is continuously increasing over the years and the targeted fishing has led to over fishing of the same in our coastal waters. Although the unit value realized for each products of lobsters enhanced, the overall value has come down as more and more small sized lobsters were caught from our open sea. It is a highly advisable to go for mariculture of lobsters wherever possible. The productivity of lobster is INR 50,000 from 70 square meters of lobster farm.

10. Logistics:

We have developed a general model to understand whether a warehouse or a collection through trucks would be suitable for a particular fishing location. The two independent

variables are the fish production at a particular location and the distance of the fishing location from the nearest market.

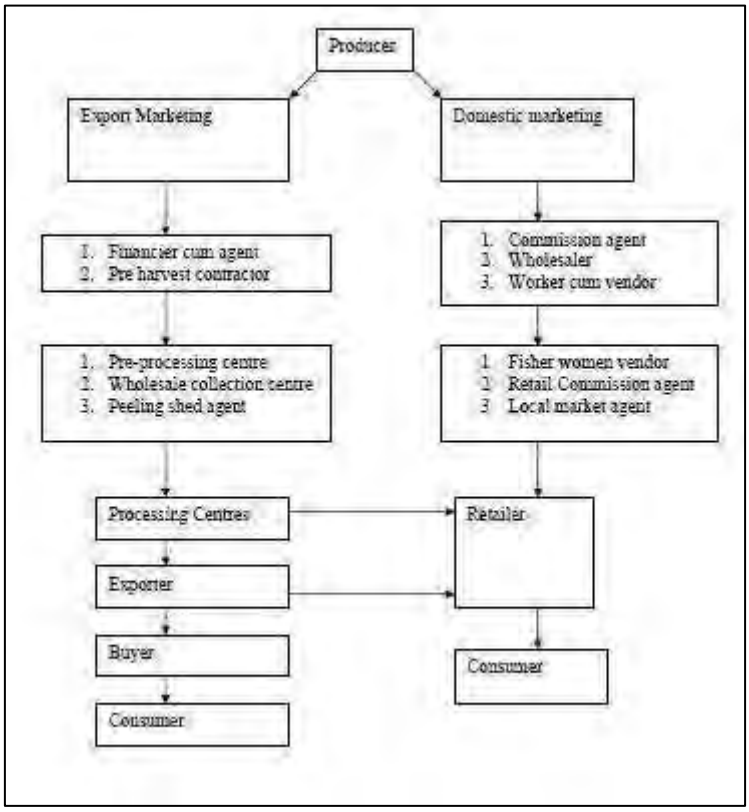
Distance of the nearest targeted market from fishing location

Fish production	Low	High
Low	Lease small warehouse and intermittent collection	Low Profit Area. Reject Region.
High	High Profit Area. Regular collection	Lease large warehouse and Periodic collection

- In areas of low production and low distance from the targeted market, transportation cost for regular collection will be very high. Also, leasing a large warehouse will be costly. Thus we lease a small warehouse and estimate a quantity at which the transportation cost and the cost of leasing the warehouse is justified. When the desired quantity is reached, it is collected intermittently.
- In area of low production and long distances, the cost of transportation will be too high thus enough quantity required justifying the transportation and warehouse cost will be too high, hence in theses area the only feasible option is to sell to intermediaries. Thus it is not profitable to operate in these areas.
- When the fish production is high and the distance from the targeted market is low, transportation cost will be low, thus fish a can be collected on a regular basis and be supplied to these markets. In this case there is no need to lease a warehouse, thus this money can be saved. Our plan will concentrate on the village of Gorai and Manori which are (13,354 tonnes) and have the potential of being high production area with low distance from huge markets like Thane etc.
- In area with high production and long distances, we lease large warehouse and make periodic collection. This is also the case for area with high production but which are difficult to reach. Trucks with high capacity are sent to these locations. By making periodic collection say weekly we save on high transportation cost that would have to be incurred in case of regular collection.

Modayil, Sathiadhas, Gopakumar, 2003, provides the traditional supply chain in the fishing industry.

Figure 4: Traditional Supply Chain in the supply of fish.



The *transport logistic* structure primarily consists of three components:

• The villages Gorai and Manori where the fishing activity will actually take place.

• The warehouse where the fish processing will take place, which contains the cold storage for fish and the information system to monitor the daily demand and prices and any technological updates.

• The Mumbai markets where the fish will be supplied, the hotels, restaurants and canteens which consume seafood and the export centres.

We propose to use a transport system of refrigerated trucks which has the following two important characteristics:

a) Use of Cross Docking system.

b) Use of Milk Run System.

Use of Cross docking System :

Cross docking is a distribution system where items received at the warehouse are not received into stock, but are prepared for shipment to another location or for retail stores. Cross docking can realize a cost reduction by skipping put away and retrieval steps. Using

cross docking to immediately transport the caught fish to the retail market locations or HoReCa's will reduce our costs.

Use of Milk Run System:

Milk Run is a type of round trip system which uses both distribution and collection. Goods, in this case fish will be collected from multiple locations and distributed to one or multiple target locations with minimum handling. Our business model also includes collection of fish waste from the HoReCa's fish markets because there is tremendous potential of processing this waste and converting it to fertilizers, fish feed and inputs to pharmaceutical industry.

A combination of Cross Docking and Milk Run system will help us *reduce our costs* by:

a) Reduce fish handling.

b) Reduce stocks at the supply side and customer side.

c) Improve utilization of the trucks.

d) Reduced transportation costs by 30%.

e) Avoidance of delays.

Fish Processing:

The logistic part also comprises the processing and storage of excess fish at the Warehouse.

Fish processing, like the processing of other food raw materials, should:

- provide a proper form of semi-processed of final product
- assure health safety of products
- apply the most rational raw processing method
- reduce waste to the extent possible
- assure best possible market quality

In order to reduce the bacterial processes, immediately on death fish should be deheaded, gutted, washed and chilled in order to prevent unfavourable enzymatic and microbiological processes. Preservations methods should be applied in order to extend shelf life, if fish is not sold fresh. These could include freezing, smoking, heat treatment (sterilization, pasteurization, etc.). Hence the processing centres should have a cold storage facility.

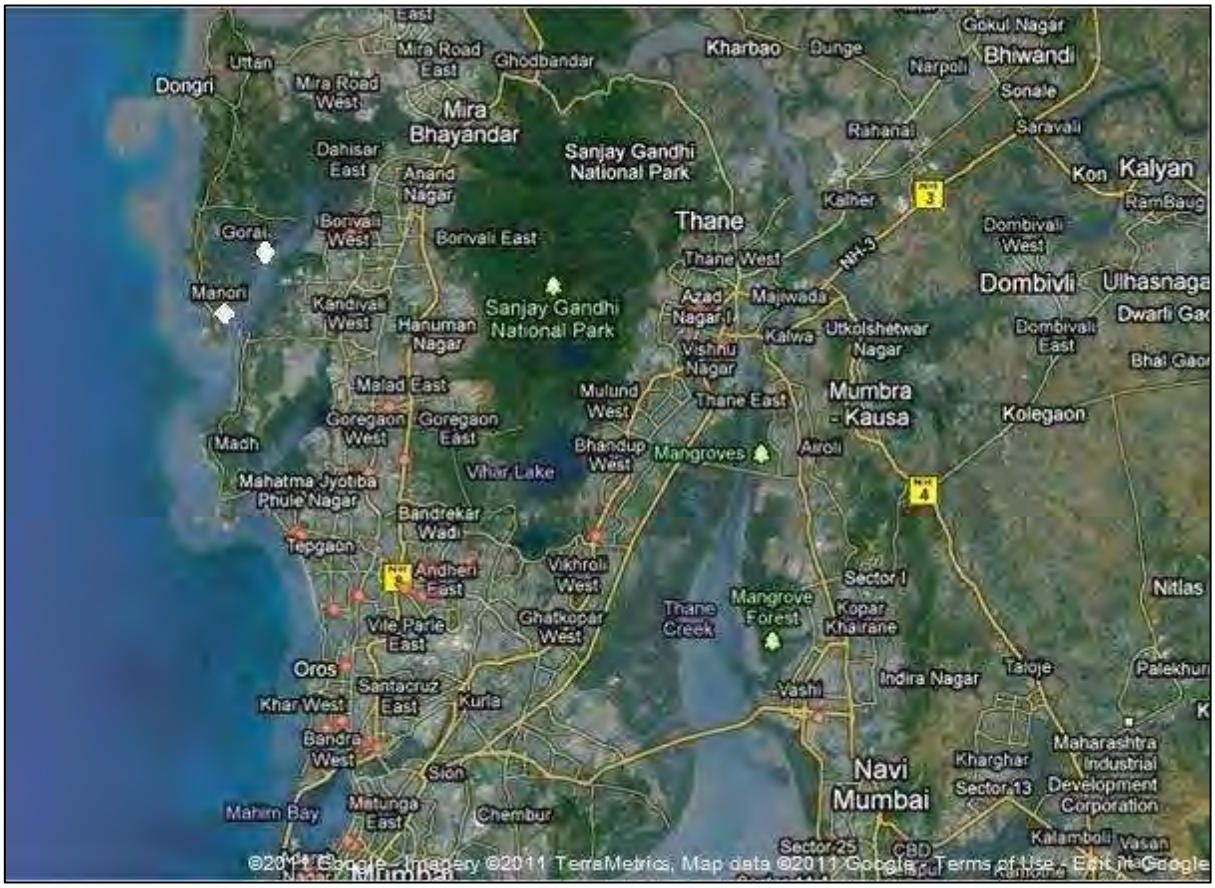
Another aspect of fish processing is to give the product a form which is attractive to the consumer, e.g., skinless fillet or deheaded fish with fins removed. Fish processing must ensure high product quality and extended shelf life. Fresh fish can be stored only for the short time that processing technologies allow for the storage life of fish to be extended without significant loss of quality. Processing must ensure full health safety of fish products and proper sanitary conditions as well as selection of a process (e.g., sterilization,

pasteurization) which render impossible the development of harmful micro-organisms and toxins. High quality products which are safe and satisfy the consumer can be reached by compliance with processing parameters, right from the start of the operation to the distribution of the final product.

Fishing, processing, transportation and sale of fish products are links in a complete processing chain. Each has its own importance but only together can they form an inseparable process to provide the customer with a top quality product.

We propose to have a common warehouse for the processing, canning and storage of fish and lobster for both the supply centres Gorai and Manori. The estimated cost for leasing the warehouse at the estimated supply of fish and lobster is INR 1,00,00,000 per week.

Figure 5: Source to Destination. The white dots on the map indicate our source centres for fish. The red dots are the HoReCa's, one of our primary target markets.



11. Fish Waste Management:

SPECIFIC GUIDELINES FOR ASSESSMENT OF FISH WASTE, OR MATERIAL RESULTING FROM INDUSTRIAL FISH PROCESSING OPERATIONS, reports that fish waste or material resulting from industrial fish processing operations from either wild stocks or aquaculture consists of particles of flesh, skin, bones entrails, shells or liquid stick water. The organic components of the waste have a high biological oxygen demand and, if not managed properly, can pose environmental and health problems.

Our business model proposes to manage this fish waste and utilize it. Fish waste from the fish market can be best utilised in the production of organic fertilizers and composts, which have immense benefits over imported unsterilized organic fertilizers and chemical-based products.

Fish waste can also be used in producing biogas in a process called anaerobic digestion, and is a renewable source of energy rich in methane and carbon dioxide, appropriate for energy production and could help in replacing fossil fuels and can help in the attempts to become carbon neutral.

Anaerobic digestion is the process whereby organic materials breakdown naturally by anaerobic bacteria in the absence of oxygen and produce biogas as waste products. In addition, in the biogas anaerobic digestion process the nutrient-rich solids left after digestion can be used as fertilizer.

The bio-diesel produced from fish waste would be a non-toxic and fully biodegradable renewable fuel that can easily be adapted without any modification to current diesel engines. Bio-diesel is particularly good for the environment as opposed to standard fuel or diesel because it reduces the air toxins, CO2, particulates, black smoke and other hydrocarbons.

Some fish oils contain essential fatty acids like omega 3, which is a highly valued commodity especially in the pharmaceutical industry. Therefore care has to be taken on which types of fish are used when producing the fish oil. One other note of care is the acid content of the oil extracted. For example, salmon oil is high in acid and this acid needs to be removed. Therefore an additional step in removing this acid is required. Sulphuric acid is added to reduce the acid value of the oil.

12. Marketing our Fishery:

The Maharashtra government has decided to promote production, marketing and consumption of fish, as it had earlier promoted the production and consumption of meat, eggs and chicken.

It was decided at a recent cabinet meeting that ‘mahaseer’ (a local fish) would be declared as the ‘State fish’ and its conservation and marketing would be promoted. An amount of Rs 15 crore was earmarked for the purpose.

The cabinet decided to develop ‘peripheral model’ for boosting fish production in the State and 57 ponds had been identified for the purpose. The government would also develop ‘fish markets’. As a company undertaking a fishing business, we may also conduct some promotional activities to encourage the consumption of our fish.

What to promote?

a) Freshness of the fish.

b) Nutritional Benefits of having Fish.

c) Quality of the fish.

d) Types of fish.

e) Interesting Fish Recipes

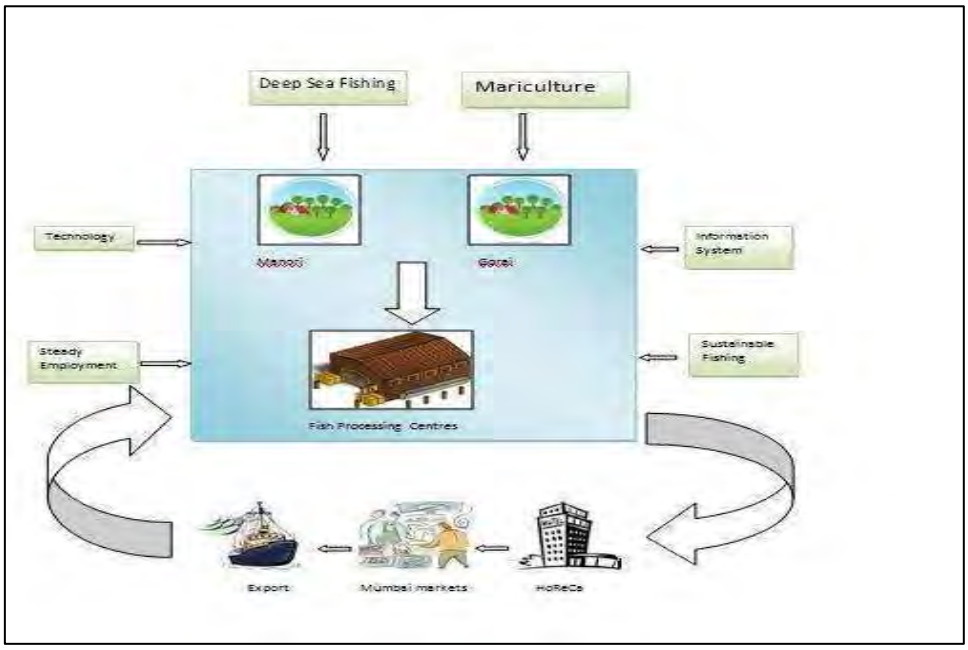
f) Promote fish as a diet food (low fat).

How to promote?

a) Banners on supply trucks.

b) Word of mouth.

13. Diagrammatic Representation of our Business Model:



14. Socio- Economic Benefits of our Inclusive Business Model:

a) *Improved and stable employability of fisherman* – Providing a source of steady employment to villagers in the form of fishing, in the warehouses and waste management. Employment ensures that we as a company have a steady source of fish supply irrespective of the fluctuation of prices and we eliminate all middle men.

b) *Sustainable Fishing*: Training fishermen to use best practices in fishing, such as avoiding overfishing and releasing smaller fish and fish ranching (breeding fish seed and releasing them at younger age).

c*) Improved access to and use of technology and equipment:* Employing the best trawlers and fishing equipment, conducting regular repairs and maintenance. Providing clean water and ice for fish processing.

d) *Establish a health centre to treat diseases and accidents* – Gorai does not have adequate health centres and toilets. Several health issues crop up while handling fish. Fishermen often have accidents while fishing. A portion of our funds will be used to set up health centers to treat these fishermen and women. It is not only an intelligent investment but will also ensure that living standards of the villagers are improved.

e) *Information Systems* – An adequate information system in today's business world is indispensable. Most important uses of the information system would be to consolidate the operations of the different parts of the business, monitor and co-ordinate the daily demand, supply and prices, know the latest trends, technology and practices in fishing.

f) *Fish Waste Management:* Putting to innovative use the fish waste. Fish waste generated from the warehouse and also that collected from the markets can be processed by simple means to convert them to fertilizers and fish feed that will be reused in the business or be used by the villagers.

g) *Clean Water Supply and Lighting* – Clean water supply and lighting not only pursues a social cause but is also a major investment into the business. It ensure quality fish processing and also health of the workers.

h) *Elimination of middle men* – A hoard of middle men in the supply chain of fish,viz, commission agents, wholesalers, retailers etc. Our business model eliminates all these to create a better profit margin for both the fishermen and the business and provides better value to the customer.

i) *Low Opportunity Cost:* The cost analysis has shown that investing the same amount of money even in an alternative plan will not generate similar margins.

j) *Ensuring Quality:* The fishing industry is frequently plagued by hygiene factors such as use of dirty water and ice. Our business model aims to ensure the use of clean water, ice and containers for all purposes. Ensuring this will fetch us a better premium for our fish.

14. Cost and Profit Analysis:

A preliminary cost and profit analysis as done. We have the following key points from the analysis :

a) For the Deep Sea Fishing Business, the working capital per month amounts to INR 4.27 Crores.

b) Revenues for the Deep Sea Fishing Business amounts to INR 5.25 Crores.

c) With a bottom line of INR 97,60,000 per month, we can achieve our break even in 4.5 months approximately.

d) We have included costs for high end technology for the business and social benefits to the village community.

e) The Mariculture business with lobsters, has shown a bottom line of INR 1.4 Crores per annum.

f) The average price of sea food sold at Mumbai has been taken as Rs. 250 per kg. The average selling price for Lobsters has been taken as Rs. 400 per kg.

15. Future Prospects:

a) Expanding the Mariculture Business- To include more varieties of prawns, shrimps, crab, exotic fish.

b) Aquashops – To sell fish seeds, medicines, equipments etc.

c) Expanding to other fishing villages – expanding the model to other fishing villages in coastal Maharashtra.

16. Conclusion:

Through this research, we have successfully designed an all inclusive business model. The model aims to tap an enormous potential lying in the villages of coastal Mumbai. It would help to alleviate the poverty of the fishermen by giving them a steady source of income. It also opens the doors for improved standards of living with health care and sanitation. Access to high end technology and information systems would ensure quality, control and sustainability. The model manages the waste and converts it to useful by products. A sound logistics framework ensures elimination of all middlemen and low costs. With the inherent inclusiveness of the model, we get modest returns to our financial investments.

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