

Understanding Trash Fish Value Chain: A Research on of Fish Oil & Fish Meal (fofm) Plant In Namakkal

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Abstract: *This paper attempts to understand the supply chain of so called discard or trash fish which has an important value creation by the fish meal and fish oil industry serving to aquaculture or animal feed firms. We understand and analyse the process at macro level as well as through a case study of one such plant in Namakkal. Our study, apart from bringing out the nuances of supply chain has also shown the growing importance of so called discard or trash fish.*

Index Terms: *Fishmeal, Supply Chain India, Trash fish.*

I. INTRODUCTION

Trawl fishing is the method of fishing that involves pulling fishing net that is attached to one or more boats. The Low value/Trash fish is resultant of usage of bottom trawls and mid-water trawls. Due to this type of trawl fishing it has a major decremented impact on species being captured and removed from the ecosystem. This method of fishing results in **low value/trash fish** being captured which is later segregated.

The term **low value / trash fish** is generally used to describe a set of fish species with characteristics that are generally classified on the basis of size, preference and little or no commercial value. The catch from the sea/ocean are classified into trash or by-catch based on the country / location. The trash fish are basically categorized into two types namely Retained and Discards. These retained categories of fish have got several applications. The usage generally vary, namely for Human food, Livestock/ fish food and Fertilizers.

The trash fish is basically considered to be of low value because of the fact that they are usually are recognized under low economic value, generally small in size and has a low customer preference.

With that said, the trash fish definitely plays an important role in this trash fish economy because of the presence of high protein value and quality when these fish are caught. There are several utilization potential for this class of trash fish, which finds its importance in the industries for Fish sauce, Direct Human Food, Livestock Feed and Aquaculture feed.

With the aid of these usage and categorizations, thereby the trash fish economy plays a major role in Aquaculture. In addition to this, the exists an important role of environmental impacts that are larger issue that has to be tackled with due to the fact that bottom trawling methods have raised an alarming concern that in order to get access to a good supply of shrimp or prawns, it is seen in various studies conducted that in general for the value of 19 metric

tonnes of shrimp, approximately 76 to 190 metric tons of other marine life is discarded [3].

This culture of trawl fishing dates back to years , but during the years of 1960s , the concept of trawl fishing was encouraged especially in the regions of Bay of Bengal and later tilted as “Pink gold rush”[2], but as stated earlier along with the pink gold , other ,marine animals were also fished out as the nets or gears used in the bottom trawling , disturbed the marine ecology like the coral Reefs , turtles , sea snakes , juveniles , during causing or tampering the marine ecology to a larger extent .

The role of the fish meal is justified by the fact that the applications as stated earlier are utilized in the chicken feed and fish feed cultures.

II. OBJECTIVE

Analyse the Trash fish economy and value chain analysis. This is done with respect to:

1. Analyzing the secondary data on FAFO production, exports and imports for India based on secondary data
2. Understanding the value chain through case study poultry feed plant in Namakkal.

III. RELATED LITERATURE

The trash fish terminology is raised because of the fact that every catch in the sea is always valued on the basis of two dimensions i.e. on weight and value of the fish. The trash fish is a resultant of trawling. There are various types of trash fish and their composition is basically dependent on the factors like fishing area and the type of gear used. In order to analyse the trash fish value chain it is important to categorize the trawl catch in to three categories: Target, Bycatch and Discards.

The Target category basically deals with the fact that these fishes have very high value and they are primarily destined for export markets. The Bycatch is again classified into two kinds: Commercial Bycatch and trash fish [1].

The Bycatch is basically sold for human consumption usually by general markets, meanwhile the trash fish as stated earlier they are generally the low value fish and they are generally used for fish meal manufacturing .Lastly, the discards are generally the animal materials that are thrown away at sea [2].

Revised Manuscript Received on July 11, 2019.

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Retrieval Number: I8998078919/19©BEIESP
DOI:10.35940/ijitee.I8998.078919

IV. CONCEPTUAL MODEL OF TRASH FISH VALUE CHAIN

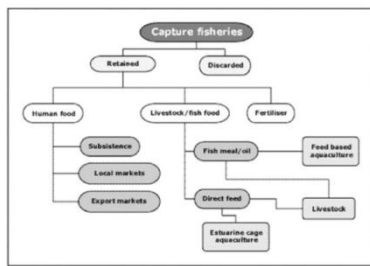


Figure 1: Fish Meal Distribution [1]

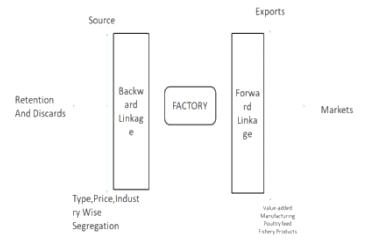


Figure 2: Linkage for Fish Value chain Analysis.

As observed from the conceptual models regarding the trash fish value chain analysis. The Backward Linkage of this value chain brings out the facts of the Fishing out the Resources at the Sources using various trawls and the aspect of retention and discards the trash fishes and the third part to segregate the fishes based upon the type, price and industry wise application. And then the next process in this whole phenomenon is the processing of fish at the factory or any other level and then the last aspect of the model is to convert these processed fish into Value added manufacturing, animal feeds, human consumptions followed by marketing it in domestic and international markets.

In addition to this the linkages enable to bring out key facts that how various dimensions play an important role in the culture of fishing and fish meals productions and Resultant products .The Dimensions that are evident are: Geographical aspects, what type of fish is best suited, processed at factory levels and then this processed fish are given out to the markets in categorization on the basis of type and different geographical regions based on the demand and supply aspect.

V. METHODS AND MATERIALS

In order to bring out the key essence of the work, the areas to study is identifies and in order to achieve this study was conducted at Namakkal and thus motivation to study this area is due to the strong presence of poultry culture present in this geographical dimensions. The Namakkal study based on Qualitative methodology to get the concepts clear using questionnaires

VI. RESULTS & DISCUSSIONS

In the context of Fish meal production and Trend Based on FAO data, brings out various factors regarding the whole scenarios of fish meals and the fishing industry.

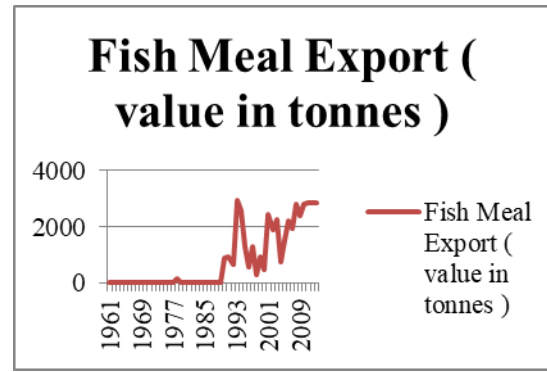


Figure 3: Fish meal Exports

The Figure 3 shows the Fish meal export quantity, which brings out the facts that there is a positive trend that is given out over the years and the dependence on Fish meals by various industries like poultry, etc, where X-axis is year and Y-axis is the value in tons.

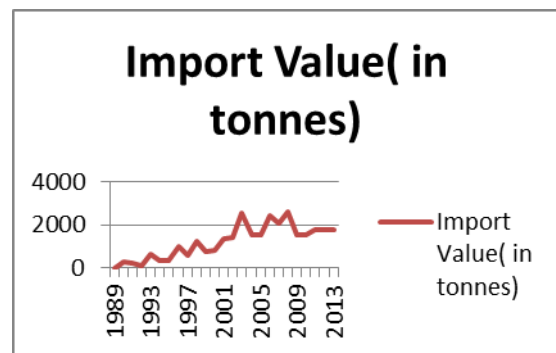


Figure 4: Fish Meal Imports

The figure 4 brings out the fact regarding import value of fish meals with increasing number of industries dependent on these bottom trawl fishing methodologies, where X-axis is year and Y-axis Fish meal import value in tonnes.

The core objective of this paper can be analysed using various data available to give out conclusive statements.

The demographic data regarding the coastal areas is as follows:

The population around the coastal areas of India is around 7 Billion, covering over 8100 km, which is mainly dependent on fishing for their livelihood. It is often observed that the search for fish ends in pending certain amount of time and resources thus increase in cost leading to low profitability. A reliable and timely advice of potential zones of Fishing aggregation leads to benefiting the fishing community to reduce the time and effort spent in search of shoals of fish, thereby increasing profitability and therefore, impact the Socio-economic status.

The ability to use the remote sensing data and its application in the management of coastal oceans and to devise methodologies to utilize these data to harvest food from sea. This leads to development of a technique that utilizing remotely sensed sea surface temperature (SST); objective is to identify locations of fish aggregation. It is also aiding factor in the demarcation of Potential Fishing Zone.



The, ability to divide the whole ocean areas into 14 sectors- Gujarat, Maharashtra, Goa , Karnataka, Kerala, South Tamil Nadu, South Andhra Pradesh, Orissa , West Bengal , Lakshadweep Islands , Andaman and Nicobar Islands. The Potential Fishing Zones map consists of information regarding the major landing centres, bathymetry and the Location of PFZ (longitude and longitude). There are also 586 landing centres available in order to enhance the possibility of change of these fishing sites, so therefore, this acts a guide to fishermen on the factors such as probable shifts in PFZ, wind speeds and direction information[4].

A. Characteristics and Functioning of Fish Meal Industry

Fish Meal Process Flow consists of various processes which can be seen as follows:

To understand the whole concept surrounding the Fish meal is necessary to understand what Fish meal is. Fish Meal is defined as a product obtained by drying and grinding or treatment of fish and fish waste to which no other additions are made. The Fish meal is always characterised due to the fact that the products should contain no more than 6 Percent Oil and not more than 4 percent salt. This fish meal is generally Converted into powder form and commercialized usage in the compound foods for poultry, pigs and farmed fish.

There are several points that have to be kept in mind when selecting species for industrial fishery:

- The Species must have a large concentration to give a high catch rate which implies upon the fact that value of this fish is trash, unfit for human consumption.
- The catch should comprise of various type of fish in order to not hamper the supply rate.
- The total Availability of long lived species varies from year to year
- The species containing more fat is more valued because it's rich in the protein aspect of fish meals.

These Fish gathered is usually processed in various ways, the simplest method of processing this fish meal in Drying in the sun. The plant processing of this fish meal in done in the following methodology:

a. Cooking

In this process the fish is cooked and the protein is coagulated, removing most of the water and oils present. A commercial cooker consisting of long steam jacketed cylinders through which the fish is processed in order to get the desired qualities of cook of the fish in order to extract the oils and water at later stage.

b. Pressing

This process is mainly focussed to remove the oil and water content present in the fish. With this process the water content is reduced to around 50 percent and around 4 percent.

c. Press Liquor

This process aims at removal of course pieces of solid material; the liquid from the presses is continuously centrifuged to remove the oils. these oils are further refined to a process of final centrifuge and process of polishing is conducted and stored in storage tanks , this oils are valuable and utilized in the manufacturing of edible oils and fats , ex margarine.

The remaining water portion in the fish, brought down close to around 9 percent in weight.

d. Drying

In this process the fish is dried to its desired qualities, as the fact lies that if the fish meal is under dried, moulds or bacteria may grow, if it is over dried, and then there can be a loss in nutritional value of the meal.

e. Grinding and Bagging

The final operation of grinding is to break down any lumps and practices of bones and then packaging them into bags.

So therefore, from the fish meal factory, the meal is transported to animal food compounder and from there to the farm.

From this process on, the aspect of Storage and transport is to be analysed. In order to ensure that there is no further contamination of fish meals it is usually stored in sacks made of paper, plastics. In few cases, fish meal is also pelletized to make mechanical handling easier.

B. Findings

The findings were based out of survey conducted at Namakkal. The objective is to understand the whole process and the steps defined in the process to analyse are:

1. Procurement Process
2. Production/ processing Phase
3. Selling Activation

The **First stage** is about key findings regarding fisheries source based out of Namakkal, and their various suppliers from Kudlur, Nagapatnam and Bhatkal. The type of fish that is procured is mixed type of fish and there is no involvement of third party agents which shows direct supply relationship towards procurement .The logistics involves the roadways as the only source for transportation and the payment mode for all these consignments are cash transactions. Now, looking at the composition of the fish in terms of size: they are usually small fish but the differentiation lies in the presence of salt / no-salt, oil content and sand moisture of the whole consignment of fish delivered .So with these the aspects of seasonality of being a major concern, it is observed that is not a constant supply, but gives out the presence of buffer storage type of system to address the supply related concerns for any business.

The **second Phase** involves the production/processing phase:

This phase brings out various observations .The raw materials in the procurement phase brings out the fact that the capacity needed for production is around 300 tons/month and the effective utilization is around 150-200 tons /month which brings out the aspect of buffer storage management of supply . So in order to process this capacity of supply, the process is carried out with the aid of Local machinery and the reason why Namakkal is preferred choice for processing the fish is due the strong presence of poultry industry .So what are the various functions involved in this phase is as follows:

- Fish segregation
- Grinding
- Powdering

These functions are achieved with the aid of multiple machinery available to not hamper the production rate.

The labour force behind achieving this task is usually a workforce close to 40 employees, the work sometimes becomes strenuous so thereby a usual preference of male employees but there is no restrictions towards achieving this goal of uninterrupted production.

The wage for these employees is on a daily basis, which is an equal pay structure and by cash .it also gives out the strong presence of migrant employees in this sector.

The **Last Phase** is looking out at the selling activation function:

For any plant to generate profits and the various outputs generated by these fisheries industry.

They give out the fact in this particular fishery is that the main type of output is only fish powders and the buyers are the local poultry farms present around the fishery and to analyse the presence of branding it is self-promotional activity in this case . So in order to increase the presence of this fishery existence to generate profits there is aspect of exporting these produce and the country it exports to is Bangladesh. With all these findings, there is the aspect of riskiness involved to establish a new fishery which is at least risk and there is dependent dependency for actions being taken in situation of demand surge.

VII.CONCLUSION

The objective of this paper was to get the facts regarding the aspects of Supply chain of Trash Fish by adopting a case study methodology of being able to generate knowledge and data from various sources. the key findings regarding this Trash Fish Value Analysis , is analysis of trends of Quantity based data and also see the variation's that are resultant of changes in demand and supply , which is dependent upon various environmental factors , economical factors.

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