

## **Fish waste to priceless asset a survey of fish waste from fish markets of Nanded city, Nanded (MS) India**

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### **ABSTRACT**

The amount of fish waste produced worldwide has increased dramatically. Significant economic and environmental issues are raised by the estimated two-thirds of fish that are thrown away as garbage. Therefore, the disposal and recycling of these wastes have become a key issue that must be addressed. India stood 02 position in inland fish production and the waste from fish was also in huge quantity, the use of discarded fish waste can be a sustainable strategy for implementing a circular bioeconomy, where valuable additional materials are produced. In this study, we highlighted the generation of fish waste from fish market in Nanded city and the huge role that fish waste can play in the socio-economic sector. During our study from October 2022 to September 2023, it was recorded that the amount of fish waste were huge in the months of October 22, November 22, December 22, June 2023 and September 23.

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Figure : 01

References : 07

Table : 01

KEY WORDS : Fish markets, Fish waste, Marathwada, Nanded.

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### **Introduction**

Regular fish waste from the fish market is becoming dangerous for the environment day by day. The disposal of waste from this market is not done properly. This waste is thrown anywhere else. We can make various types of products from the waste of these fishes. That is, from waste to sustainable. Fish litter has been a problem for the past few years. This is not a local problem but it is a matter of concern at the global level. Fish waste is the part from the fish that is thrown away. Again, there are some fish that have very little demand in the market or they are perishable by the time they reach the market, such fish are thrown away. Fish waste, including fish fins, heads, scales, and the digestive tract, this is what we call fish waste.

About 20 to 25 million tons of fish waste are produced globally each year, which accounts for 25% of total marine fish catch. In many places, this fish waste is dumped into the ocean, threatening the marine web ecosystem. Even the waste from fish market is not disposed properly. So we have to find an environment friendly method to stop the pollution from this waste. Fish and fish oils are also a balanced source of protein

components and essential fatty acids contents in human diets<sup>4</sup>.

This eco-friendly material should be easily decomposed in nature and its component material should be able to be reused in nature. For example, you can make an excellent organic fertilizer from fish waste. We know the environment is also affected by these waste, so if we prepare organic manure from fish waste then by using this fertilizer instead of chemical fertilizer fertility of soil may also increase.

In this article, authors explained the fish waste byproducts including Gelatin and collagen, a potentially useful substance for use as an addition in yogurts and creams, have been extracted from the skins, fins, and scales of marine animals. Omega-3 capsules for the pharmaceutical business have been examined for their potential to be produced from polyunsaturated fatty acids and other fat-soluble vitamins found in the head and viscera of the fish. Additionally, fish are a potential source of the carotenoid astaxanthin, which has strong antioxidant qualities. Utilizing combination approaches, such as chemical and enzymatic procedures, can reduce the amount of environmentally harmful substances while

**TABLE -1 : Fish waste generated during Oct 2022 to Sept. 2023 from Nanded fish markets**

<b>Fish Market</b>	<b>F M –A</b>	<b>F M –B</b>	<b>F M –C</b>	<b>F M –D</b>	<b>Average</b>
<b>Month</b>	<b>Waste in Kg</b>	<b>Waste in Kg</b>	<b>Waste in Kg</b>	<b>Waste in Kg</b>	<b>Waste in kg</b>
Oct-22	140	90	70	60	<b>90</b>
Nov-22	190	80	85	55	<b>102.5</b>
Dec-22	210	75	110	30	<b>106.25</b>
Jan-23	80	28	38	24	<b>42.5</b>
Feb-23	95	30	24	28	<b>44.25</b>
Mar-23	52	22	16	8	<b>24.5</b>
Apr-23	35	10	16	26	<b>21.75</b>
May-23	<b>10</b>	<b>8</b>	<b>12</b>	<b>10</b>	<b>10</b>
Jun-23	<b>230</b>	<b>110</b>	<b>180</b>	<b>120</b>	<b>160</b>
Jul-23	30	12	10	13	<b>16.25</b>
Aug-23	28	16	12	11	<b>16.75</b>
Sep-23	120	35	40	26	<b>55.25</b>
<b>Total</b>	<b>1220</b>	<b>516</b>	<b>613</b>	<b>391</b>	<b>685</b>

**Abbreviations : FM-A - Taroda Naka, FM-B - Gokul Nagar, FM-C - Itwara Fish Market, FM-D - Naik Chowk**

also improving the extraction yield and yielding more pure molecules<sup>2</sup>.

In the last few years, biotechnological procedures like fermentation and biocatalysis have become a crucial component of the processing of seafood; they are useful for recovering different valuable components from the fish wastes of the processing of seafood and offer an appealing substitute for mechanical, chemical, and physical procedures<sup>7</sup>. By-products or waste from fish processing have a lot of potential uses. With the right tools and the most recent developments in technology, it is feasible to extract the bioactive compounds and components<sup>6</sup>. Preparation of organic fertilizer from fish

waste is also very ecofriendly by- product as this organic fertilizer is rich in NPK and the key nutrients found in organic fertilizer are potassium (K), phosphorous (P), and nitrogen (N), which are micro- and macroelements necessary for the growth of both plants and animals. By producing a workable product, composting solves the disposal issue, decreases the possibility of surface and groundwater fouling and is a pollution-free procedure. Fly larvae and pathogens are destroyed by composting. Composting is an inexpensive way to get rid of fish waste when you compare it to other alternatives. Fish growers or dealers who discard their fish waste may find value in turning it into organic manure. By selling the manure

and making money, we may create jobs if we dispose of it properly so that it decomposes. For farmers practicing organic farming, this waste can be a valuable source of NPK production<sup>1,3</sup>.

In present MS We collected the information on amount of fish waste generated from fish markets in a year.

### Materials and Methods

For this study four fish markets were selected in Nanded city. They are Wednesday fish market-Taroda Naka (FM-A) Latitude: 19.1842° N and Longitude: 77.301° E, Friday fish market- Gokul Nagar (FM-B) Latitude: 19.1604° N and Longitude: 77.3145° E, Sunday fish market- Itwara (FM-C) Latitude:19.1484° N, and Longitude 77.3273° E and Daily fish market- Naik Chowk (FM-D) Latitude:19.1739° N and Longitude 77.3217° E.

This study was conducted during Oct 2022 to Sept. 2023 from Nanded fish markets.

The information regarding the waste was collected from fish sellers through direct interviews.

The waste was measured in kg.

### Result and Discussion

Nanded city is one of the important city in Marathwada region. Godavari river flows through Nanded city. Many people from this city preferred fishes in their diet. Finding of present investigation was described in Table No 1 and Graph. Wednesday fish market-Taroda Naka (FM-A) was a big fish market, near about 25+ shops were present in this market. As per our survey, in the month of June 2023 all fish markets were produced huge amount of fish waste. In the month of June 2023 FM-A produced 230 Kg fish waste, then FM-C generated 180Kg, FM- B 110 Kg and FM-D 120Kg (Table No.1). FM-D situated near to Naik Chowk and this place daily fishes were sold out. As per the data it was recorded that FM-A *i.e.* Wednesday fish market at Taroda Naka having very huge amount of fish waste in a year. Near about 1220 Kg fish waste was calculated by us during the study period. It was also found that in this market along with fresh water fishes marine water fishes were also sold out. Pomfret, Oil sardine, Indian mackerel, shrimps *etc* sea food recorded. FM- C Itwara fish market produced near about 613 Kg fish waste in a year. In FM- B weekly market at Gokul Nagar 516 Kg fish waste recorded whereas In FM- D Naik Chowk it was 391 Kg. FM-D as it was daily fish market only 3-4 fish sellers sale their fishes, when we interviewd them for the fish waste one of the fish seller told that, he decomposed this waste in his farm. In the month of May 2023, due to decrease in water level or many water

bodies get empty so very few shops were observed in all markets and the fish waste was also recorded in very low quantity.

When we calculated all the four fish markets in context with fish waste, 2740 Kg waste was recorded. If this type of fish waste is generated every year, then this waste should be recycled for many by - products.

Present Uses of Spoiled Fish and Fish Waste

#### Fish Meal

Fish meal, which is unfit for human eating, is a dry powder made from fish filleting wastes or entire fish. There are six phases involved in making fish meal: heating, pressing, separating, evaporating, drying, and grinding. The protein in the fish coagulates and ruptures the fat deposits when it is cooked. This releases water and oil. After that, the fish is squeezed to extract a significant amount of liquid from the raw material. The aquaculture sector currently consumes 63% of fish meal, followed by pigs (25%), poultry (8%), and other animals (4%)<sup>2</sup>.

#### Fish Oil and Application

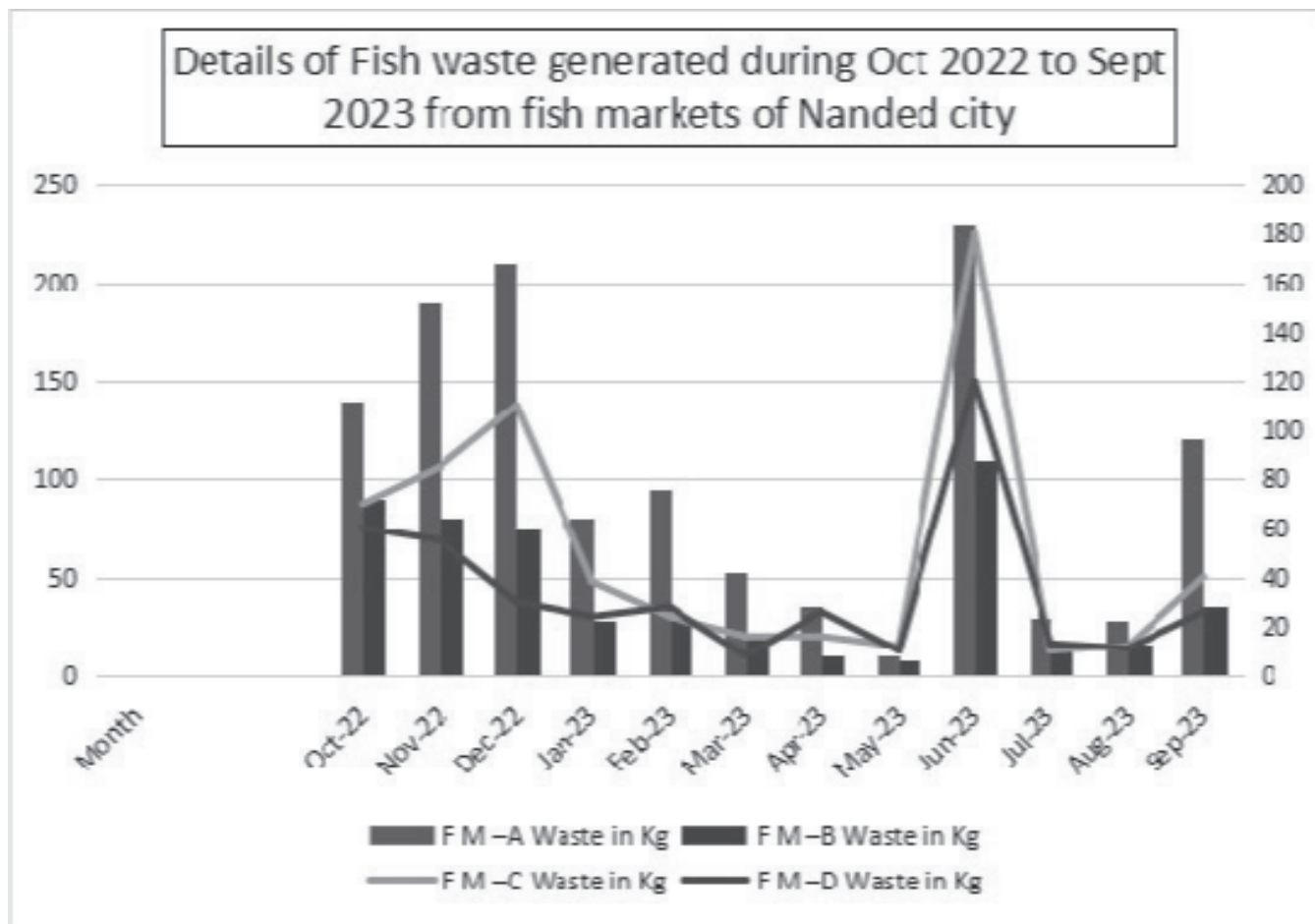
Long chain polyunsaturated fatty acids, or omega-3 fatty acids, are easily obtained from fish oils. These fatty acids are primarily made up of cis-5,8,11,14,17-icosapentaenoic acid (EPA) and cis-4,7,10,13,16,19-docosahexaenoic acid (DHA). Numerous advantageous bioactivities of omega-3 fatty acids include preventing atherosclerosis, guarding against arrhythmias, lowering blood pressure, helping diabetic patients, preventing manic depressive illness, reducing asthmatic symptoms, preventing chronic obstructive pulmonary diseases, easing cystic fibrosis symptoms, increasing cancer patient survival, lowering cardiovascular disease, and enhancing cognitive function<sup>2</sup>.

#### Fish Silage

For animal feeding, fish silage is a great source of protein with strong biological qualities. Fish silage is a liquid product manufactured from entire fish or fish pieces that have been acid-treated to cause the fish's enzymes to liquefy. Fish byproducts from marine fish, rotten fish, underutilized species, commercial fish trash, and industrial wastes from the filleting industry can all be used to make fish silage. The fish silage is the most readily available source of amino acids for protein biosynthesis because the proteins in it may hydrolyze to release free amino acids<sup>2</sup>.

#### Organic fertilizer from fish waste

Fish waste composting has a long history. One great way to recycle organic waste for potential use in contemporary agriculture is by composting. The process



**Fig. 1 : Fish waste generated during Oct 2022 to Sept. 2023 from Nanded fish markets**

of converting various organic waste materials into compost is considered environmentally beneficial and offers both economic and ecological benefits. Fish vendors only need to set up a pit and tend to it until the waste begins to break down. It is necessary to create multiple layers of fish waste. The first layer comprises the digestive system, scales, fins, gills, kidney, liver, air bladder, testis, ovary, and other waste organs. Sawdust or another wood product should be the following layer to serve as a carbon source. When placing fish waste in a pit, you must be careful for the first seven days because the pit smells terrible at this time, increasing the possibility that dogs, cats, or other predators will disrupt the pit. Monthly pit checks are required. An excellent fertilizer was produced in 180 days<sup>3</sup>.

**Conclusion**

Fish waste management is an appealing topic because it indicates a potential solution to the environmental implications of fishery discards while also providing a mechanism to exploit them as a source of feed for farmed fish, so promoting future aquaculture expansion in a sustainable manner. The use of fisheries wastes and byproducts has the potential to eliminate

wastes that would otherwise be dumped, resulting in nutrient enrichment and water eutrophication. Fishery wastes and byproducts are a valuable source of high-value chemicals; nevertheless, possible dangers associated with the presence of pollutants must be considered before their use.

We just consider fish size, which is extremely unimportant to us as humans but important to the ocean and ecosystem. Small garbage from every person contributes to an endless amount of unregulated and untraceable waste. High-quality fish waste composting provides marketable value as an organic fertilizer, thereby increasing extra revenue opportunities. Furthermore, it contributes to the reduction of waste from recyclable raw ingredients by returning nutrients to agriculture. Because of all of these benefits, fish waste compost can be used as a soil amendment and fertilizer supplement in farms, gardens, vegetable production, field crops, trees, and landscapes to increase soil organic matter and nutrients, promote moisture holding ability, and ultimately improve production and quality.

**Following points must be thought by an individual who think about fish waste which is priceless asset.**

- ❖ Raising consumer awareness of eco-friendly fish waste management techniques.
- ❖ Using fish waste to create products with added value.
- ❖ An increasing emphasis on circular economy concepts.
- ❖ The market is growing for organic and natural fertilizers.
- ❖ Waste-to-energy technological advancements.
- ❖ Fish waste recycling is gaining popularity because of new methods.
- ❖ Investigating fish waste alternative uses in the nutraceutical and pharmaceutical industries.
- ❖ Sponsoring campaigns to increase public knowledge of the correct disposal of fish waste.
- ❖ An increasing number of consumers are choosing pet food made with natural and wholesome ingredients.

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