



Full Length Research Article

SCOPE FOR TUNA FISHERIES IN INDIAN MARKETING SYSTEM

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Accepted 24th December 2014; Published Online 30th January 2015

ABSTRACT

This paper attempts to describe the scope of tuna processing and marketing in India especially as a small scale business venture. Tuna, commonly known as chicken of the sea is the third largest internationally traded fish commodity, which contributes about 7.6 per cent of the total trade in value terms. The Indian EEZ alone has a resource potential of 0.21 million tonnes of tuna, of which the present exploitation is only around 0.05 million tonnes. Exploitation of tuna resources is identified as one of the thrust areas for increasing export of Indian marine products. Tuna product forms exported from India include mainly frozen, dried, chilled and canned items. The tuna processing industry has grown very rapidly in the last decade with a due domestic market share also. The other value added tuna products include barbecued tuna, seasoned tuna cubes, pickled tuna, tuna jerky, tuna biriyani, tuna paste and tuna shavings. The cost and return analysis in tuna processing assures a reasonable profit, and the break even quantity assessed is also found to be very much below the practically achievable quantity. Hence, the tuna processing venture could be a potential and productive option for the unemployed youths and performing SHGs. Encouraging potential clients to take up the venture, would also aid for effective utilization of a so far underutilized tuna resource.

Key words: Fisheries, Marketing system.

INTRODUCTION

Tuna, commonly known as chicken of the sea is the fourth major fish commodity traded internationally after shrimp, salmon/ trout and ground fish. It constitutes, 7.6 percent of the international fish trade in value terms. In recent years, tuna has become more than just a basic food item. It's high nutritional value has led to increased consumption and popularity, especially with the opening of sushi bars in major cities worldwide. Because of its taste, texture and versatility, tuna is enjoyed around the world and served under many different names as listed below.

• Dutch	—• Greek	—• Russian	—
Tonijn	Tovoc	Tyheli	
• French	—• Italian	—• Spanish	—
Thon	Tonno	Atun	
• German	—• Portuguese	—• Swedish	—
Thunfisch	Atum	Tonfish.	

A Brief Historical Background

Tuna has been fished from the warm, temperate parts of the Mediterranean Sea and the Pacific, Atlantic, and Indian Oceans since ancient times. People have been enjoying tuna as a food ever since time immemorial. Fresh tuna has been enjoyed by coastal populations throughout history. Smoked and pickled tuna was widely consumed since ancient times. In traditional Japanese and Taiwanese communities, tuna has formed a major part of their diet and subsistence for over 1000 years.

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Since 1950s, Japan and Taiwan have been the biggest fresh and chilled tuna producers and consumers in the world, defeating traditional counterparts in Western Europe where tuna has been traded commercially from as early as the 18th century. However, in the last 25 years, the United States has become the world's leading market for canned tuna production and consumption. Japan and the United States consume about 36 percent and 31 percent, respectively, of the world's catch. However, the global trend and market for tuna is evolving. Traditional monopolies are constantly challenged and new markets are fast emerging. We have new markets rising in the Middle East and China. With the advent of technology and better scientific knowledge of tuna stock, preservation, migration and breeding patterns, new alternative fishing grounds can also be studied and tapped. Better infrastructure and development plans, coupled with more efficient port management and operations, are needed in ports.

Etymological Background

The word 'tuna' dates back to 1880 in print and its origin is attributed to Spanish American derivation of the English counterpart, tunny. The word tunny apparently originated from the Latin Thunnus, the name of its scientific genus.

Commercial Tuna Varieties

Tuna is regarded as one of the world's most valuable commercial species. It is fished in over 70 countries worldwide, and marketed in fresh, frozen, or canned form. Depending on the variety, fresh tuna is available seasonally - generally beginning in late spring and continuing into early fall. Frozen tuna is available year-round and is sold in both steaks and fillets.

The most important commercial species include:

- **Albacore:** A high-fat variety, rich in omega-3 fatty acids, the albacore has the lightest flesh, white with a hint of pink, and is the only tuna that can be called white. Its mild flavor and prized white flesh make it the most expensive canned tuna.
- **Yellowfin:** Also called ahi, the yellowfin tuna is usually larger than albacore, reaching up to 300 pounds. Their flesh is pale pink and must be called "light", with a flavor slightly stronger than albacore.
- **Bluefin:** Among the largest tunas are the bluefin, which can weigh over 1,000 pounds. Young bluefins have a lighter flesh and are milder in flavor. As they grow into adulthood, their flesh turns dark red and their flavor becomes more pronounced. Bluefin tuna is used in sushi and sashimi and is not canned.
- **Skipjack:** Similar in flesh to the yellowfin, skipjack can weigh up to 40 pounds but typically range from 6 to 8 pounds. The fish get their name because of their lively movement in the water, where they seem to skip along the surface. Also known as arctic bonito, oceanic bonito, watermelon and, in Hawaii, aku, Skipjack is the most commonly canned fish on the market today.
- **Bigeye:** Known in Hawaii as ahi, bigeye tuna are similar in general appearance to yellowfin tuna and are the deepest ranging of all tuna species, with a range of greatest concentration at 150 to 250 fathoms. With its mild flavor and desirable fat content, the bigeye is often used in canned tuna.

Health and Nutritional Aspect

Tuna is an affordable, great-tasting and versatile pantry staple with a wealth of health benefits. Preparing meals and snacks with canned or pouched tuna is a simple way to replace foods high in saturated and trans fats, and ensures one is getting the recommended 12 ounces of seafood per week. Tuna is an excellent source of niacin, selenium, and protein. It is also a very good source of vitamin B6 and thiamin. In addition, it is a good source of omega-3 fatty acids, phosphorus, potassium, and magnesium. However, tuna has more to offer than just great taste and nutrition. Tuna can also help lower blood pressure and cholesterol. The omega-3 fatty acids - found in abundance in fatty fish like tuna - can help lower the risk of heart disease, ease the pain of arthritis, reduce asthma complications, and is essential in the growth and development of young children.

Where Tuna Are Harvested

Although tuna is found in all major bodies of water except the polar seas, the majority of the tuna supply comes from the Pacific Ocean - which accounts for 2.3 million tons or about 66 percent of the total world catch. The rest of the commercial tuna sold around the world comes from the Indian Ocean (20.7 percent), the Atlantic Ocean (12.5 percent) and the Mediterranean and Black Seas (0.8 percent). The Indian EEZ alone has a resource potential of 0.21 million tonnes. Exploitation of tuna resources is identified as one of the thrust areas for increasing export of Indian marine products. State-wise the contribution is mainly by Kerala (42%) followed by Tamil Nadu (17%), Gujarat (11%) and Andhra Pradesh (10%).

Along the east coast, the major contributor to the tuna landings is Tamil Nadu (63%) followed by Andhra Pradesh (29%) and the other states contributing 7%. On the west coast, the contribution is highest by Kerala (59%) followed by Gujarat (16%), Maharashtra (12%), Goa (7%) and Karnataka (5%).

Tuna Export Market Potential

Tuna is considered a potential export resource in India. We export tuna products to southeast and West Asia. The European Union, Japan and the U.S. have shown interest in importing the fish. Tuna products in different forms viz., frozen, dried, chilled and canned are exported from India (Table 1). During the year 2007 – 08 India exported 34947 tonnes of tuna valued at Rs. 2110.12 million. The major product is frozen tuna with a quantity of 34049 tonnes (97.43%) valued at Rs. 1978.41 million (93.76%). The contribution of India to the tuna export trade is only nominal and the exports are mostly in the frozen form for use in the canneries. In the last couple of years a lot of effort has been made towards the development of the long line fishery and there has been an increase in the chilled and canned tuna export from India. India has also been obtaining very good prices in the Japanese market.

Table 1. Tuna Export from India (2007 – 08)

Product form	Quantity (Tonnes)	Values (Rs. million)	USD, million
Frozen	34049	1978.41	49.17
Dried	27	6.95	0.17
Chilled	553	88.54	2.23
Canned	318	36.22	0.90
Total	34947	2110.12	52.47

Source: MPEDA, Cochin

With the objective of increasing tuna based export earning to USD 500 million by the end of XI Plan period a number of new projects and schemes have been envisaged. There has been stagnation in the total catches of tuna in the global scenario. However, it is anticipated that the contribution by India is set to increase rapidly with the implementation of various schemes and introduction of well-equipped tuna fishing vessels. It is also expected that value added product forms would form a significant proportion of export, instead of the traditional frozen form. The export are projected to reach US\$1000 million by the year 2020.

Tuna Domestic Market Potential

Tuna apart from fresh consumption, in recent years, grabs a very prominent share among the value added sea food products, with the urban consumer of India. Canned tuna, smoked tuna and dried tuna are able find a prominent place in the showcases of super market of major cities and towns. Other value added products like Tuna masmin, Tuna burger, Tuna finger, Tuna steaks, Tuna croque, Tuna biriyani are treated as attractive sea food dishes in all restaurants.

Tuna Processing as a Business Venture

Apart from the expanding export opportunities, it is evidently true that there exists a very wider and scopeful domestic market potential for the valued added products of Tuna, in

India. This trend brings in the Tuna processing venture to lime light as a potential business opportunity with an onward scope. The value added products of Tuna include,

- Tuna steaks in cans
- Tuna steaks in retortable pouches.
- Smoked tuna
- Dried tuna
- Masmin

The other value added tuna products are Barbecued tuna, seasoned tuna cubes, tuna pickles, tuna jerky, tuna biriyani, tuna paste and tuna shavings. The various options available in tuna processing is plenty where as the level of exploitation is perceived to be very minimal, so far.

Canned Tuna Products

Canning is one of the several methods employed for preservation of wide range of food including fish. Preservation by canning is achieved by controlling or preventing the micro-organisms responsible for spoilage. Canning involves heating of fish to destroy the spoilage organisms present in them and elimination of the possibility of post-process reinfection by enclosing it in a container and hermetically sealing it before sterilization. Indian canned tuna finds unlimited export markets besides catering to the needs of the defence personnel and internal markets. Canned tuna is the most important processed commercial products highly popular in countries such as Japan, USA, UK and Europe. It is also in great demand in the North-East hilly regions, urban centers in India and regularly supplied to the defence services. Central Institute of Fisheries Technology, Cochin has standardized many canned products from fish and shell fish harvested from both marine and fresh waters in different styles suitable for both domestic and export markets. Many products like tuna in oil, tuna in brine, tuna in mayonnaise, tuna in tomato sauce, tuna in curry in Tin Free Steel and Gold Lacquered tin cans are available in the domestic market. These products have very good demand in international markets also specially by ethnic Indian population living abroad. Canned tuna products in the international markets include (i) canned, "solid packs", (ii) canned, "chunks" (a mixture of piece of tuna), (iii) canned, "flakes" (smaller pieces of tuna) and (iv) canned, "grated" (packed pieces of tuna flesh).

Cost and Returns of a Tuna Cannery

Though Tuna processing has many number, of avenues due to various product range, for illustration purpose the costs and returns involved in establishing a Tuna cannery in a relatively small scale has been worked out with the following assumptions.

- *The processing unit produces canned tuna steaks in vegetable oil.*
- *Target quantity of handling is 200 kg. of raw fish per day.*
- *Total number of working days per annum in 200 days.*
- *The unit is being operated in a rental building*

Capital Cost: The capital cost involved is establishing a small scale Tuna cannery works out to Rs. 10,50,000/- and the split up components of the capital cost are presented in Table.2.

Table 2. Capital Cost of a Tuna Cannery

Sl. No.	Particulars	Amount (Rs)
1.	Boiler	3,00,000
2.	Pre cooker	1,00,000
3.	Retort unit	4,50,000
4.	Exhaust line	50,000
5.	Seaming machine	50,000
6.	Furniture & other accessories	1,00,000
	Total	10,50,000

Fixed Cost

The annual fixed cost works out to Rs.4,59,000/- (Table 3). Since the unit is assumed to be operated in a rental building the rent for building is included in the fixed cost.

Table 3. Fixed Cost of a Tuna Cannery

Sl. No.	Particulars	Amount (Rs.)
1.	Interest on capital cost (@ 9% per annum)	94,500
2.	Depreciation of machineries (@ 10% per annum)	1,05,000
3.	Permanent laborers (3 men @ Rs. 5000 per month)	1,80,000
4.	Building rent (@Rs.4000 per month)	48,000
5.	Insurance premium (@ 3% of capital cost)	31,500
	Total	4,59,000

Operating Cost

The assumption made for working out the operating costs are

- Target raw fish handling – 200 kg per day
- Raw fish to dressed fish recovery – 60% (120kg)
- Dressed fish to processed fish recovery – 70% (84kg)
- Processed fish and vegetable oil proportion in can – 60:40
- Target number of cans produced – 1,30,000 per year @ 650 per day.
- Quantity of fish meat per can – 130 gm.

The operating cost on per day basis has been worked out for the benefit of easy understanding and subsequently operating cost per annum has also been worked out assuming 200 days of working days (Table.4)

Table 4. Operating Cost of a Tuna Cannery

Sl. No.	Particulars	Amount (Rs.)
1.	Cost of fish (200 kg x Rs. 80 / kg)	16,000
2.	Vegetable oil (56 liters)	5600
3.	6 ounce TFS cans (650 no. @ Rs.5/can)	3250
4.	Master cartons (27 no. @ Rs. 25/ carton)	675
5.	Women casual labourers (10 No. @Rs.80 per day)	800
6.	Miscellaneous expenses (electricity, transport, etc.)	1050
	Operating cost /day	27,375
	Operating cost for 200 days	54,75,000
	Operating cost per can (54,75,000 ÷ 1,30,000)	45.11

Net income: The net income from the tuna cannery works out to Rs. 5,66,000/- if the sale value per can is considered as Rs. 50/can (Table. 5)

Table 5. Summary of Costs and Returns

Sl.No.	Particulars	Amount (Rs.)
1.	Capital cost	10,50,000
2.	Annual fixed cost	4,59,000
3.	Annual operating cost	54,75,000
4.	Annual gross income	65,00,000
5.	Annual net income	5,66,000

Break Even Analysis

For any commercial enterprise to be economically viable in a longer run, it should have a capacity to operate above the Break Even Quantity and hence the BEQ has been worked out using the formula.

$$B.E.Q = \frac{\text{Fixed cost}}{\text{Selling Price/can} - \text{Operating cost/can}}$$

The BEQ works out to 58,175 can /annum which is found to be even less than half of the processing unit's capacity of production. It could be considered as a very clear indication of the business venture's economic and financial stability.

Pay Back Analysis

The payback period represents the period with in which the capital invested could be got back.

$$PBP = \frac{\text{Capital cost}}{\text{Netincome}}$$

The analysis of PBP for this project reveals that the capital invested would be paid back with in a period of two years which is again a very healthy indication of the projects financial genuinity.

Conclusion

Tuna processing industry is no doubt a sunrise industry, in lime light in recent years due to its expanding export as well as domestic market. It is evident that its trade value has an year on year up trend. In such a situation it is the need of the hour that the benefits out of the boom should also be passed on to the deserving but deprived sections of the society also. It could be a potential business opportunity for the unemployed rural youths and performing Self Help Groups especially for those who are near the coastal zone. The financial and economic analyses under taken for a tuna cannery with a capital investment of approximately Rs. 10 lakhs, also reveals an encouragingly healthy indications of stability. Engaging potential clients to take up the venture, would also aid for effective utilization of a so far under utilized Indian tuna resource.

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