



Marketing Channel *vis-a-vis* Economic Viability of Ornamental Fish Cum Aquarium Business in Agartala, Tripura

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Abstract

Economic viability of ornamental fish business is utmost important as this sector has been identified as a powerful tool for rural income & employment generation. The study was conducted in Agartala, Tripura in the year 2015-2016 among 14 traders actively involved in ornamental fish business in Agartala. The data collected through observation, personal interviews with designed interview schedule as well as focus group discussion with the respondents revealed that majority of the respondents (78.57%) were young aged, all are literate and 28.57% of them were graduates. Around 42.86% of the traders considered aquarium business as their main occupation. Around 71.43% were doing retail business and 28.57% were performing as wholesaler-cum-retailer. Majority of traders (28.57%) earned between ₹ 3,60,000-4,32,000 per annum. Among the identified six different channels in ornamental fish marketing in Tripura, majority of the traders (64.29%) used to take benefit of marketing channel V due to the higher profit margin i.e., purchased ornamental fishes from the producers of outside state and used to sell directly to the consumers and/or to the retailers. Profitability analysis of the ornamental fish trading indicated that all the cases studied generated positive net returns. Payback period were very short i.e., 0.14 years and 0.29 years for wholesaler cum retailers and retailers respectively which reflects that the investment in the business of ornamental fisheries and aquarium is less risky as well as repaid in the shorter time period and is considered the better choice as investment or action costs are recovered sooner and are available again for further use.

Keywords: Ornamental fish, marketing channel, economic viability, business, traders

Ornamental fish keeping is emerging as one of the most popular hobbies across the world irrespective of age, class, creed or geographical variations in the residing area of hobbyists. Ornamental fishes market in the world for public aquaria is less than 1% at present and over 99% of the market for ornamental fish is still confined to hobbyist (Selvarasu and Sankaran, 2011). The attraction, relatively minimum requirement of space and attention compared to other pet animals is the reason for growing interest in keeping aquarium all over the world. As popularity gained momentum, the need to transfer ornamental fishes from the resource abundant places to resource deficient places resulted in the marketing of ornamental fishes. The growing interest in aquarium fishes has

resulted in steady increase in aquarium fish trade, globally.

In the last decade, the ornamental exports and imports grew from US\$ 167.6 million and US\$ 245.6 million, respectively in 1999 to US\$ 343.9 million and US\$ 349.4 million, respectively in 2008. The latest FAO statistics presented the world ornamental fish trade as US \$ 731 million with an annual growth rate of about 10%, of this US \$ 392 million is from imports and US \$ 339 million is through exports (FAO, 2007-2011). More than 2500 species of ornamental fishes are traded and some 30-35 species of fresh water dominate the market. The trade with an annual growth rate of 8% offers a lot of scope for development. India's share in global ornamental fish trade is negligible and at present

the ornamental fish export from India is dominated by the wild caught species (Selvarasu and Sankaran, 2011). The USA is the largest market for ornamental fish and importing fishes valued at US \$ 60 million annually followed by Japan (US \$ 32.9 million) and Germany (US \$ 21 million). Singapore is the top Exporter, which exports fishes worth (US \$ 43) million annually followed by Hong Kong (US \$ 17 million) and Indonesia (US \$ 12.8 million) (Biswas *et al.*, 2007; Selvarasu and Sankaran, 2011). Among the 31 countries exporting ornamental fish in Asia, the share of India is less than 1% (Dey, 2010; Rani *et al.*, 2013). India's overall domestic trade in ornamental fish is estimated to be nearly 15 crores (Kurup and Antony, 2010) and is growing at the rate of 20% annually (Yadav *et al.*, 2007). Indian ornamental fish market is dominated by only 30-35 species of freshwater fishes and the country could not make any head way in export of marine ornamental fishes due to many reasons (Swain, 2010). The country has the potentially to capture 10% of the world market, utilizing its vast and varied indigenous ornamental fish stock with the availability of trained manpower (Gopakumar, 2005).

The major linkage in ornamental fish market prevails between consumers/hobbyists and sellers/traders as well as domestic and international market. In order to strengthen Indian position in international ornamental fish trade, MPEDA has implemented several strategies to adopt in terms of technology, infrastructure in order of to develop export demand based production for major importers in EU, USA and Japan. The distribution and marketing channel for the ornamental fish and plants in India is developing. The exporter (or) wholesaler plays an important role in promoting breeders and consumers. Wholesaler usually sells the fishes to local retailers and in turn, retailers directly sales to local customers, hobbyists etc. (Selvarasu and Sankaran, 2011).

The state of Tripura is a small land-locked hilly state with diversified aqua resources in the form of rivers, streams, lakes, reservoirs, swamps, ponds & minibarrages. Aquarium fish keeping has become a popular hobby in Tripura. Tripura contributes 123 fishes to the total 250 native ornamental fish species of north-eastern states (Mandal *et al.*, 2007). Despite the economic significance of ornamental fisheries industry, its development has been

constrained due to many factors. However, they have not properly exploited in business point of view. Lack of scientific information on the native aquatic fauna, lack of business outlook may be the main reason for poor performance of this sector (Mandal *et al.*, 2007). The ornamental fish industry has been identified as a powerful tool for rural income & employment generation as it stimulates growth of a number of subsidiary industries besides being a foreign exchange earner. Economic viability of the trading unit engaged in ornamental fish marketing is important for the growth of the enterprises. Well organized marketing system is utmost important for the growth of the industry of ornamental fish and related accessories of aquarium and no systematic studies which examine the economic viability of ornamental fish trading units in Tripura exist as on date. With this background the research was conducted to study the socio economic profile of the ornamental fish traders, the marketing channel of ornamental fish business as well as the economic viability of the ornamental fish cum aquarium business so that stakeholders interested in the ornamental fisheries development would take concentrated efforts based on the findings of the study. Viability studies may throw light on the economic performance of the marketing of ornamental fishes which can help potential entrepreneurs in this lucrative business of ornamental fishes through production and marketing system.

Methodology

The study was conducted during the year 2015-16 by *expost-facto* research design. West Tripura district of Tripura was selected purposively for the present study because of the presence of diverse population interested in this hobby along with the number of aquarium shops are also largest among all the districts in the state so as trade volume. This district is also the major district of Tripura where the state capital is situated. Moreover, Mandal *et al.*, (2007) reported that more than 2000 aquarium fish keepers are living in the Agartala city. Total 14 Traders actively involved in ornamental fish business in Agartala were identified by secondary sources as well as pilot study. The respondents were interviewed using pre-tested designed interview schedule for capturing details on their

socio-economic status, arrivals and composition of ornamental fishes in Tripura market. Marketing channel was also studied by focus group discussions along with a semi structure interview schedule. Economic viability is the most crucial incentive for ornamental fisheries development. To examine profitability of various domestic aquarium business systems, a simple cost return analysis as per Shang (1990) was employed by adopting a three-step procedure, which included estimation of input costs, estimation of revenues and calculation of profits. Efficiency indices like payback period, the ratio of net profit to total cost, the ratio of variable cost to total initial investment and rate of return on investment and total costs were also estimated.

Results and Discussion

Socio-economic profile of traders

Traders' profile was studied and findings are presented in Table 1. As per the table, it was found that 100% of the traders involved in aquarium business were men. Majority of the respondents (78.57%) were young aged (18 to 35 years) followed by 21.43% middle aged (36 to 50 years) category. Most of the traders were educated. While 28.57% traders were graduate, majority of them (64.29%) studied up to 12th standard. Only 7.14% of the traders were post graduates. Whereas 42.86% of the traders considered aquarium business as their main occupation, 57.14% of such trader community was found considering aquarium business as a sub occupation. In terms of length of aquarium business, while 35.71% traders started it in the range of 5-10 years back, 21.43% of them were observed to be doing the business for less than 5 years. Side by side, for both the categories of traders doing the business either between 10-20 years or more than 20 years their proportional distributions were 21.43% in each of the cases. Majority of traders (28.57%), who had aquarium business, earned between ₹ 3,60,000-4,32,000 per annum and It was similar (21.43%) for both of those traders who earned between the ranges of ₹ 2,16,001-2,88,000 and ₹ 2,88,001-3,60,000 per annum. Even 21.43% of the traders were observed to earn ₹ 4, 32,001 and above per annum from their aquarium business. While 57.14% traders entered in to this aquarium business because they considered it as a profitable

venture, 35.72% were expressive that it was their hobby which had driven them to start such business. During the study of nature of the business unit it was found that 71.43% were doing retail business and 28.57% were performing as whole saler-cum-retailer. For the majority of the traders (85.71%) ownership was individual and in 14.29% cases it was family ownership. Interestingly, 92.86% traders never attend any training programme on ornamental fisheries and only 7.14% traders had attended some training on the subject. Majority of the traders (42.86%) were running shops through their self experience where as 28.57% traders were noted to take technical advice from fellow traders for running the shop. Moreover, 28.57% traders were indicative of taking the support from internet.

Table 1: Socio-economic profile of traders

Sl. No.	Variables	Category	Frequency (f)	Percentage (%)
1.	Sex	Male	14	100
		Female	0	0
2.	Age	Young(18 to 35 years)	11	78.57
		Middle (36 to 50 years)	3	21.43
		Old (50 and above)	0	0
3.	Educational level	Up to High school (8 to 12years)	9	64.29
		Graduate (10+2+3 years)	4	28.57
		Post Graduate (10+2+3+2 years)	1	7.14
4.	Level of occupation	Main occupation	6	42.86
		Sub occupation	8	57.14
5.	Total annual income (₹)	1,44,001-2,16,000	1	7.14
		2,16,001-2,88,000	3	21.43
		2,88,001-3,60,000	3	21.43
		3,60,001-4,32,000	4	28.57
		4,32,001 and above	3	21.43

Sl. No.	Variables	Category	Frequency (f)	Percentage (%)
6.	Experience	Less than 5 years	3	21.43
		More than 5 years - 10 years	5	35.71
		More than 10 years -20 years	3	21.43
		More than 20 years	3	21.43
7.	Reasons for entering in the business	Profitable business	8	57.14
		Hobby leading to profession	5	35.72
		Interest	1	7.14
8.	Nature of business unit	Wholesaler	0	0.00
		Retailer	10	71.43
		Wholesaler cum retailer	4	28.57
9.	Type of ownership	Family	2	14.29
		Individual	12	85.71
10.	Training attended regarding ornamental fisheries	Yes	1	7.14
		No	13	92.86
11.	Source of technical advice	Self-Experience	6	42.86
		Fellow traders	4	28.57
		Internet	4	28.57

Marketing channel

The marketing channels of ornamental fish in Tripura are depicted through schematic representation in the Fig. 1 and 2. It is noted from the figure that there were six different channels (viz. channel I, Channel II, channel III, channel IV, channel V and channel VI) in ornamental fish marketing in the study area. During investigation it was observed (Table 2) that out of 14 traders, around 64.29% used to take benefit of marketing channel V due to comparatively better profit margin. It reflects that majority of the wholesaler cum retailer traders of the study area directly purchased ornamental fishes from the producers of outside state preferably from West Bengal and used to sell directly to the consumers and/or to the retailers. It was also found that half of the traders (50%) used to avail

channel no. IV where the brokers from outside state used to play as important intermediaries in the market channel as they procured fishes directly from the producers from the state they belongs to mainly in West Bengal and used to sell to local wholesaler cum retailers and/ or retailers who on the other hand used to sell directly to the local consumers. It was also witnessed that some outsider wholesaler used to purchase ornamental fish like eel (*Macrogynatus aculeatous*), from natural fish collector and sometimes brokers were also reportedly involved as market intermediaries (channel no. VI). In fact local retailer traders were either procured from the brokers or directly purchased from the wholesaler of outside state and then finally used to sell to the local consumers. The channel I and channel II were using by only a few number of traders (14.28 %) each. There are only a few number of ornamental fish production centre in Tripura and it was also witnessed by the traders that the quality of ornamental fishes produced locally is not satisfactory and thus demand was very poor at the end of consumers. Further, the price of the locally produced ornamental fishes was also not competitive with the price offered by the outside traders as well as producers.

Table 2: Different marketing channel regarding ornamental fish business found in Tripura

Channels	Frequency	Percentage (%)
1	2	14.28
2	2	14.28
3	4	28.57
4	7	50
5	9	64.29
6	5	35.71

Economic viability of ornamental fish marketing

This part represents the results of a detailed economic analysis of profitability of different category of trading units of the study area and is presented in Table 3. During the time of the study no wholesale trader were reported. The study identified four wholesalers cum retailers trader and they had purchased both land and constructed shop for doing business. Further, ten retailers were reported in the study area and 30% of them had not

invested on land and building and they either hired shops or converted a portion of their own house as ornamental fish shop. Infrastructure like aquarium tank (6.03%) and equipments (10.45%) constituted the major investment cost for the wholesaler cum retailer following land and building cost. The total initial investment cost for wholesaler cum retailers was ₹ 58.84 thousands as against the ₹ 38.15 thousands invested by retailers. The ratio of fixed cost to total cost of wholesaler cum retailer and retailer was 8.84% and 17.40% respectively. The ratio of variable cost to total cost of wholesaler cum retailer and retailer was 91.16% and 82.60% respectively. Selling of ornamental fishes, aquarium accessories, feed, medicines and chemicals generated revenue and for wholesaler cum retailer and retailer was generating revenue of ₹ 7.29 lakhs/anum and ₹ 3.75 lakhs/anum respectively (Table 3).

Table 3: Economic viability of different trading unit of study area

Category	Retailer (n=10)	Wholesaler cum retailer (n=4)
Initial Investment (₹)		
Land	21,076.04	25,273.90
Building	7,571.50	13,916.70
Aquarium tank	2,030.00	3,250.80
Equipments	3,472.10	5,630.00
Other infrastructure	2,720.00	3,891.00
Miscellaneous	1,284.00	1,873.00
Total Investment Costs	38,153.64	53,835.40
Fixed Cost (₹/Anum)		
Depreciation	14,892.70	19,910.20
Interest on initial investment	0.00	0.00
Rent	22,000.00	0.00
Miscellaneous	8,426.40	13,650.00
Total Fixed costs (a)	45,319.10 (17.40%)	33,560.20 (8.84%)
Variable Cost (₹/Anum)		
Fish	91,095.00	1,85,530.00
Accessories	30,480.40	41,250.00
Feed	6,028.00	9,250.00

Medicine	1,800.30	3,577.25
Chemical	2,126.28	3,520.20
Transportation & packing	68,900.00	80,250.00
Electricity	4,200.00	5,300.00
Labour cost	8,500.00	13,500.00
Miscellaneous	2,000.00	3,800.00
Total variable costs (₹)	2,15,129.98 (82.60%)	3,45,977.45 (91.16%)
Total Cost (a+b) (₹/Anum)	2,60,449.08 (100%)	3,79,537.65 (100%)
Revenue (₹)		
Fish	2,90,115	5,21,762.5
Accessories	60,025	10,3325
Feed	18,020	22,125
Medicine	3,350	5,475
Chemical	3,370	5,875
Total revenue (₹)	3,74,880	7,28,562.5

the data represents average data of the samples.

(Figures in parenthesis indicates the percentage of respective costs to total cost)

Comparison of profitability of different trading units in Agartala, Tripura

In Table 4, profits and efficiency indices of different categories of traders are compared. On the whole, ornamental fish trade in Agartala, Tripura had been a profitable activity. It may be noted that the wholesaler cum retailer trader had a net profit of ₹ 3.49 lakhs. Retail traders had a net profit of ₹ 1.14 lakhs. Payback period and rate of return are also provided in the table. Payback period measures the time required for total cash outflows to equal total cash inflows, that is, the time required to break even and from the table it is clearly visualized that payback period of both the group of traders were very short i.e., 0.14 years and 0.29 years for wholesaler cum retailers and retailers respectively. It reflects that the investment in the business of ornamental fisheries and aquarium is less risky as well as repaid in the shorter time period and is considered the better choice as investment or action costs are recovered sooner and are available again for further use. Rate of return is a profit on an investment or costs over a period of time, expressed as a proportion of the original investment or costs. Rate of return on investment was found higher

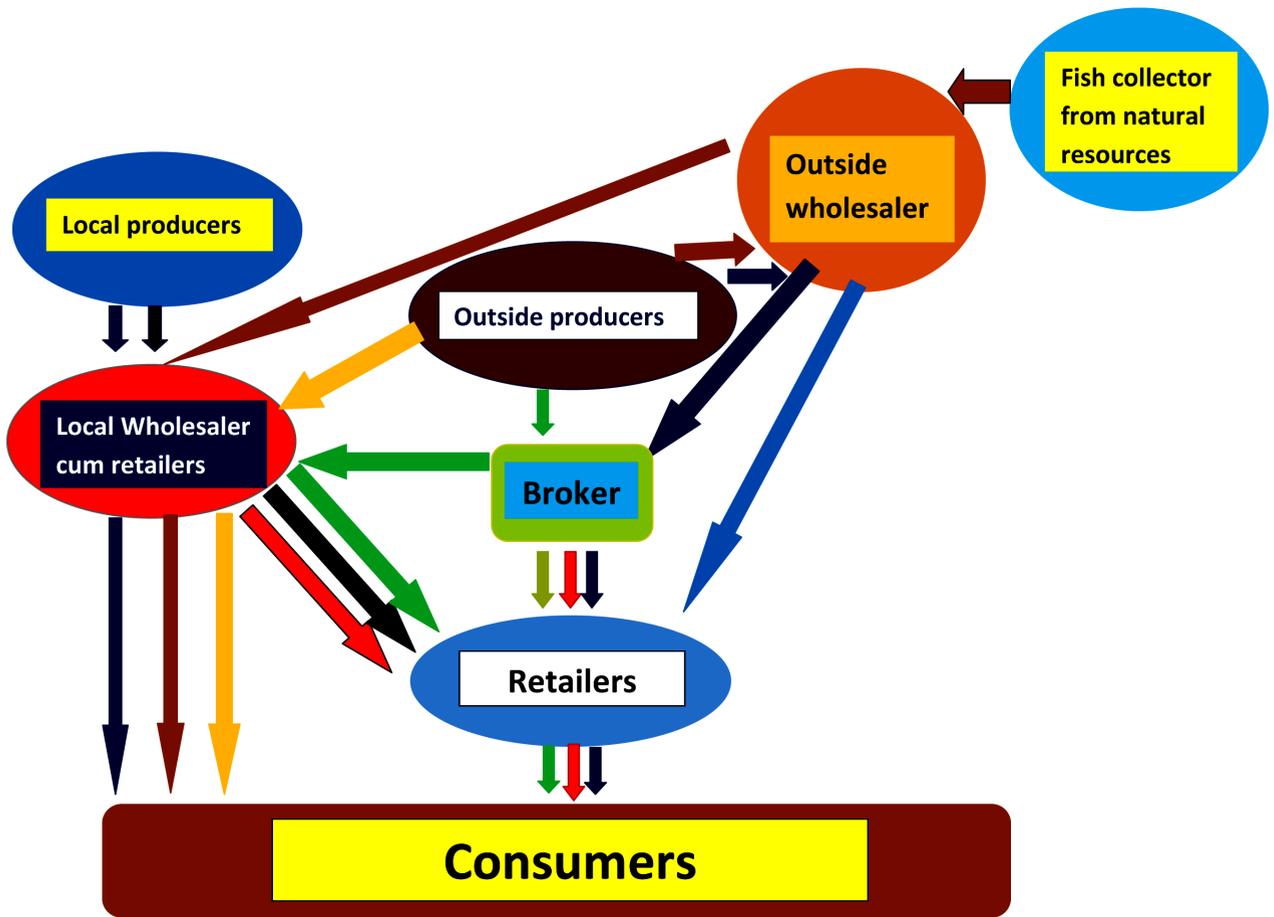


Fig. 1: Marketing channel of ornamental fish trading in Tripura

Marketing channel of traders:

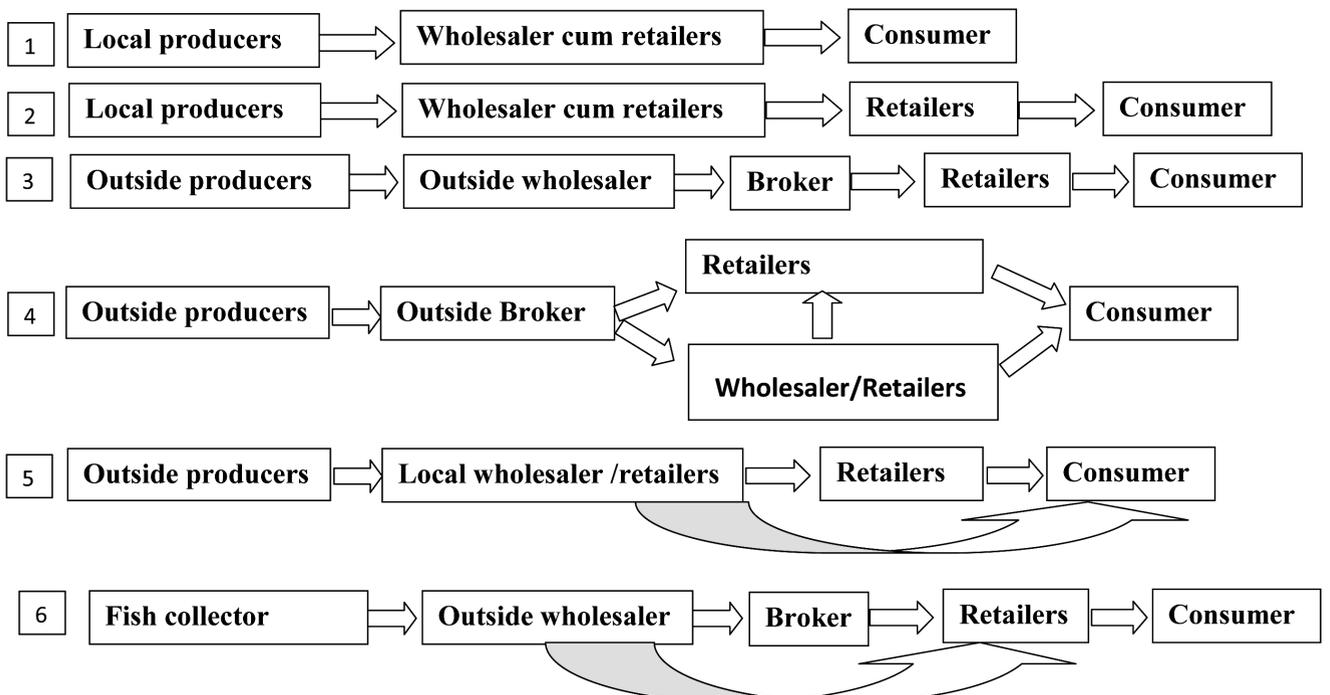


Fig. 2: Diagrammatic representation of different marketing channel found in Tripura

(648.32%) among wholesaler cum retailers as against retailers (299.92%). Rate of return on total cost was also higher among wholesaler cum retailers (91.97%) as against retailers (43.94%). It would appear that the investment in big-Sale on the enterprise was the wiser move. However, for both the groups of traders rate of return on investment, total cost, variable cost as well as fixed cost was found to be higher in the ornamental fish trading and aquarium business which implied that the enterprise is profitable in nature. To sustain economic profits, traders minimized input costs by substituting family labour for hired labour, reduced transportation and packing costs or even recycled packing materials. These cost reducing methods were highly useful to reduce costs and increase profits. The variable cost and investment ratio as given above indicated that lined systems were subjected to intensive utilization of capital investment. In this regards, Shyama (2008) opined that in general, lower the relative ratio of variable cost to investment less will be the efficiency of capital utilization. Both investment and variable cost complement each other in reaching the efficiency level of output. A very high initial cost and very low variable cost lead to less efficient use of capital and consequently low efficiency in production.

Table 4: Average Profitability of different traders of Agartala, Tripura

Category	Retailer (n=10)	Wholesaler cum retailer (n=4)
Total cost *	2,60,449.08	3,79,537.65
Revenue *	3,74,880.00	7,28,562.50
Net profit*	1,14,431.00	3,49,024.85
Payback period**	0.29	0.14
Rate of Return (%)		
On investment	299.92	648.32
On fixed cost	252.50	1040.00
On variable cost	53.19	100.89
On total cost	43.94	91.97

*in ₹/year ** in years

Percentage distribution of different items under variable cost among traders

Ornamental fish traders incurred various kinds of costs to procure inputs for undertaking marketing

activities. The expenditures incurred in fish trading are categorized into fixed and variable costs. The data on percentage distribution of different items under variable cost among different type of traders are depicted in the Fig. 3 and 4. The major variable costs in ornamental fish trading were for purchasing of fish (54% for wholesaler cum retailers and 42% for retailers) followed by transportation and packaging cost (23% for wholesaler cum retailers and 32% for retailers), cost of aquarium accessories (12% for wholesaler cum retailers and 14% for retailers). The other costs were labour, feeding, electricity and fuel and medicines. These costs varied from traders to traders because of the difference in management skill, distance from supply centre, firm size and marketing channel availed.

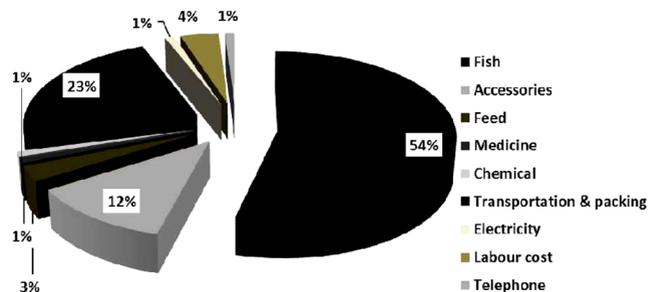


Fig. 3: Percentage distribution of different items under variable cost among Wholesaler cum retailers

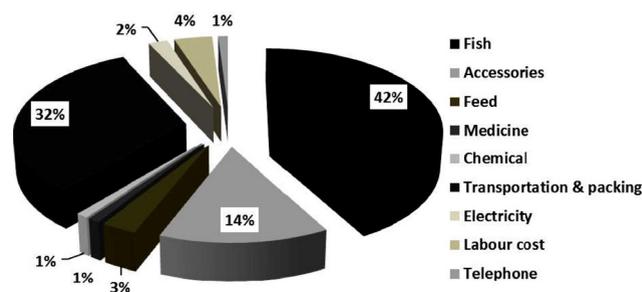


Fig. 4: Percentage distribution of different items under variable cost among Retailers

Percentage distribution of different items under fixed cost among traders

Fixed costs included depreciation on infrastructure and equipments, interest on initial investment, rent and other miscellaneous costs like tax, rent, insurance etc.. The data on percentage distribution of different items under fixed cost of wholesaler cum retailers as well as retailer are given in the Fig. 5 and 6. The major fixed costs in ornamental fish trading were depreciation on infrastructure

and equipments (59%) as witnessed by wholesaler cum retailers. Whereas, the maximum percentage of fixed cost contributed by rent (48%) among retailers as majority of them had not invested on land and building and they either hired shops or converted a portion of their own house as trading unit.

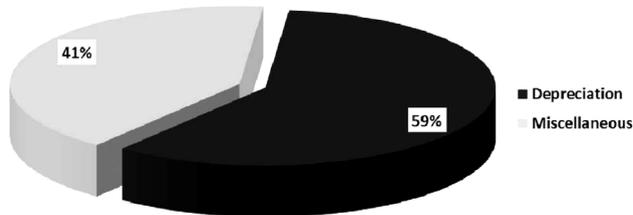


Fig. 5: Percentage distribution of different items under fixed cost of wholesaler cum retailers

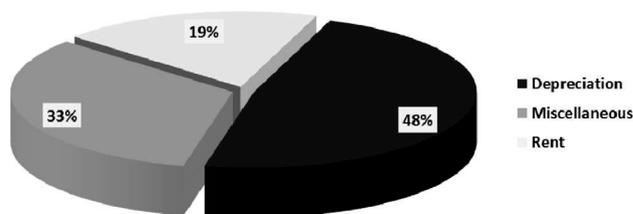


Fig. 6: Percentage distribution of different items under fixed cost of retailers

Percentage distribution of different items under revenue of traders

The data on Percentage distribution of different items under revenue generated by the traders in ornamental fish marketing are given in the Figure 7 and 8. It is clearly visible from the said figures that majority of the revenue generated from fish selling (79% for wholesaler cum retailers and 77% for retailers) for both type of the traders followed by selling different aquarium accessories (16 % each for both type of the traders). The rest of the revenues were generated by selling fish feed, medicines, chemicals etc.

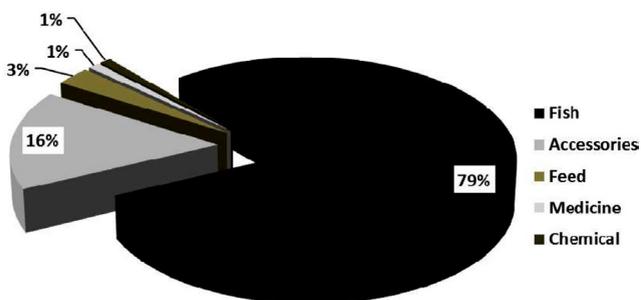


Fig. 7: Percentage distribution of different items under revenue of wholesaler cum retailers

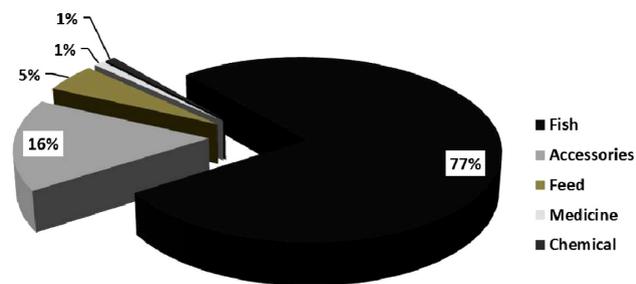


Fig. 8: Percentage distribution of different items under revenue of retailers

Conclusion

There are only a few number of ornamental fish production centre in Tripura and it was also witnessed by the traders that the quality of ornamental fishes produced locally is not satisfactory and thus demand was very poor at the end of consumers. Further, the price of the locally produced ornamental fishes was also not competitive with the price offered by the outside traders as well as producers. Despite of huge demand, ornamental fishes as well as aquarium accessories from other states dominate local markets of Tripura. The study suggest that measures are required to ensure steady availability of the ornamental fishes and other accessories of demand in the state itself through due technical as well as promotional support to the local producers.

Profitability analysis of the ornamental fish trading indicated that all the cases studied generated positive net returns. Wholesaler cum retailer trader had a net profit of ₹ 3.49 lakhs whereas, retail traders had a net profit of ₹ 1.14 lakhs. Pay back period were very short i.e., 0.14 years and 0.29 years for wholesaler cum retailers and retailers respectively which reflects that the investment in the business of ornamental fisheries and aquarium is less risky as well as repaid in the shorter time period and is considered the better choice as investment or action costs are recovered sooner and are available again for further use. The study revealed that for both the groups of traders rate of return on investment, rate of return on total cost, and rate of return on variables cost as well as fixed cost was found to be higher in the ornamental fish trading and aquarium business which implied that the enterprise is profitable in nature.

Recommendations

Ornamental fisheries in Tripura demonstrate great potential for development. However, lion's share of the trade in this market was of exotic fishes and the demands for different varieties of fishes are changing from time to time. Constantly changing preferences and attitudes of consumers made the domestic ornamental fish market a dynamic one. Therefore, promotional efforts are required to catch the domestic market opportunity through entrepreneurship development in this emerging area.

Tripura is blessed with huge indigenous ornamental fish species, the study suggests aggressive selection of prospective native ornamental fish species, especially having attractive color spectrum, and their breeding as well as due promotion under the now flourishing entrepreneurial avenues for aquarium fish keeping.

Rate of return on investment, rate of return on total cost, rate of return on variable cost as well as fixed cost was found to be higher in the ornamental fish trading and aquarium business to imply that the enterprise is viable and profitable in nature and the investment in big-scale on the enterprise may be the wiser move.

Appropriate technology transfer and strategies for culture of ornamental fishes have to be developed as well as standardized and need to be diffused among the farmers and rural youths. Additional varieties of ornamental fishes should be incorporated in culture operations along with the indigenous varieties.

Technology-based scientific studies should be developed in the line of mass production and rearing of ornamental fishes in the state to minimize import cost from other states.

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