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Perception of Farmers Towards the Production and Marketing of Aquaculture products in Cuddalore District

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Abstract

In the historical past, aquaculture remained multi-locational and isolated, each location having evolved its own pattern, until in recent times, when with the development of fast means of communication and travel bridging distances in progressively decreased time, species are being cultured adopting a measure of standardised practices and sites when they are most suited. An understanding of the principles of operation of capture and culture fisheries helps to throw light on the definition of Aquaculture. The expressions capture and culture fisheries are self-explanatory. In the former, one reaps the aquatic harvest without having to sow, whereas, in the latter, one has to sow the seed, nurse it, tend it, rear it and harvest it when it grows to marketable size. The present study aims to find out the Perception of Farmers towards the Production and Marketing of aquaculture products in Cuddalore District. A samples of 120 respondents selected randomly were studied. Primary data were collected by using a structured interview scheduled. All the respondents were asked the some questions in the same fashion and they were informed the purpose of study. Cross tabulation and Chi-square test analysis were applied. The findings and observations are the result and outcome of the interpretations made during the study of analysis.

Keyword: *Production, Marketing and Aquaculture products*

1. Introduction

In North America, fish culture has developed from the turn of the century emphasis having been laid on trout for stocking in cold water and black bass in warm waters. Except for the referred culture of tilapia in Egypt, the origin of fish culture in Africa is recent. It was only at the end of II world war that efforts were made to introduce and develop fish cultivation. The

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prize species in Africa is tilapia, which, in recent years, has been extensively transplanted into many warm countries almost round the equator. Tilapia has been referred to as the 'Wonder fish' of Africa and several attempts to popularise tilapia culture in various African countries did not achieve so much success as expected. In some countries mixed culture of tilapia and catfish have achieved some success lately; aquaculture prospects and priorities for Africa are now of its role in rural development.

The fish which have figured most in inter-regional transplantation are rainbow trout, carp, certain species of tilapia (T. mossambica and T.nilotica) and Chinese carps (Ctenophatyngodan idella and Hypophthalmichthys mollitrix). Fish culture using some standard methods has, in recent years, got itself extended to many parts of the world. Fish breeding, artificial fertilization and pellet feeding, which at one time were applied to selected species, are now made applicable to many cultured species and, as time advances, more and more species are falling in line, though details vary. With further research in aquaculture, especially on production of fish seed and fish feed technologies, aquaculture in heading towards a quantum jump in years to come.

The art of aquaculture is very old. The evidence that Egyptians were probably the first in the world to culture fish as back as 2500 B.C. come from pictorial engravings of an ancient Egyptian tomb showing tilapia being fished out from an artificial pond. The Romans are believed to have reared fish in circular ponds divided into breeding areas. Culture of Chinese carps was sidespread in China in 2000 B.C. Writings in India made in 300 B.C. suggest means of rendering fish poisonous in the Indian sub-continent in times of war. This implies that fish culture prevailed in some Indian reservoirs. Some historical documents compiled in 1127 A.D. describe methods of fattening fish in ponds in India. Culture of Gangetic carps in Bengal in the Indian Sub-continent is of historical origin.

The Chinese carried with them their traditional knowledge of carp culture to the countries they emigrated like Malaysia, Taiwan, Indonesia, Thailand, Cambodia, Vietnam etc. In the Philippines, fish culture has been done in brackish water ponds for centuries. Eel culture in Japan is also very old. In Central and Oriental Europe, common crop culture developed along with monasteries in the middle ages. Later, with the development of pond fertilization and artificial feeding, carp culture got a new lease of life especially in Central and Oriental Europe. Simultaneously in Europe, Salmonid culture began, fillip having been provided by salmon breeding and rearing techniques which were developed by them. Pollution in the aftermath of industrialisation, and hydro-electric development, led to restocking of open waters in Europe. This gave a new texture to development of aquaculture in Europe.

2. Review of Literature

Lotos Kan (2012) "Direct marketing Hawii's freshwater ornamental Aquaculture products" Say's that surveys were distributed 10 over 100 Hawaii Freshwaters aquawaltene ornamentalists to construct a profile of the industry and Investigate issues affecting the growth of the industry, most of the freshwater ornamental enterprises repotted that they had lower than for employees and have been in business for over six years. The freshwater ornamented fish producers reported combined sales of ovens $ 1, 20,000 or approximately half of the estimated freshwater ornamental aquaculture industry.

Rosamond L. Nayotor (2012) in his article "Effect of aquaculture on world fish supplies", Says that, Global production of farmed fish and shellish has more than doubled in the past 15 years. Many people believe that such growth relieves pressure on ocean fisheries, but the opposite is true for some types of aquaculture. Farming carnivorous species requires large inputs of world for feed. Some aquaculture systems also reduce wild fish supplies through

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habitat modification, wild seedstock collection and other ecological impacts. On balance, global aquaculture production still adds to world fish supplies it must reduce wild fish inputs in feed and adopt more ecologically sound management practices.

Kishor C samal, Market Haherty and Dala gobinda pradha (2012) in his article "Coastal Aquaculture rural livelihoods and environment Insight from crissa, India". Say's that the paper examines the diverse impacts of coastal shrimp aquaculture on communities in Orissa (India). Shrimp farming as played an important role in generating employment opportunities and rising per capital Income. This, in turn, has resulted in decreased dependency on agriculture and artisan fisheries for food and income, Unfortunately, the development of shrimp farming has also had a detrimental impact on coastal ecosystems. Environmental degradation and concerns over shrimp farming practices, now threaten the long-term viability of shrift farming. Unless suitable measures are takes to overcome the problems faced by the local farmer, the potential that shrimp farming has to provide a basis for sustainable livelihoods will not be realized.

B.Ganesh Kumar, Kle, Datta, G.Vidya sagar Reddy and Muletha Menon (2013). In his article "Marketing system and Efficiency of Indian major carps India". Says that India is the third largest producer of fish and second largest producers of fresh water fish in the world PAD, (2013). Since the beginning of this decade, Inland fish production in India has exceeded the marine fish landings. The recorded Inland fish production of 3.53 million tons (MI) and Marine fish production of 2.78 Mt in 2012-2013. The inland fisheries subsector of the country has grown at the rate of 6.55 percent during the past decade and contributes 1.19 percent to the gross domestic product of the country (ICAR, 2006). Hence, the Fisheries sector has to address the issues of demand factors than of supply factors to sustain its growth in future of the 3.53 Mt of Inland fish produced in India, aquaculture contributed 2.2 Mt. Aquaculture in India is synonymous to carp culture since the latter alone contributes more flam so pen each to the total aquaculture production in the county.

Joan Rosscup Reipe (2013) in his article "Making wise choices when direct marketing your aquaculture product" says that to avoid certain failure of an aquaculture enterprise, producers must determine the market place as an initial step. Midwest farmers in traditional farming enterprise, such as corn, soybeans, beef, swine and poultry use well-established markets that have been highly refined over the last few decades. Aquaculture, unlike other agriculture enterprises, is in its infancy, especially in the Midwest, as a result large-scale processing plants in the Midwest, solely for farm raised products are nonexistent, fish and shellfish farmers are forced to use alternative, poorly established markets for their products.

M.Devaraj (2013) in his article, "Perspective on coastal aquaculture in India" Says that 'the slow growth rate in marine capture fisheries of the coastal sector world over. Capital intensive and risk prone deep sea and oceanic harvest coupied with great demand for target groups for domestic and export markets have created a pressing necessity to evolve. Even though the Indianies country is blessed with vast cultivable coastal and brakish water ayes and with rich potentially cultivable candidate species. For faming (20 species of finishes, 29 crustaceans, 17 molluscs, 7 seaweeds and many other species of auxiliary resources). We have get to go a bay way to achieve our targets in aquaculture. The paper reviews the R&D works carried out by $CMFR_1$ for crustacean, molluseam, finfish Mari culture, seaved culture and their developmental programmes required to be undertaken in the future.

Joseph E Morris (2014) in his article "Niche marketing your aquaculture products" Says that this bulletin discusses general marketing concepts as applied to food fish and presents ideas for selling aquaculture products locally food fish production offers the greatest potential for aquaculture expansion in the Mid-west; therefore, most of this bulletin specifically addresses the process of marketing food fish many of the same marketing principles apply to other types of aquaculture products such as fingerlings sport fish, and ornamental fish.

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Santhanakrishnan (2014) In this article, entitled "Indian aquaculture prospects and perspectives for sustainable development in the 21st century" has studied the present status of Indian aquaculture production, and its export potential, He has conclude that the development of aquaculture most be guided on the basis of environmental Impact assessments and capacity of local environment.

Dennis Meintosh (2014) in his article "Aquaculture Risk Management" says that Aquacultures face marketing risks that are often species and system specific; these fore, bald categories of market risk are presented hose. Other marketing risks include: product pricing, where the cost of production on exceeds the available market price the inability to supply existing markets; competition from other production strategies, Including capture fisheries as well as other culture technologies; competition from alternative commodities such as beef, children, or pork or simply competition from other producers, either local, regional national or international, like production risks than can reduce the quantity and/or quality of the marketable product and result in a financial loss market risks can have equally dramatic impacts on your bottom line. It you can't sell what you are producing for more than it costs to produce, you face financial loss.

M.N. Kutty (2014) in his article, "Aquaculture development in India from a global perspective" says that, in this paper the major trend in global aquaculture production has been presented. Quantities and corresponding values of aquaculture production (fish and shellfish only) in the world and in India, for the period 1987 to 1996 while the growth in aquaculture production is similar. The rate of increase in global production in quantities is more impressive. The per cent increase in world production for 2013-2014 is 148%, while that for India is126%.

3. Objectives of the Study

a)To analyse the perception of aquaculture farmers towards the production of fish and prawn in Cuddalore District

b) To examine the perception of aquaculture farmers towards the marketing of aquaculture products in Cuddalore District.

c)To provide major findings and to make suggestions based on the study.

4. Methodology

The study was based on both primary and secondary data. An exploratory survey was conducted in 22 village panchayats out of 37 village panchayats of Cuddalore District. The primary data were collected from 120 aqua farmers from 50 villages among 22 village panchayats using well- structured questionnaires. Secondary data were collected from the Taluk office of Cuddalore, various journals, websites and from the library of Annamalai University, Chidambaram. The Cuddalore District was selected for the study. Convenience sampling technique was done for collecting the data as the total population of the aqua farmers could not be identified by the researcher. 120 aquaculture farmers were selected as sample for the study. Appropriate statistical techniques have been used to analyse various categories of data collected from primary and secondary sources. Percentage analysis and chi-square analyses were used for the analysis. The aim of the study was to know the production and marketing strategies of aquaculture products in Cuddalore District. It also highlights the different kinds of aqua products in the taluk. By conducting the study, it was possible to identify the problems and prospects and the needs of the farmers in Cuddalore District. This helped in suggesting the refinements or remedial measures to overcome the problems.

5. Analysis and Discussions

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Table 1
Nature of ownership and type of aquaculture

Nature of ownership	Executed pond	Brackish water pond	Sea water pond	Others	Total
Own	34 (28.3%)	19 (15.8%)	5 (4.2%)	0	58 (48.3%)
Leased	55 (45.8%)	0	7 (5.8%)	0	62 (51.7%)
Total	89 (74.2%)	19 (15.8%)	12 (10.0%)	0	120 (100.0%)

Calculated chi-square value	Degrees of freedom	P value
24.182	2	0.001 (P<0.01) Significant

Source: Primary data

H_0: There is no relationship between the Nature of ownership and the type of aquaculture.

Since the P value is less than 0.01, the difference is significant and hence the null hypothesis is rejected at 1 per cent level of significance. So, we infer that, there is a relationship between the Nature of ownership and the type of aquaculture.

Table 2
Nature of ownership and how many days harvesting aquaculture product

Nature of ownership	60 days	90 days	120 days	120 days above	Total
Own	14 (11.7%)	3 (2.5%)	3 (2.5%)	38 (31.7%)	58 (48.3%)
Leased	3 (2.5%)	6 (5.0%)	4 (3.3%)	49 (40.8%)	62 (51.7%)
Total	17 (14.2%)	9 (7.5%)	7 (5.8%)	87 (72.5%)	120 (100.0%)

Calculated chi-square value	Degrees of freedom	P value
9.529	3	0.023 (P<0.01) Significant

Source: Primary data

H_0: There is no relationship between the Nature of ownership and period of aquaculture harvest.

Since the P value is less than 0.01, the difference is significant and hence the null hypothesis is rejected at 1 per cent level of significance. So, we infer that, there is a relationship between the Nature of ownership and period of aquaculture harvest.

Table 3
Nature of ownership and price of aquaculture products

Nature of ownership	Quality	Availability	Market rate	Others	Total
Own	7 (5.8%)	3 (2.5%)	48 (40.0%)	0	58 (48.3%)
Leased	0	8 (6.7%)	54 (45.0%)	0	62 (51.7%)
Total	7 (5.8%)	11 (9.2%)	102 (85.0%)	0	120 (100.0%)

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Calculated chi-square value	Degrees of freedom	P value
9.503	2	0.009 (P<0.01) Significant

Source: primary data

H_0: There is no relationship between the Nature of ownership and Price of aquaculture.

Since the P value is less than 0.01, the difference is significant and hence the null hypothesis is rejected at 1 per cent level of significance. So, we infer that, there is a relationship between the Nature of ownership and the price of aquaculture products.

Table 4

Nature of ownership and type of weighing method

Nature of ownership	Size wise	Quantity wise	Weighing machine	Others	Total
Own	7 (5.8%)	6 (5.0%)	45 (37.5%)	0	58 (48.3%)
Leased	0	4 (3.3%)	58 (48.3%)	0	62 (51.7%)
Total	7 (5.8%)	10 (8.3%)	103 (85.8%)	0	120 (100.0%)

Calculated chi-square value	Degrees of freedom	P value
8.917	2	0.012 (P<0.01) Significant

Source: Primary data

H_0: There is no relationship between the Nature of ownership and the Type of weighing method.

Since the P value is less than 0.01, the difference is significant and hence the null hypothesis is rejected at 1 per cent level of significance. So, we infer that, there is a relationship between the Nature of ownership and the Type of weighing method.

Table 5

Type of organization and type of your aquaculture

Type of organization	Executed pond	Brackish water pond	Sea water pond	Others	Total
Sole	69 (57.5%)	19 (15.8%)	11 (9.2%)	0	99 (82.5%)
Partnership	20 (16.7%)	0	1 (0.8%)	0	21 (17.5%)
Others farm	0	0	0	0	0
Total	89 (74.2%)	19 (15.8%)	12 (10.0%)	0	120 (100.0%)

Calculated chi-square value	Degrees of freedom	P value
6.253	2	0.044 (P<0.05) Significant

Source: Primary data

H_0: There is no relationship between the Type of organization and Type of aquaculture.

Since the P value is less than 0.05, the difference is significant and hence, the null hypothesis is rejected at 5 per cent level of significance. So, we infer that, there is a relationship between the Type of organization and the Type of aquaculture.

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Table 6
Type of organization and number of workers employed

Type of organization	1-10 persons	11-20 persons	21-30 persons	31 and above	Total
Sole	37 (30.8%)	53 (44.2%)	9 (7.5%)	0	99 (82.5%)
Partnership	0	21 (17.5%)	0	0	21 (17.5%)
Others farm	0	0	0	0	0
Total	37 (30.8%)	74 (61.7%)	9 (7.5%)	0	120 (100.0%)

Calculated chi-square value	Degrees of freedom	P value
15.823	2	0.001 (P<0.01) Significant

Source: Primary data

H_0: There is no relationship between the Type of organization and the Number of workers in the aquaculture.

Since the P value is less than 0.01, the difference is significant and hence, the null hypothesis is rejected at 1 per cent level of significance. So, we infer that, there is a relationship between the Type of organization and the Number of workers in the aquaculture.

Table 7
Type of organization Vs type of aquaculture

Type of organization	Executed pond	Brackish water pond	Sea water pond	Others	Total
Sole	24 (20.0%)	0	4 (3.3%)	0	99 (82.5%)
Partnership	65 (54.2%)	19 (15.8%)	8 (6.7%)	0	21 (17.5%)
Others farm	0	0	0	0	0
Total	89 (74.2%)	19 (15.8%)	12 (10.0%)	0	120 (100.0%)

Calculated chi-square value	Degrees of freedom	P value
7.110	2	0.029 (P<0.01) Significant

Source: Primary data

H_0: There is no relation between Type of organization and Type of aquaculture.

Since the P value is less than 0.01, the difference is significant and hence the null hypothesis is rejected at 1 per cent level of significance. So, we infer that, there is a relationship between Type of organization and Type of aquaculture.

Table 8
Type of organization and number of workers employed

Type of organization	1-10 persons	11-20 persons	21-30 persons	31 and above	Total
Sole	0	28 (23.3%)	0	0	99 (82.5%)
Partnership	37 (30.8%)	46 (38.3%)	9 (7.5%)	0	21 (17.5%)
Others farm	0	0	0	0	0
Total	37 (30.8%)	74	9 (7.5%)	0	120

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		(61.7%)			(100.0%)

Calculated chi-square value	Degrees of freedom	P value
22.703	2	0.001 (P<0.01) Significant

Source: Primary data

H_0: There is no relation between the Type of organization and Number of workers employed in aquaculture.

Since the P value is less than 0.01, the difference is significant and hence the null hypothesis is rejected at 1 per cent level of significance. So, we infer that, there is a relationship between the Type of organization and Number of workers employed in aquaculture.

Table 9

Type of organization and type of net used

Type of organization	Conical beg net	Pond net	Pump equipped dragnet	Cast net	Total
Sole	3 (2.5%)	14 (11.7%)	8 (6.7%)	3 (2.5%)	99 (82.5%)
Partnership	12 (10.0%)	6 (5.0%)	63 (52.5%)	11 (9.2%)	21 (17.5%)
Others farm	0	0	0	0	0
Total	15 (12.5%)	20 (16.7%)	71 (59.2%)	14 (11.7%)	120 (100.0%)

Calculated chi-square value	Degrees of freedom	P value
30.247	3	0.001 (P<0.01) Significant

Source: Primary data

H_0: There is no relation between the Type of organization and Type of net used in the aquaculture.

Since the P value is less than 0.01, the difference is significant and hence the null hypothesis is rejected at 1 per cent level of significance. So, we infer that, there is a relationship between the Type of organization and Type of net used.

Table 10

Type of organization and price of aquaculture products

Type of organization	Quality	Availability	Market rate	Others	Total
Sole	7 (5.8%)	4 (3.3%)	17 (14.2%)	0	99 (82.5%)
Partnership	0	7 (5.8%)	85 (70.8%)	0	21 (17.5%)
Others farm	0	0	0	0	0
Total	7 (5.8%)	11 (9.2%)	102 (85.0%)	0	120 (100.0%)

Calculated chi-square value	Degrees of freedom	P value
26.578	2	0.001 (P<0.01) Significant

Source: Primary data

H_0: There is no relation between the Type of organization and Price of aqua products.

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Since the P value is less than 0.01, the difference is significant and hence the null hypothesis is rejected at 1 per cent level of significance. So, we infer that, there is a relationship between the Type of organization and Price of aqua products.

Table 11
Type of product and type of aquaculture

Type of product	Executed pond	Brackish water pond	Sea water pond	Others	Total
Fish	20 (16.7%)	56 (46.7%)	9 (7.5%)	0	99 (82.5%)
Prawn	17 (14.2%)	18 (15.0%)	0	0	21 (17.5%)
Total	37 (30.8%)	74 (61.7%)	9 (7.5%)	0	120 (100.0%)

Calculated chi-square value	Degrees of freedom	P value
9.588	2	0.008 (P<0.01) Significant

Source: Primary data

H_0: There is no relation between the Type of aqua products and Type of aquaculture.

Since the P value is less than 0.01, the difference is significant and hence the null hypothesis is rejected at 1 per cent level of significance. So, we infer that, there is a relationship between the Type of aqua products and Type of aquaculture.

Table 12
Type of product and type of weighing method

Type of product	Size wise	Quantity wise	Weighing machine	Others	Total
Fish	6 (5.0%)	2 (1.7%)	77 (64.2%)	0	99 (82.5%)
Prawn	1 (0.8%)	8 (6.7%)	26 (21.7%)	0	21 (17.5%)
Total	7 (5.8%)	10 (8.3%)	103 (85.8%)	0	120 (100.0%)

Calculated chi-square value	Degrees of freedom	P value
14.026	2	0.001 (P<0.01) Significant

Source: Primary data

H_0: There is no relation between the Type of aqua products and Type of weighing method.
Since the P value is less than 0.01, the difference is significant and hence the null hypothesis is rejected at 1 per cent level of significance. So, we infer that, there is a relationship between the Type of aqua products and Type of weighing method.

6. Suggestions

a. Growing domestic demand within the developing nations for fish can be driven by good governance and the sector ensuring easy availability and economical pricing of per Kg fish protein for increasing the sales.
b. Culture fisheries are more sustainable than of capture fisheries in ecological viewpoint. Aquaculture market is set to witness the growth of about 4% or more in recent times.

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So, the government can show more interest to develop aquaculture in India by encouraging the

c. The organisation of the production must be flexible enough to evolve with the sector, where an industrial vertically integrated organisation has succeeded to an organisation of small scale producers in a state regulated context.
d. It must be powerful and rigorous enough to enforce clear rules in order to avoid free-rider and black sheep behaviours, which would run down the benefits of the organisation.
e. The important step in the development of a marketing plan is forecasting future events. Anticipating what consumers will want in the future and anticipating problems is a corner stone of good management. So, there should be useful forecasts, which are dependent upon a combination of personal forecasting skills, the amount of time available to think about the future and the quality of information regarding aquaculture, which has been previously collected.
f. Management and marketing decisions of fishery and aquaculture producers should be driven by customer needs including latent customer needs. The strategic vision and related goals of the producer should focus on what the customer will be buying rather than what is produced.
g. The government and the development agencies, as well as the aquaculture industry and its trade organisations, adopt four major priorities like1) expansion of the farming of non-carnivorous fish; 2) reduction of fish meal and fish oil inputs in feed; 3) development of integrated farming systems that use multiple species to reduce costs and wastes and increase productivity; and 4) promotion of environmentally sound aquaculture practices and resource management.

7. Conclusion

An environmental policy is necessary to deal with the management of natural resources which are in shared access among farming units or with other industries. Indeed, the exploited biological productivity is a resource in common property, as well as water quality, ecosystem preservation, landscape attractivity or bio-diversity. As long as these resources are plentiful compared to user demand, no rule to limit access is needed and they may remain in free access. But, when the pressure over the resource increases with the multiplication of the enterprises, regulation of access is requested. As for the access to market, the situation of competition exists not only between aquaculture enterprises but also between fisheries and aquaculture and even among all the agricultural activities producing animal proteins. Indeed, from the consumer point of view, substitutions between meat and fish are possible. Aquaculture products will be compared with other products in terms of price and quality and have to be forgotten and requires the definition of common quality standards. These considerations show that, beyond the competition between aquaculture enterprises, a large space for cooperation exists in order to share limited natural resources, limited markets and limited financial supports.

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Biosketch

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