WOMEN IN SMALL-SCALE FISHERIES: THEIR STATUS, PROBLEMS AND PROSPECTS

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2000

Dedicated to

My

beloved parents
wife
&
in-laws

CERTIFICATE

This is to certify that the thesis entitled **"Women in Small-Scale Fisheries: Their Status, Problems and Prospects"** submitted in part fulfilment of the requirements for the degree of **DOCTOR OF PHILOSOPHY in ANIMAL HUSBANDRY EXTENSION** to the Tamil Nadu Veterinary and Animal Sciences University, Chennai is a record of **bonafide** research work carried out by **Mr. N.V. SUJATHKUMAR** under my supervision and guidance and that no part of this thesis has been submitted for the award of any other degree, diploma, fellowship or other similar titles or prizes and that the work has not been published in part or full in any scientific or popular journal.

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(N.V. SUJATHKUMAR)

ABSTRACT

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Women in Small-Scale Fisheries: Their Status, Problems and Prospects

By

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Fishing is one of the oldest occupations of large sections of the population living in the coastal areas of India. The marine fisherfolk are considered as members of an economically disadvantaged community and in particular fisherwomen are reported to have a low status in the social hierarchy. The involvement of women was largely restricted to the household chores and their participation in other activities was practically non-existent mainly due to ignorance of fisherfolk, misconception about the skills of women and about men's superiority. Presently, the fisherwomen are engaged in many small-scale fisheries activities. However, the fisherwomen have to play greater role in the small-scale fisheries sector to earn additional income to their families in order to meet various household demands.

The present study was undertaken to study the involvement of women in small-scale fisheries in the Southern coastal districts of Tamil Nadu, namely, Ramanathapuram, Thoothukkudi, Tirunelveli and Kanyakumari. The specific objectives were to study the profiles of fisherwomen engaged in small-scale fisheries, their awareness, knowledge and extent of participation, relationship between the characteristics of

respondents and their extent of participation, problems, developing suitable training strategies and to explore the possibilities of achieving a better status for them.

A total of 14 coastal villages from these districts were selected based on the maximum population of fisherwomen and from these villages 320 fisherwomen were randomly selected proportionate to its size. The data were collected by personal interview with the fisherwomen using a pre-tested interview schedule.

Most of the fisherwomen were of young age (50.31 per cent). Their educational levels varies from illiterate to collegiate. However, most of them were illiterate and functionally literate (62.27 per cent). Most of the fisherwomen had medium level of social participation status (34.69 per cent), communication status (71.88 per cent), socio-economic status (53.13 per cent), information source exposure (51.56 per cent), risk orientation (53.13 per cent), economic motivation (59.06 per cent), scientific orientation (53.13 per cent) and spouse cooperation (48.13 per cent). The extension system linkage was found to be low (46.88 per cent). The average annual income was roughly about Rs. 19,151/- with the average expenditure of Rs. 16,220/-. They took part in decision making either individually (37.81 per cent) or collectively (30.31 per cent) on various fisheries activities.

About 59.04 per cent of the fisherwomen had well aware of the selected small-scale fisheries enterprises and only about 22.01 per cent of them were not aware of the activities. All the respondents had aware of the selected activities of fisheries development organisations in one way or other. Many of the fisherwomen had medium level of knowledge (67.19 per cent) in small-scale fisheries and the activities of fisheries development organisations. About 53 per cent of the fisherwomen participated in various

small-scale fisheries activities and rest of them did not participate in any of the fisheries activities. About 62.81 per cent of them participated in the activities of fisheries development organisations. Spouse cooperation, social participation status, annual income, socio-economic status and decision making pattern acted as crucial variables and influenced their level of participation in fisheries activities.

The constraints, middlemen (82.50 per cent), procurement of fish and lack of transportation (80.94 per cent), unemployment during off-season (77.19 per cent), lack of good marketing facilities (72.81 per cent), working capital (68.44 per cent), inadequate credit (62.81 per cent), low price (62.19 per cent), higher cost of ice (55.00 per cent) and raw materials (48.13 per cent), limitation of coastal fishery resources (45.31 per cent), inclement weather conditions (31.86 per cent), time allocation for fisheries (30.31 per cent), lack of training (25.00 per cent), technical know-how (19.06 per cent) and regional language fisheries publications (12.81 per cent) were reported by the women. The other problems were liquor addiction by male members (89.06 per cent), inadequate drinking water facilities (67.19 per cent), poor sanitation (61.56 per cent), high cost of education (52.19 per cent), dowry (31.56 per cent), lack of communication (17.50 per cent) and physical strain (15.31 per cent).

The fisherwomen preferred training (in the order of preference) in the areas of hygienic handling of fish and fishery products, preparation of fish/prawn pickles, masmin, dry fish, fish meal, marine shell crafts, shark liver oil, fish wafers, soup powder and seaweed culture. About 68.13 per cent of them preferred peripatetic (off-campus) training programmes. As far as training methods were concerned, demonstration (62.50 per cent) and lecture plus demonstration (77.19 per cent) were preferred by them. About 70 per cent

preferred training during slack season and half of them preferred training for the duration of 5 to 10 days. Fifty per cent of the fisherwomen preferred to have a training group of 15 fisherwomen per training programme.

Preparation of fishery products, fish marketing, fabrication of fishing gear and baskets, opportunities in coastal aquaculture, fisheries training, culture of ornamental fishes in the back yard of their home, establishing small fisheries enterprises, etc., are some of the prospects available for fisherwomen which would lead to improve the status of women engaged in small-scale fisheries.

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INTRODUCTION

CHAPTER - I

INTRODUCTION

India has a coastline of 7,516 kilometres with an Exclusive Economic Zone of 2.02 million km^2. Out of its one billion population, nearly 20 per cent of them live along the coastal areas. There are 11 major ports and a number of minor ports handling shipping to various degrees of intensity. The coastline of the mainland belongs to nine States and two Union Territories. The coastline of the islands of Andaman, Nicobar and Lakshadweep (Laccadives) group of islands constitute nearly 2,000 kilometres. (Subramanian, 1999). Of the marine products export of 385,818 tonnes valued about Rs. 47 billion during 1997-'98, about 310,00 tonnes was from the capture fisheries. In other words, the produce from the capture fisheries contributes essentially to the domestic consumption trade and in some measures to the export trade (Devaraj and Vivekanandan, 1999). Tamil Nadu having 1000 kilometres of coastline and 41,412 square kilometres of continental shelf, accounts for only 15 per cent and 10 per cent of the India's coastline and continental shelf respectively (Department of Fisheries, 1998).

The marine fisherfolk population in Tamil Nadu was about 8.53 lakhs and out of which 2.62 lakhs were active fisherfolk. The registered fishing crafts like mechanised boats, vallams and catamarans were about 9,896, 16,862 and 25,675 respectively. There are about 444 Fishermen and 144 Fisherwomen Cooperative Societies are available in the state. About 3.38 lakhs of fisherfolk are presently members of these societies and out of which 0.44 lakhs are members of Fisherwomen Cooperative Society. There are about 442 marine fishing villages and about 362 marine fish landing centres available in the state. The total

marine fish production for the year 1997-1998 was about 3,56,49,000 tonnes. Tamil Nadu exported Rs. 1220.05 crores worth of marine products during the year 1997-'98 (Department of Fisheries, 1998).

Fishing is one of the oldest occupations of a large section of the population living in the coastal areas. The Indian fisheries sector provides gainful employment to over 1.75 million skilled and unskilled persons in different activities (Department of Fisheries, 1998). The development of fishing and allied industries has a special significance because this sector is eminently suited to be useful to a large mass of backward and economically weaker sections of the rural community.

The fisheries industry consists of large-scale and small-scale sectors. The wild capture fish production from the both sectors varies from country to country. However, in terms of number of fisherfolk, evidence shows that the majority of the fisherfolk are engaged in the small-scale fisheries sector. Several seminars and workshops related to small-scale fisheries have contributed much to arrive at a standard definition of small-scale fisheries.

The Southeast Asian Fisheries Development Centre (SEAFDC) defines small-scale fisheries in terms of the possession of a fishing boat, ranging from those without a boat, having a non-powered boat or an out board or an inboard powered boat of less than 8 meters' in length (Yamamoto, 1982).

Small-scale fisheries uses low technology gear, small boats and is generally oriented towards local markets. It is a labour-intensive form of fishing outside of urban areas and the average catches per fisherfolk are small. The small-scale fisheries sector is a

dominating feature of the fishing industry in Southeast Asia (Juntarashote and Daosukho, 1986). Small-scale fisheries operations including fish farming are undertaken both in marine and inland waters. It depends on the scale of operation, the type of technology used, the degree of capital intensity, employment generation and the nature of ownership. In small-scale fisheries, the boat owners operate using comparatively low capital, employing traditional methods of fishing. The artisanal fisheries are usually characterized by irregular catch rates, limited fishing range and precariousness of income levels. A small-scale fishery typically consists of a single unit, owned or hired by a fisherman / fisherwoman or a fishing family.

Women since time immemorial have formed as an organic component of the working force. They undertake many works in addition to their normal domestic chores. Thus, women play a dual role in the society. Women still remain pitiful due to non-recognition of their work in economic development, though they play significant role in economic development. It was reported that if the women were paid for domestic work and childcare, their wages would account for half of the national income (Ahilan, 1988). The most important problems faced by the women are poor health and lack of education, malnutrition and repeated childbearing which ultimately affect their economic generating activities.

In no society, today, do women enjoy the same opportunities as men. This unequal status leaves considerable disparities between how much women contribute to human development and how little they share in its benefits. It is true that, the past two decades have seen unprecedented human development efforts contributing greatly to rapid progress in building women's capabilities and in closing gender gaps in those capabilities.

Despite this progress, a widespread pattern of inequality between women and men persists in their access to education, health and nutrition and even more in their participation in the economic spheres. Women now share more in the benefits of social services, both public and private - but continue to be denied equal opportunities for economic participation.

The declaration of women's decade (1975-1985) by the United Nations influenced nations everywhere to integrate women in the national development process. The Government of India also recognised women's participation as a key factor in the total development process of the country. Since 1975, it has initiated a number of programmes to integrate women in the economic development (Dandekar, 1982). The social and voluntary organisations play a greater role to help the government in its endeavour to make women stand on their feet and fully participate in the nation building task. Women everywhere, whether it was among the minorities, backwards and weaker sections or in the affluent class, were discriminated against men and have a tough time in life. The problems besetting development and the nation building process could not be overcome without the effective participation of women, who form about 50 per cent of the total population.

The most effective step towards equal status for women is through earning of their own income so that they can make a distinct contribution towards meeting the needs of the households. The high rate of illiteracy and low economic status of the women stress the need for greater attention to their economic emancipation. The deep seated traditional value system, emphasising the subordination and dependence of women on men could be changeable, when women become aware of the modern value system, professing quality, independence and individuality. Moreover, women in general, are regarded as one of the vulnerable sections of the society. Although the vast majority of rural population is under-

privileged, the women are the poorest of the poor and the conditions of those belonging to tribal and fishing communities are precarious. However, the number of women exposed to modern changes are meagre.

At present the fisherwomen are engaged in procuring, selling the fishes from mechanised and non-mechanised catches, and they are also participating in many fisheries related activities such as drying of fishes, net making, etc. They are also actively involved in fish processing, marketing, fish culture and in some cases in handpicking of prawn.. The income that they could get out of these practices is, however, low. During off-season, leading their day-to-day life is difficult.

There is no development of fisheries without the development of fisherfolk. So in the fisheries sector, it is necessary to ascertain the felt needs and priorities of women to reorient national policies and to allot adequate funds for positive changes benefiting women, in view of their contribution to fisheries development. The present study, therefore, was taken up with the following objectives:

i) to study the profile of women engaged in small - scale fisheries

ii) to study their awareness, knowledge and extent of participation in small-scale fisheries and fisheries development organisations

iii) to study the relationship between the characteristics of the respondents and their extent of participation in small-scale fisheries and in the activities of fisheries development organisations

iv) to identify the constraints faced by the respondents in small - scale fisheries

v) to develop a training strategy for women engaged in small-scale fisheries and

vi) to explore the possibilities of achieving better status for women in small - scale fisheries.

Scope of the study

The study would enlighten the characteristics of women, their extent of participation in small-scale fisheries and in fisheries development organisations. The result would thereby help the extension personnel to modify or develop programmes for their betterment. The findings would also help to understand the extent of participation of women in various fisheries development activities and the relationship of their characteristics with their participation and their training needs. Thus, this investigation would provide a basis for planning appropriate training strategies besides getting an idea about the constraints and prospects of small-scale fisheries. The result emerged by this investigation would help the planners and the policy makers to take appropriate steps for small-scale fisheries development.

Limitations

There were constraints of time and resources which resulted in limiting the scope of the study. The study was confined to four southern coastal districts of the Tamil Nadu State covering only 14 coastal fishing villages. The researcher personally and individually contacted the fisherwomen. It was a herculean task to make them willing to answer the questions in the interview schedule. The fisherwomen expressed unwillingness for several questions. However, with great difficulty their responses were obtained by paying sincere and thoughtful attention to bring out several distinct features of small-scale fisheries in a comprehensive way covering various facets of fisherwomen engaged in small-scale fisheries activities. Since fisherwomen's status and their involvement in small-scale fisheries and in the activities of the fisheries development organisations vary from place to

place, some of the results could be applicable only to the area where similar situation is prevailing. However, there is scope for further research in this area with more emphasis on each aspect of small-scale fisheries.

Organisation of the thesis

The thesis is organised into the following chapters

Chapter - I	:	Introduction
Chapter - II	:	Review of literature
Chapter - III	:	Research methodology
Chapter - IV	:	Results and discussion
Chapter - V	:	Summary and conclusions

REVIEW OF LITERATURE

CHAPTER - II

REVIEW OF LITERATURE

The primary objectives of the present study are to find out the awareness, knowledge, extent of participation, relationship between the characteristics of respondents with their extent of participation and constraints in participation of women engaged in small-scale fisheries. Available literatures, therefore, were perused in relation to the objectives set forth for the study. As fisheries is different from other fields, the literatures pertaining to fisheries were collected so as to have a clear idea on fisherwomen in small-scale fisheries. The literatures collected are presented in the following heads:

2.1 Profile of the women engaged in small -scale fisheries

2.2 Awareness and knowledge of women in small-scale fisheries and the activities of fisheries development organisations.

2.3 Extent of participation

2.4 Relationship between the characteristics of respondents and their extent of participation

2.5 Constraints in the participation of small-scale fisheries

2.6 Certain aspects of training

2. 1. Profile of the women engaged in small -scale fisheries

2. 1. 1. Age

Ahilan (1988) reported that about 22 per cent of the fisherwomen were belonged to the age group of 22 - 30 years.

Varambally (1998) revealed that 75 per cent of the fisherwomen were within the age group of 35 - 55.

Roy (1993) reported that all the fisherwomen respondents were below the age of 35.

Sharma (1998) observed that the fisherwomen aged around 31 years.

Soundararajan and Renuka (1998) stated that the majority of respondents belonged to the age group of 20 to 30 years.

Sujathkumar (2000) reported that most of the fisherwomen were under the middle-aged group (59.00 per cent).

2. 1. 2. Socio-economic status

2. 1. 2. 1. Education

The literacy level of fisherwomen was found to be low (Karunaanbarasan, 1985).

Sehara *et al.* (1986) stated that majority of the fisherfolk were illiterate (60 per cent). Persons with primary, middle, higher secondary, graduate and above qualifications were 31 per cent, 4 per cent, 4 per cent and 1 per cent respectively.

Venkataramanujam *et al.* (1987) reported that all the adult females and 95.7 per cent of the males were illiterate.

Ahilan (1988) observed that about 41.01 per cent of the respondents were educated upto primary school level and 23.82 per cent of them were studied upto higher secondary level. The illiterates were less than 11 per cent.

Gupta and Srinath (1992) found that about 45.73 per cent of the fisherwomen had education upto primary level, 29.92 per cent upto secondary level, 14.35 per cent had education upto higher secondary level and only 2.22 per cent of them had education above the matriculation level

According to Sheela (1995) 33 per cent of the respondents had primary level of education followed by high school (27 per cent) and secondary education (20 per cent).

Sharma (1998) observed that most of the fisherwomen were illiterates.

Soundararajan and Renuka (1998) stated that about 88 per cent of the respondents had S.S.L.C., qualification.

Sujatha (1999) reported that 90 per cent of fisherwomen were predominately illiterates.

Sujathkumar (2000) reported that about 62 per cent of them were found to be functionally literate and the rest of them were illiterate.

2. 1. 2. 2. Communication status

Kiron (1992) observed that most of the respondents did not have the habit of reading newspapers.

Ahilan *et al.* (1996) found that majority of the fisherwomen families did not subscribe newspapers.

Sujathkumar (2000) found that about 89.50 per cent of the fisherwomen did not subscribe newspaper, weekly and monthly magazine, etc.

2. 1. 2. 3. Family status

Tempelman (1987) found that the majority of the families were nuclear and have an average of five family members.

Venkataramanujam *et al.* (1987) reported that the percentage distribution of males and females were 51.9 per cent and 48.1 per cent respectively. Children constituted 43.5 per cent and adults 56.5 per cent. Eighty five per cent of them had Kuchcha houses and 15 per cent of them had semi-pucca houses.

Sujathkumar (1988) reported that nearly one-third of the traditional fisherfolk were lived in thatched house (38.88 per cent) and half of the total respondents were lived in tiled house.

Sathiadhas and Panikkar (1991) reported that 90 per cent of the fisherfolk were dwelling in huts.

Sambennet and Arumugam (1993) reported that majority of the small-scale fisherfolk had hut type of house.

Sathiadhas *et al.* (1994) reported that 51 per cent of the fisherfolk at Mallipattinam and 42 per cent at Keechankuppam were living in huts.

According to Sheela (1995) majority of the respondents (70 per cent) had nuclear families and the average family size was 5.

Sujathkumar (2000) reported that about 23.20 per cent of the fisherfolk were living in tiled house.

2. 1. 2. 4. Fisheries power status

Sehara *et al.* (1986) stated that 37 per cent of the fishermen families had full ownership and 63 per cent of them had partial ownership of boats. In case of gears, 81 per cent of families had full ownership, 31 per cent had partial ownership and 6 per cent had leased-in.

Gupta and Srinath (1992) found that about 100 fishing crafts were owned by 65 families which includes plank built boats and dugout canoes. About 27 per cent of the families operated dugout canoes and 57 per cent plank built boats. The most widely used fishing nets were Thanguvala followed by Neetuvala, Veesuvala and Chudavala. Presently they aspire to own ring nets which they perceived as most effective.

Sujathkumar (2000) observed that majority of the fisherwomen families had ownership of crafts like catamaran, motorised catamaran, vallam and different types of fishing nets.

2. 1. 2. 5. Material status

Tempelman (1987) found that nearly half of them did not posses any assets for independent fishing

Ahilan (1988) observed that most of the fisherwomen were possessed radio for hearing weather warning and entertainment activities.

Sujathkumar (1988) observed that the traditional fisherfolk had medium level of material possession.

Only 37 per cent of them owned radio and 3 per cent of them had television. (Sheela, 1995)

Sujathkumar (2000) reported that all the fisherwomen had radio and some of them possessed colour television which was used mostly for entertainment.

2. 1. 2. 6. Occupational status

Ahilan (1988) found that the main occupation of fisherwomen was fish trade and some of them were also engaged in non-fishery related jobs.

James *et al.* (1991) reported that 61.94 per cent of the fisherfolk were engaged in fishing activity.

Sivasubramaniam (1991) reported that 79 per cent of the fisherfolk household members were engaged in fishing.

Ruthcrossan (1993) reported that approximately 80 per cent of the fisherwomen households pursue some sort of agriculture activity as well as fishing and rest engage solely in fishing.

Sambennet and Arumugam (1993) reported that fishing was the major occupation fisherfolk.

Sathiadhas *et al.* (1994) reported that 72 per cent of the fisherfolk were engaged in active fishing.

Rao (1995) observed that the fisherwomen work as agricultural labourers occasionally in neighbouring villages and in the absence of male workers, the female heading the households engage themselves in fish trade (both fresh and dry) and other economic pursuits with the help of money lenders.

Sujathkumar (2000) expressed that about 81.60 per cent of fisherwomen had fishing related activities as their main occupation.

2. 1. 2. 7. Social participation status

Sehara *et al.* (1986) expressed that about 80 percent of the heads of the families were members of Fishermen Co-operative Society.

Participation of fisherwomen in Mahila Mandal alone was reported (Ahilan, 1988). Of the 120 fisherwomen, only 2 had reported as office bearer and 13.33 per cent of them were members of Mahila Mandal. Participation of fisherwomen in other organisations like fisherwomen cooperative societies, grama panchayat, and working women's forum was not reported.

Sujathkumar (1988) stated that the social participation was high among the traditional fisherfolk.

Ahilan and Selvaraj (1990) reported that the fisherwomen were found to participate only in the activities of the Mahila Mandal. Although membership was poor, it was, however, found that by and large, most of them participated actively and made adequate use of the Mahila Mandal.

Sujathkumar (2000) observed that about 28 per cent of the fisherwomen were members of the fisherwomen cooperative societies.

2. 1. 3. Size of labour force

Tempelman (1987) found that the majority of the fisherwomen families had an average of 5 family members.

Ahilan (1988) observed that the average size of labour force was 2 - 8 for about 42.45 per cent of the fishing families.

Sathiadhas and Panikkar (1989), Sathiadhas *et al.* (1994) and Sheela (1995) reported that the average size of fisherfolk household was about 5.

Roy and Dorairaj (1998) reported that the average family size ranged between 4 and 6.

2. 1. 4 Experience in small-scale fisheries

Sujathkumar (1988) and Veeraputhiran (1988) reported that most of the fishing families had high level of experience in fisheries activities.

Kiron (1992) observed that the respondents had experience for more than 4 years in fisheries activities.

Sujathkumar (2000) found that about 49 per cent of the fisherwomen had experience for more than 15 years, about 38 per cent of them had 10 - 15 years and about 13 per cent of them had experience upto 10 years in fisheries activities.

2.1.5. Annual income

Sehara *et al.* (1986) stated that the average annual net fishery income per fisherfolk family was calculated at Rs. 5,313.

The main source of income of fisherwomen was fishing and fishing related activities (Mammo, 1987).

Tempelman (1987) found that women contributed to the family income either by marketing fish caught by their husbands or by marketing fish purchased from others or by engaging on other activities. He further has recorded that the average weekly income was around Rs. 120. Eighty per cent of the households were indebted for an amount varying between Rs. 1,980 and Rs. 4,270.

Venkataramanujam *et al.* (1987) reported that about 41.4 per cent of the households had income ranging from Rs. 1,212 to 2,400 per annum by gainful activity.

Ahilan (1988) observed that the average income of fisherwomen families was about Rs. 3,473 per annum.

Srinath and Thangamani (1992) reported that the annual income of the fishing household ranged from Rs. 2,500 to 3,500 of which 80 per cent was spent on food.

Sujathkumar (1988) reported that the average annual income of traditional fisherfolk ranged from Rs. 4986 to 12,647.

Sambennet and Arumugam (1993) reported that the income of majority of the small-scale fisherfolk ranged from Rs. 400 to Rs. 700 per month.

Ahilan *et al.* (1997) found that the average annual income from the fishing was found to be Rs. 7,200 - 14,600.

Sharma (1998) observed that the average monthly income of fisherwomen was about Rs. 781/-.

Soundararajan and Renuka (1998) stated that only 4 households had an annual income between Rs. 10,000 and Rs. 20,000 and 12 respondents had an income between Rs. 8,000 and 10,000.

Sujathkumar (2000) reported that the annual income of fisherwomen family ranged from Rs. 14,000 to Rs. 21,000.

2. 1. 6. Annual expenditure

Mammo (1987) reported that eighty per cent of their earning was spent on non-productive expenses such as food, clothing, medicine, etc.

Soundararajan and Renuka (1998) observed that that the lower income group borrowed money from friends, relatives and money lenders in order to meet their household expenses.

Sujathkumar (2000) stated that about 62.75 per cent of the annual income goes to household expenditure which includes food, clothing, education, medical, travel, recreation and entertainment.

2. 1. 7. Information source exposure

Sujathkumar *et al.* (1992) reported that as a source of information radio and newspapers were utilised only 30 per cent of the respondents. Literature was not used as a source of information. Friends and relatives were the predominant source of information for about 55 per cent of the respondents.

According to Sheela (1995) about 13 per cent of the respondents were used radio as a source of information and newspapers were read by 30 per cent of the respondents for gathering day-to-day information.

2. 1. 8. Extension system linkage

Ahilan (1988), Sujathkumar (1988) and Kiron (1992) reported that the contact of fisherfolk with the extension organisations was very low.

Sujathkumar *et al.* (1992) reported that due to limited extension work, the contact with the extension and research personnel was found to be almost nil.

Sujathkumar (2000) found that about 16.80 per cent of fisherfolk contacted the extension personnel for knowing information on fisheries. . However their contact with the extension system was very low.

2. 1. 9. Risk orientation

Nagoormeran (1983) stated that most of the fisherfolk had medium to high level of risk orientation.

Ravaneswaran (1989) reported that fisherfolk had high level (37.00 per cent and low (36.00 per cent) level of risk orientation.

Kiron (1992) found that majority of the respondents had low to medium level of risk orientation.

Sujathkumar (2000) observed that about 41.60 per cent of the fisherwomen had medium level of risk orientation.

2. 1. 10. Economic motivation

Sehara *et al.* (1986) reported that 20 per cent of the fishermen families did not avail loan from any source and the rest had availed loan from Fishermen Cooperative Society (40.4 per cent), Government (10.4 per cent), Nationalised banks (10 per cent) and private agencies (21.8 per cent).

Their major source of credit was banks and cooperative societies and few of them availed loan from money lenders, middlemen and boat owners (Mammo, 1987).

Tempelman (1987) stated that the fisherwomen were interested in obtaining bank loan but they were either not familiar with the procedures or found them cumbersome. Majority took loans from relatives or friends at varying rates of interest.

Venkataramanujam *et al.* (1987) found that about 83.40 per cent cases, the source of loan was private money lenders for the household purposes and fishery enterprises.

2. 1. 11. Scientific orientation

Kiron (1992) reported that majority of the respondents had low level of scientific orientation on fisheries activities.

Ahilan (1999) observed that about 56.60 per cent of the fisherfolk had low level of scientific orientation.

Sujathkumar (2000) reported that about 64.00 per cent of the fisherwomen had low level of scientific orientation. The respondents who had high level of scientific orientation were only 11.20 per cent.

2. 1. 12. Decision making pattern

Karunaanbarasan (1985) reported that fisherwomen generally made decisions related to home management in consultation with the male head of the family and they were not involved in making any decisions concerning purchase of production assets and related issues. Fishermen invariably made the decisions regarding village's public matters.

Daniel (1986) found that women in 90 per cent of the cases made decision on expenditure of food. But with regard to the expenditure on clothing, joint decisions were mostly reported. Women dominated in taking decisions on almost all the household activities. According to him even in the case of taking up employment by the fisherwomen, the decisions were made upto 65 per cent by the male heads of family. Similarly, for fisherwomen to become a member in a cooperative society it was decided by the men only. Generally, fisherwomen were not involved in decision making on economic activities.

Fisherwomen were consulted by the menfolk in the future of children, expenditure and medical care of the family members.

Tempelman (1987) found that decisions on important family matters, one-third of the women reported that their husbands took the decisions without consulting them, while 25 per cent of them reported that they were consulted. In the remaining household decisions on major issues were often taken jointly.

Ahilan (1988) observed joint decision making role by women and fishermen in fisheries activities.

Sujatha (1999) found that the fisherwomen relegated status in decision making.

Sujathkumar (2000) reported that the fisherwomen were actively participating in decision making especially on fish marketing (91.00 per cent), money lending and borrowing (81.00 per cent), net purchasing (69.00 per cent) and auctioning (59.00 per cent).

2. 1. 13. Spouse cooperation

Sukumar *et al.* (1992) concluded that the menfolk of the fisherwomen families must be motivated to extend full cooperation to their spouse trained in fisheries enterprise management to earn additional income to the family.

Sujathkumar (2000) observed that about 79 per cent of the fisherwomen had good cooperation from their spouse in getting financial assistance from money lenders, friends and relatives. About 76 per cent of the fisherwomen had cooperation in

transportation of fish catches to the nearby markets through bicycles. About 69 per cent of them received cooperation on household matters.

2. 2. Awareness and knowledge of women in small-scale fisheries and the activities of fisheries development organisations

Sukumar *et al.* (1987a) revealed that the majority of the respondents were aware of fisheries post harvest technologies like the preparation of fish and prawn pickles, masmin, fish wafers, etc., and had sound knowledge in dry fish preparation technique. Only few respondents had practical knowledge in the preparation of fish pickles, masi, fish oil and fish meal.

Veeraputhiran (1988) found a significant difference in the knowledge level of fisherwomen. About 66.67 per cent of fisherwomen possessed medium level of knowledge while 21.97 per cent of them had high level of knowledge in the preparation of value added fishery products.

Gupta and Srinath (1992) found that a significant level of increase in the knowledge level of fisherfolk after the training programme. The impact of demonstration on scientific prawn culture brought desirable changes in their level of knowledge and understanding.

Sheela (1995) concluded that 57 per cent of the fisherwomen were found to have medium level of knowledge while 37 and 6 per cent of them had high and low knowledge in seaweed utilisation respectively.

Ahilan (1999) reported that about 52.13 per cent of the respondents were aware of small-scale fisheries enterprises and the activities of the fisheries development organisations. However, their knowledge level on its various aspects was comparatively low.

2.3. Extent of participation

Tempelman (1985) found that in two out of three fisherwomen households, women undertook income earning activities and majority of them (70 per cent) in fish marketing.

Anbarasan and Fernandez (1986) conducted a study on credit for fisherfolk which revealed that the life of the average fisherwomen was found to be tough. She has to do all the household chores and assist in removing fish from nets at the landing site. Most of the women were engaged in fish handling and marketing.

Natpracha (1986) reported that the fisherwomen had earned money from activities like net making and the raising of fowls, goats and ducks.

Jegatheesan (1987) found that the fisherwomen were generally engaged in net making, net mending, fish handling, dry fish preparation and fish marketing.

Srinath (1987) reported that about 20 per cent of respondents participated in fishery related activities and the major areas of participation were prawn peeling, curing, drying and trading of fish, net making, fishing in canals and clam shell collection. In prawn peeling and net making, women of younger age groups had better participation.

Sukumar *et al.* (1987a) stated that the fisherwomen were participating both in fishery-related and non fishery related activities. The fishery related activities were fish marketing, fish drying /curing, shrimp processing, net making / mending, fish culture, hand picking of prawns, collection of seaweeds, etc. On the other hand a fewer percentage of fisherwomen engaged themselves in tailoring, handicrafts, coir making, weaving, collection and selling of firewood, small business, etc.,

Sukumar *et al.* (1987b) found that almost 50 per cent of the fisherwomen were participating in fishery related activities which included fish marketing, fish drying, net making, shrimp processing, hand picking of prawn and collection of seaweeds.

Women spent about 50 per cent of their time on household chores (Tempelman, 1987). Women engaged in fish marketing between 7 and 10 hours a day and 5 to 7 days a week.

According to Yap (1987) women's participation in marine fisheries was confined mainly to shore-based activities, such as net making, fish handling (sorting, weighing, gutting and icing), fish trade, distribution and processing.

Sanjeeviraj *et al.* (1991) reported that about 50 per cent of the fisherwomen were engaged in the preparation of fishery by-products like fish and prawn pickles, fish wafers, masmin, fish soup powder, etc.

Alagarswamy (1992) opined that women had always been involved in various aspects of marine fish production and marketing. As far as coastal aquaculture was concerned their involvement had only been marginal and the role of women in coastal aquaculture in India was: collection of prawn seed from estuaries and backwaters, labour in

pond construction, management of small ponds in the confined water prawn culture system, collection of lands snails from agricultural fields for feeding pawns, artisanal feed preparation in some areas for pond culture of prawn, attaching seed to ropes in mussle culture, nucleus implantation in pearl culture, net making and fabrication of cages and technical help in commercial shrimp hatcheries.

Nair and Kandoran (1992) stated that many trained women have formed societies in different parts of Kerala for the production and marketing of fish wafers, pickles, cutlets and dried fish. About 94 per cent to 98 per cent of the women were trained in the preparation of pickles and cutlets and 60 per cent to 70 per cent of those trained in the preparation of wafers and dried fish begun production, but none of them trained in the preparation of soup powder or shark fin rays had started the production of these items.

Nayak (1992) found that the women participated generally in fish marketing and making nets.

Vijayan (1992) observed that the fisherwomen participated in marketing of fish through house to house sale, licensed markets and unlicensed markets/ hawking.

Ruthcrossan (1993) found that an approximately 80 per cent of the households pursued some sort of agricultural activities and fishing, while the rest engaged solely in fishing. Most of them had fishing in the estuarine waters and the catch was largely shrimp, mud crabs and miscellaneous marine fish. Fisherwomen marketed the catch locally.

Amalore (1996) identified various occupations in which women fisherfolk engaged. Those were net making from tall grass, shell craft-ornament from sea shells,

agriculture, cattle rearing, basket making from bamboo, small entrepreneurship (running a shop retailing), weaving (patterns for bags), tailoring and chicken rearing.

Gopalakrishnan (1996) reported that although women were not conspicuous in the formal institutional sector, their role in coastal shrimp farming was quite significant. They were involved in various facets of shrimp farming, including pond construction, seed collection, collection of feed materials and preparation of feeds, pond maintenance and post-harvesting.

Sujatha (1999) found that the fisherwomen were participated in fish auctioning, sun drying, salt curing, wild shrimp seed collection, processing of shrimps, production of smoked fish and fish marketing.

2. 4. Relationship between the characteristics of respondents and their extent of participation

Kaul *et al.* (1987) reported that the education and income were found to be positively related to the intensity of the training need and participation while age, size of family, number of earners had negative relationship.

Veeraputhiran (1988) stated that social participation, contact with extension agency, media participation, scientific orientation, and economic motivation had positive and significant relationship with training needs and participation.

Kiron (1992) concluded that age, educational level, social participation had positive relationship with their training needs and participation in fisheries activities.

Ahilan (1999) reported that age and income levels were found to have positive relationship with participation.

2. 5. Constraints in the participation of small-scale fisheries

Balasubramaniam and Kaul (1985) reported that in the adoption of improved fishing technologies the fisherfolk experienced financial constraints (63.75 per cent), not knowing of some of the technological practices and their economics (36.25 per cent), non-availability of adequate kerosene to out board engines at controlled price (35 per cent) increase in maintenance expenditure of outboard engines (18.75 per cent), chances of getting lower price for catch and the uncertainty in prices during sale (13.75 per cent).

Lack of improved transport facilities, ice supply to the village, credit for fish marketing and alternative income opportunities during the lean fishing season were some of the problems faced by them (Drewes, 1986).

Sukumar *et al.* (1987a) reported that low level of literacy, limitation of time and lack of skill were some of the important factors that caused lower level of participation of fisherwomen in economic activities.

Vasanthakumar (1987) concluded that low catch, frequent damage to gears, inadequate fuel supply, inadequate credit and inadequate service facilities were certain difficulties faced by the fisherfolk.

Venkataramanuajm *et al.* (1987) opined that enough attention was not paid to afford alternative employment during the off season for fisherfolk engaged in chank fishing. There was lack of organised local agency to support their operations and marketing of their

produces. Financial difficulties acted as a constraint for the developmental effort. Lack of technical know-how and information about the biological conditions of the sea prevents them from having a good catch and also reported that the fisherfolk engaged in chank fishing were economically weak and live below the poverty line.

Ahilan and Selvaraj (1990) stated that the problems faced by the respondents could be broadly classified into household and social categories. Problems in finance and marketing were reported by 7.5 per cent and 11 per cent of the respondents respectively.

Bhaumik *et al.* (1990) identified the socio-economic problems of women which impeded their participation in various fisheries activities. The problems faced by them were non-availability of finance (49.3 per cent), lack of knowledge (15.00 per cent), family poverty (12.1 per cent), pressure on household work (9.4 per cent), physical weakness (3.9 per cent), social taboo (3.6 per cent) and family conservation (2.2 per cent).

Nair and Kandoran (1992) concluded that fisherwomen had many constraints in the establishment and functioning of small-scale production units such as lack of marketing facilities and information about potential markets, inadequate training facilities and finance, scarcity of fish and high cost of raw materials, low prices of finished products in the market, lack of community processing centres with proper facilities, lack of transport facilities and lack of coordination and communication among various departmental agencies.

Srinath and Thagamani (1992) reported that fisherwomen throughout the country faced hardship, mainly economic in nature. There was a little protection of wages or employment, as small-scale fisheries were usually managed on unwritten rules. Basic facilities such as housing, hygienic drinking water and health services were often lacking.

Vijayan (1992) reported that the women fish vendors faced many constraints like illiteracy, lack of time and extreme situations of poverty.

Rajkumar *et al.* (1995) reported that the real value of the fish catches was not paid to the fisherfolk due to middlemen.

Rao (1995) observed that the fisherwomen were totally uneducated and imbued with abundant feelings of religious and superstitious believes. They could not avail opportunities in modern fishing to their best advantage due to poor skills and lack of training.

Ahilan *et al.* (1996) reported that due to the risk prone and seasonal nature of the fishing occupation, the fisherfolk had to live in poverty apart from their habit of addiction to the liquor and large family size.

The major problem reported by 100 per cent of the respondents was physical strain (Sheela, 1997). Majority (60 per cent) of them expressed that they were not allowed to stay in the islands to collect the seaweeds for 2 to 3 days continuously and due to this they travel back the same day, which caused physical strain. About 60 per cent of them stated that unfavourable weather condition was a problem making them to remain unemployed during the period. Low price and poor quality seaweeds were perceived as a problems by 58.30 per cent of them. Lack of adequate place for drying the seaweeds was perceived by 40 per cent of them. Taking care of children and other household activities were the other problems faced by 50 per cent of them.

Sujathkumar (2000) stated that liquor addiction by spouse (78.00 per cent), less credit facilities (66.00 per cent), middle men (63.00 per cent), non -availability of good marketing place (56.00 per cent) and less transportation facilities (41.00 per cent) were reported by the fisherwomen as major constraints.

2. 6. Certain aspects of training

Drewes (1985) had expressed that the fisherwomen could compete their counterparts on better terms by adequate training. He had emphasised the need for training fisherwomen in income generating activities such as fishery product preparation and by-product development, fish marketing, etc.

Thiagarajan *et al.* (1988) reported that lecture with slides followed by lecture with charts and lecture alone were effective extension training methods in educating the fisherwomen.

Veeraputhiran (1988) found that fisherwomen preferred training in the preparation of shark fin ray, fish soup powder, fish icing glass, masmin, fish flake, fish pickle, fish murukku, fish liver oil and fish meal. They also preferred training during January - September. More than 50 per cent of the fisherwomen preferred to have 11-15 days of training and about 76.50 per cent of them preferred off-campus training. Group discussion, field trips, demonstrations were considered as the most liked methods of training by fisherwomen.

Kiron (1992) reported that lecture cum demonstration was the best method for training the fisherwomen in the preparation of value added fishery products. They also preferred training only during lean season for a duration of 5 to 10 days.

Nair and Kandoran (1992) reported that lecture with slides was the most effective training method, followed by lecture with charts and lecture alone on the preparation of fish wafers and fish pickles.

Sukumar *et al.* (1992) opined that married women aged between 25 and 40 with minimum of high school education may be preferred for training and trained women extension officers and workers should be preferred for providing training to fisherwomen

Sheela (1995) reported that lectures and demonstrations were found suitable for training the fisherwomen.

Nandeesha (1996) recommended that women should be given training in fish processing and marketing and in aquaculture because their work dominated in these subsections.

Ahilan (1999) observed that about 271 persons expressed the need for training in fish processing, 103 in net mending, 32 in coastal aquaculture and 78 persons evinced interest in non-fisheries activities. The fisherwomen were much interested to undergo training in the preparation of value added fishery products like fish and prawn pickles, fish wafers, fish soup powder, masmin, etc. In coastal aquaculture practices, majority of them expressed their desire to undergo training in shrimp farming practices. About 70 per cent of the fisherwomen evinced interest to undergo training in non-fisheries activities like tailoring. Younger fisherwomen and economically poor had shown more interest in the training programmes. Majority of the fisherwomen preferred off-campus cum demonstration methods of training and they were much interested to undergo training during slack fishing season.

RESEARCH METHODOLOGY

CHAPTER - III

RESEARCH METHODOLOGY

This chapter deals with the selection and description of the study area, sampling procedure, selection of variables and their measurement, selection of small-scale fisheries and activities of fisheries development organisations, data collection and statistical tests used in this study.

3. 1. Selection of the study areas

The four southern coastal districts of Tamil Nadu namely, Ramanathapuram, Thoothukkudi, Tirunelveli and Kanyakumari were purposively selected for the study because these districts cover more than half (510 km) of the total coastal length of Tamil Nadu and other seven districts account for only 490 kilometres out of 1000 km. These districts are endowed with potentials for small-scale fisheries activities. The total marine fish landing from small-scale fisheries was also high in these districts compared to other six coastal districts.

3. 2. Description of study area

Since, majority of the womenfolk are involved in small-scale fisheries in the study areas, their involvement in fisheries and the activities of fisheries development organisations are to be studied in detail based on the physical and economical environments. A brief description of the study area, therefore, is presented in this chapter.

3. 2. 1. Ramanathapuram district

Ramanathapuram district is bounded on north by Sivagangai, west by Virudunagar, south by Thoothukkudi districts and east by Gulf of Mannar. The total fisherfolk population is 1.94 lakhs including 0.46 lakh of active fisherfolk. During the off-season, the fisherfolk families migrate to other regions. The total coastal length of the district is 271 kilometres accounting for about 27.10 per cent of the state's coastal length (Department of Fisheries, 1998). The fishermen and fisherwomen cooperative societies are also functioning in this district. There are 99 fishing villages and four fishing harbours in the district. Ramanathapuram is district headquarters of this district.

Among the fishing crafts viz., catamaran, plank-built canoes and mechanised boats are commonly used. Trawlers are used for fishing in the off-shore waters (10 -30 Km). Trawls, gill nets, seine nets, hook and lines, etc., are the commonly used fishing gears. There are 27 cyclone shelters in this district and good market facilities for fish are available only in selected fishing villages. Primary and middle schools are present in some fishing villages. Drinking water facilities, post office, nationalised banks, shops, communications facilities, etc., are also available but not adequately.

3. 2. 2. Thoothukkudi district

Thoothukkudi is the 20th district in Tamil Nadu and it covers an area of 4,635 Km^2, accounting for 3.53 per cent of the total geographical area of the state. The district is surrounded by Virudunagar and Ramanathapuram districts on the north, Kanyakumari district on the south, Gulf of Mannar on the east and Tirunelveli district on the west. This district has a coastal length of 121 kilometres accounting for 12.10 per cent of the state.

According to 1991 census, the total population of the district was 13,50,581 accounting for 2.79 per cent of the total population of the state. The density of population is 291 per sq. km as against the state average of 372. The literacy percentage of 54.60 is higher than the state average of 46.76. This district has 19 fishing villages distributed all along its coast (Department of Fisheries, 1998).

Catamaran, plank-built canoes and mechanised boats are commonly used for fishing. Trawl nets, gill nets, seine nets, hook and lines, etc., are employed as fishing gears. Tuticorin Port is the main fishing harbour of this district. Fish market is available in many fishing villages. Ice plant facilities are present only in Vembar and Thoothukkudi and for the rest of the villages the distance to the nearest ice plant ranges from 5 to 30 km. Primary and middle schools are located in selected coastal villages. Drinking water facilities, post office, nationalised banks, shops, communications facilities, etc., are also available but not in required numbers. This district is considered as an industrial district because it has several industries including Southern Petrochemical Industrial Corporation (SPIC), Tuticorin Alkali Chemicals (TAC), Tuticorin Thermal Power Station (TTPS), Sterlite Copper Industry, many salt-based industries and fish processing plants. Thoothukkudi is its district headquarters.

3.2.3. Tirunelveli district

There are about seven coastal fishing villages in this district. The total fisherfolk population was about 0.30 lakh. This district is bounded on north by Virudunagar and Thoothukkudi districts, west by Kerala State, south by Kanyakumari district and the eastern part is surrounded by Gulf of Mannar with a coastal length of 50 kilometres. There is no cyclone centre and only 3 guide lights are available in this district. (Department of Fisheries, 1998). The district has infrastructures facilities such as roads, electricity, post

office, banks, communication, fish market, drinking water, etc., which are inadequate. The Thamiraparani river is the main source of irrigation. Tirunelveli is the district headquarters.

3. 2. 4. Kanyakumari district

This district is located in the southern tip of the Peninsular India, covering an area of 1671 sq. km., and bordered by Tirunelveli district in the north and north-east, Kerala state in the north-west, Arabian Sea in the west and Indian Ocean in the south. The district is densely populated with a total population of 14.2 lakhs with 849 persons per sq. km. This district is divided into four taluks viz., Agastheeswaram, Thovalai, Kalkulam and Vilavancode. Except Thovalai, all others are coastal taluks. It stretches from the Arabian Sea to the Western Ghats upto an elevation of 600 meters. The average annual rainfall in the district is 1465 mm receives in 64 rainy days and is more or less continuous from April to December with a relative humidity of 60 -100 per cent.

The five important rivers in this district are Pazhayaru, Villiyaru, Thovalaiaru, Thamiraparani and Mullayaru. The irrigation projects in the district are Pechiparai, Perunchani, Kodayar and Chittar I and II. The major crops are rubber, coconut, tapioca, banana, rice, mango, cashew and other horticultural crops. The total coastal length of this district is about 68 kilometres. There are about 44 fishing villages in this district. The fisherfolk population was about 2.09 lakhs out of which 0.49 lakh was active fisherfolk. There is no cyclone centre and only 7 guide lights are available. (Department of Fisheries, 1998). All other facilities like bus, post office, banks, communication, fish market, drinking water facilities, etc., are available in the district.

3. 3. Selection of taluks, fishing villages and respondents

There are 12 coastal taluks and 169 fishing villages in these four selected districts. Two coastal taluks from each of the district were selected (except Tirunelveli district where only one coastal taluk is available) based on the maximum number of fisherwomen population. Two fishing villages were selected from each of the selected taluk based on the maximum number of fisherwomen population. Thus, a total of 14 fishing villages were selected. From these selected fishing villages, 320 fisherwomen were randomly selected proportionate to its size. The number of coastal taluks in each selected district, name of the villages and number of respondents selected are given in the Table 1. The districts and study areas are also depicted in Figure 1.

3. 4. Identification of variables

By perusing through the related literature and discussion with the social scientists of Tamil Nadu Veterinary and Animal Sciences University, Chennai and Tamil Nadu Agricultural University, Coimbatore and with the Fisheries Extension Personnel, several variables were identified. Keeping the objectives in view, the variables awareness, knowledge and the extent of participation were considered as dependent variables for the study, besides 16 independent variables were included in the study based on the opinion of the judges (Appendix -II, Annexure -1). Each independent variable was measured individually to know their influences on the dependent variables. The variables selected and their measurements are given in the Table 2.

Table 1. Detail of the districts, coastal taluks, villages and fisherwomen selected for the study

No.	Name of the districts selected	Coastal Taluks	No. of villages in each taluk	List of selected taluks	List of selected villages	Total No. of fisherwomen population	No. of respondents selected
1	Ramanathapuram	Thiruvadanai	17	Ramanathapuram	Mandapam	2911	26
		Ramanathapuram	43	-do-	Keezhakarai	2400	21
		Rameswaram	31	Muthukulathur	Chinnaervadi	2007	18
		Muthukulathur	8	-do-	Valinokkam	2100	19
			(99)				
2	Thoothukkudi	Ottapidaram	5	Thoothukkudi	Thirespuram	1120	10
		Thoothukkudi	3	-do-	Thoothukkudi	1000	9
		Srivaikundam	2	Tiruchendur	Amalinagar	1010	9
		Tiruchendur	9	-do-	Manapadu	890	8
			(19)				
3	Tirunelveli	Radhapuram	7	Radhapuram	Koothankuzhi	680	6
			(7)	-do-	Kooduthazhai	501	5
4	Kanyakumari	Agastheeswaram	15	Kalkulam	Colachel	7458	66
		Kalkulam	12	-do-	Kodimunai	4211	37
		Vilavancode	17	Vilavancode	Vallavilai	5361	48
			(44)	-do-	Neerodi	4298	38
						35947	**320**

(Figures in parenthesis indicates the total number of coastal villages in each district)

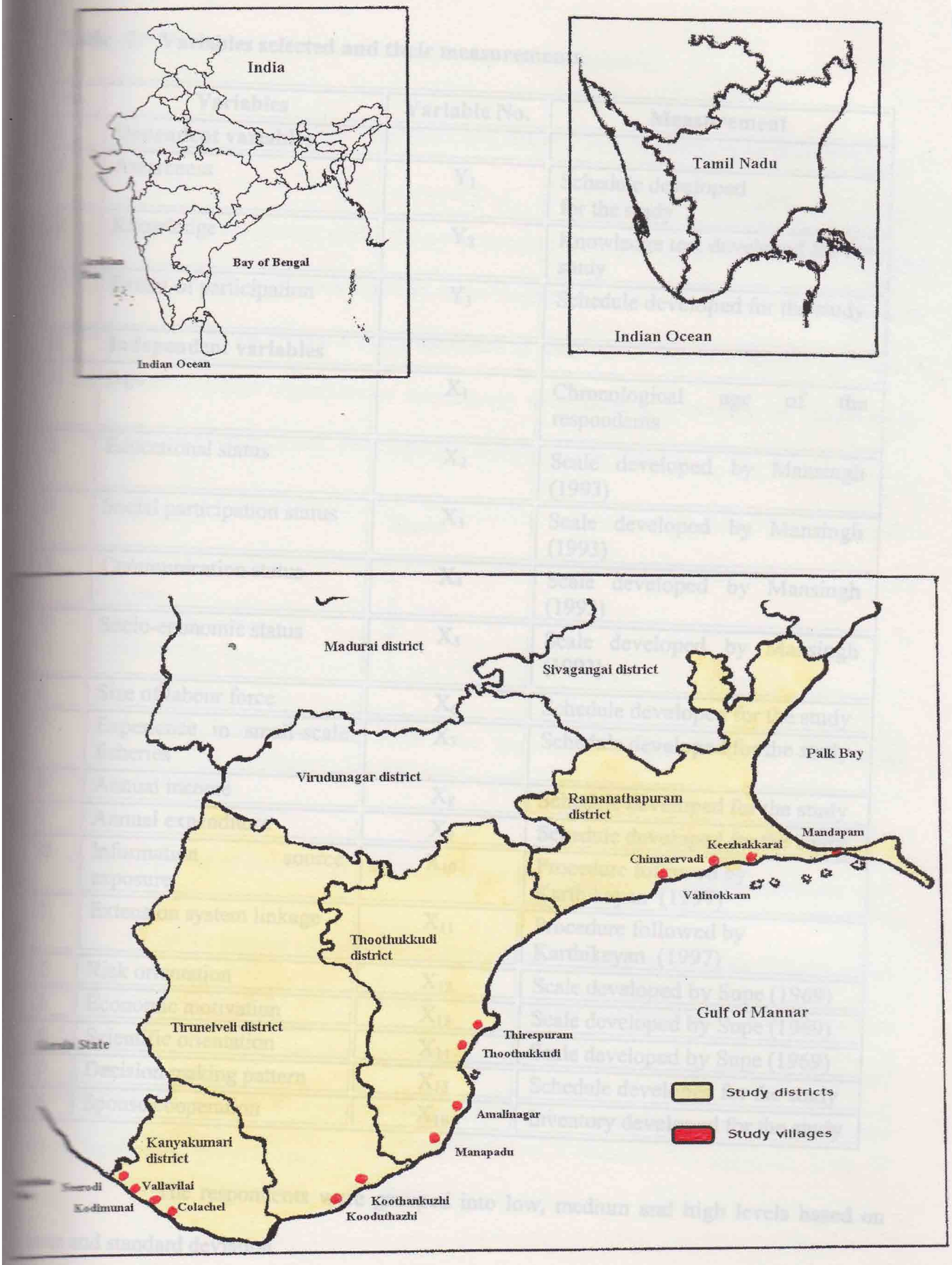


Figure 1. Map showing the study areas

Table 2. Variables selected and their measurements

No.	Variables	Variable No.	Measurement
I	**Dependent variables**		
1	Awareness	Y_1	Schedule developed for the study
2	Knowledge	Y_2	Knowledge test developed for the study
3	Extent of participation	Y_3	Schedule developed for the study
II	**Independent variables**		
1	Age	X_1	Chronological age of the respondents
2	Educational status	X_2	Scale developed by Mansingh (1993)
3	Social participation status	X_3	Scale developed by Mansingh (1993)
4	Communication status	X_4	Scale developed by Mansingh (1993)
5	Socio-economic status	X_5	Scale developed by Mansingh (1993)
6	Size of labour force	X_6	Schedule developed for the study
7	Experience in small-scale fisheries	X_7	Schedule developed for the study
8	Annual income	X_8	Schedule developed for the study
9	Annual expenditure	X_9	Schedule developed for the study
10	Information source exposure	X_{10}	Procedure followed by Karthikeyan (1997)
11	Extension system linkage	X_{11}	Procedure followed by Karthikeyan (1997)
12	Risk orientation	X_{12}	Scale developed by Supe (1969)
13	Economic motivation	X_{13}	Scale developed by Supe (1969)
14	Scientific orientation	X_{14}	Scale developed by Supe (1969)
15	Decision making pattern	X_{15}	Schedule developed for the study
16	Spouse cooperation	X_{16}	Inventory developed for the study

The respondents were grouped into low, medium and high levels based on mean and standard deviation.

Operationalisation and measurement of dependent variables

3. 5. Awareness of small-scale fisheries and the activities of fisheries development organisations

In the present study, the awareness has been operationalised as the respondent's ability to know the small-scale fisheries technologies and activities of fisheries development organisations. All the 34 and 7 items identified as small- scale fisheries and the activities of fisheries development organisations respectively were listed to ascertain the fisherwomen whether they are aware or not. The responses were scored as follows:

Response	Score
Well aware	4
Aware	3
Somewhat aware	2
Not aware	1

The sum of all the items score were added to get awareness score of the individual respondent.

3. 6. Development of knowledge test to measure the knowledge of the respondents

In the present study, knowledge has been operationalised as the fisherwomen's ability to have in mind, to be able to recall, or be acquainted with their theoretical or practical understanding of various small-scale fisheries and activities of fisheries development organisations. In order to measure the knowledge level, a knowledge test was developed following the steps given below.

3. 6. 1. Items collection

After the perusal of relevant literature and discussion with the scientist and officials working in the fisheries organisations, an exhaustive list consisting of 60 items seeking information on various activities of small-scale fisheries and fisheries development organisations was prepared.

3. 6. 2. Item analysis

To measure the knowledge level of fisherwomen in small-scale fisheries and the activities of fisheries development organisations a teacher made test was followed. For this, the collected exhaustive list were sent to 75 judges comprising of scientists and officials working in the fisheries organisations with a request to indicate the suitability of questions to be included in the interview schedule on five point continuum viz., most important, more important, important, less important and not important. The scores of 5,4,3,2 and 1 were assigned to most important, more important, important, less important and not important respectively

3. 6. 3. Final selection of items

Out of 75 judges, 55 judges sent their responses. The pooled score obtained for each of the questions on the five-point continuum was summed up to get a total score for each question. The questions were arranged in the descending order based on the total score. All those questions which were above the mean level were included in the schedule. Thus, 20 questions were qualified to be included in the interview schedule.

The selected 20 questions were dichotomised into correct and incorrect responses. The responses were collected and every correct answer was assigned with two score while incorrect answer was given one score. All such scores for 20 items were summed up to obtain the knowledge score of the individual respondents. The possible range of score in the study was from 20 to 40.

3.7. Extent of participation

Fisherwomen's participation in the small-scale fisheries and in the activities of the fisheries development organisations is defined as the degree to which the fisherwomen are involved in different small-scale fisheries and the activities of fisheries development organisations.

A total of 34 items on various small-scale fisheries activities and 7 activities in fisheries development organisations were identified on the basis of opinion of the fisheries scientists and officials working in the fisheries development organisation to find out the extent of participation (Appendix -II, Annexure -2).

The responses were collected on four point continuum viz., self-doing/participation, under supervision/guidance, collaboration with others and not participated in the activities and the responses were assigned with the scores of 4, 3, 2 and 1 respectively. The extent of participation of fisherwomen in each activity was computed with the corresponding score. Accordingly, the total scores obtained from all the activities constituted the total extent of participation.

3.8. Constraints in participation of small-scale fisheries activities

In this study, constraint means the impediment in the way of participation of fisherwomen in various aspects of small-scale fisheries. The constraints expressed by the fisherwomen were grouped and expressed in percentage.

3.9. Operationalisation and measurement of independent variables

The operational definitions of independent variables selected for the study and their measurement procedure followed are given below.

3.9.1. Age

The age of the fisherwomen was operationalised as the number of completed years of age at the time of enquiry and the chronological age was taken as a measure. The respondents were classified into three categories as given below.

Category	Years
Young	Upto 35
Middle	36 to 45
Old	Above 45

3.9.2. Socio-economic status (SES)

The socio-economic status (SES) was operationalised as the position of a fisherwoman and her family in respect of her social and economic condition, when compared with the prevailing average standards in the society. The scale developed by Mansingh (1993) was used to measure the SES of the respondents with slight modification to suit the present study.

The scale consists of eight components viz., educational status, communication status, family status, farm power status, farm status, material status, occupational status and social participation status. Since the fisherwomen families do not have any agricultural farms, the farm status was not taken into consideration.

Thus, this scale consists of only seven components. The farm power status was considered as fisheries power status. The socio-economic status of the respondent was computed on the basis of the scores obtained for each of the components. The sum of all such scores of seven components is the total score for SES of each respondent. The operationalisation and measurement of these seven components of the scale are as follows:

3.9.2.1. Educational status

It refers to the educational status level of the respondent. The scoring procedure used was:

Educational status	Score
Illiterate	1
Functionally literate	2
Primary education	3
Middle education	4
Secondary education	5
Collegiate education	6

3.9.2.2. Family status

Family status was operationalised as the status in which position the individual fisherwoman is living in the society. This variable was quantified using the following scoring procedure:

Item	Score
a) Nuclear family / Joint family	1/2
b) Low caste (SC/ST) high caste (MBC/BC/FC)	1/2
c) Mud walled and thatched house	1
Mud walled and tiled house	2
Brick walled and tiled house	3
Brick walled and concrete roof	4
d) Mud floor / cement floor / mosaic floor	1/2/3
e) Unelectrified /electrified house	1/2

3. 9. 2. 3. Occupational status

It refers to the occupation status of the respondent. The following scoring procedure was followed:

Item	Score
Wage earners (casual labourers in fisheries and /or in other enterprises)	1
Fishing + wage earners	2
Fishing (small- scale fisheries activities)	3
Fisheries business (self- employed)	4
Services (employed as salaried persons in government or private sectors)	5
Fishing + business	6
Fishing and services	7

3. 9. 2. 4. Social participation status

This refers to the degree of participation / involvement of the respondent in formal organisations either as member or office bearers. The scoring procedure adopted for this variable was as follows.

Item	Score
No membership	1
Member in one organisation	2
Membership in more than one organisation	3
Office bearer in one organisation	4
Office bearer in more than one organisation	5

3.9.2.5. Communication status

This refers to the respondent's subscription to newspapers, weekly or monthly magazines and /or fisheries magazines. The scoring pattern used for this variable was as follows:

Item	Score
No subscription	1
Subscription to newspapers	2
Subscription to weekly / monthly magazines	3
Subscription to fisheries magazines	4

3.9.2.6. Fisheries power status

This refers to the fisheries equipments and machineries owned and used by the respondent's family and was measured by assigning following scores:

Item	Score
Craft	
Catamaran	1
Motorised catamaran	2
Vallam	3
Motorised vallam	4
Mechanised boat	5
Trawler	6

Gear

Palmyra basket	1
Bamboo basket	2
Chala vala / ayla vala (net)	3
Cola vala	4
Drap net	5
Shore seine	6
Shrimp net	7
Trawl net	8

3.9.2.7. Material status

This refers to the possession of non-fisheries goods or household articles owned and used by the respondents. The measurement procedure adopted was as follows:

Item	Score
Wall clock	1
Battery operated transistor	2
Radio	3
Tape recorder	4
Television	5
Two wheelers (scooter, motorcycle moped, etc)	6
VCP / VCR/VCD	7
Telephone	8
Automobiles (car, jeep, van, etc.)	9

3.9.3. Size of labour force

According to Leland (1980) the labour force includes all those 16 years old or over, possess a job, or self employed or looking for a job. Edwin (1983) defined labour force as those who productively employed plus those who, if they are not employed, are actively seeking employment. For the present study the actual earning members were considered in absolute terms without assigning any score.

3.9.4. Experience in small-scale fisheries

The number of years of experience an individual possessed in small-scale fisheries was considered as experience in small-scale fisheries. The completed years of experience of the respondent was considered for the purpose of analysis.

3.9.5. Annual income

Annual income was operationalised as the total income in rupees obtained by a respondent from different sources like, fishing, animal husbandry enterprises, wages, salary, petty shops and other sources for one year. For analysis purpose for every thousand rupees was given one score.

3.9.6. Annual expenditure

This refers to the amount of money spent for maintenance of the family for one year. For the purpose of analysis, every thousand rupees was given one score.

3.9.7. Information source exposure

It was operationalised as the extent to which an individual was exposed to messages related to fisheries and allied areas through various information sources. The scoring was done based on the frequency of exposure to different sources as followed by Karthikeyan (1997) with slight modification in sources, frequency of exposure and score to suit the study.

Sources	Frequency of exposure	Score
a) Seminar	number attended	1 for each
b) Training programme	number attended	1 for each

c) Scientific books literature	owned /borrowed number owned/ borrowed	2/1 1 for each
d) Newspaper	subscribed / borrowed regular/ occasional / never	2/1 3/2/1
e) Fisheries magazines	subscribed / borrowed regular/ occasional / never	2/1 3/2/1
f) Radio programme	owned / dependent on other regular/ occasional / never	2/1 3/2/1
g) Television programme	owned / dependent on other regular/ occasional / never	2/1 3/2/1

Sum of the scores of these items was taken as a measure of the information source exposure of a respondent.

3.9.8. Extension system linkage

It was operationalised as the fisherwomen linkage with different extension systems through personal contacts and participation in various extension activities for acquiring information on small-scale fisheries. The quantification of this variable was done based on frequency of contacts with fisheries scientist and extension personnel of development departments and regularity of participation on various extension methods. The scoring procedure used by Karthikeyan (1997) was followed to measure the extension system linkage.

I. Frequency of extension personnel contact

Frequency of contact	Score
Weekly	6
Fortnightly	5
Monthly	4
Occasionally	3
Seldom	2
Never	1

II. Participation in extension methods

Participation	Score
Regularly	3
Occasionally	2
Never	1

The scores on these two dimensions were summed up to obtain the total extension system linkage score of the respondent.

3.9.9. Risk orientation

It was operationalised as the degree to which the fisherwomen were oriented towards risk and uncertainty while participating in various activities. Risk orientation scale developed by Supe (1969) was used since it is considered as a best one. In this study the scale was used with slight modification in the statements. The scale consists of six statements, wherein items one and five were negative and the rest were positive statements. The scoring was done as given below.

Statements	Response				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Positive	7	5	4	3	1
Negative	1	3	4	5	7

The scores obtained for each statement were summed up to get individual respondent's risk orientation score. The possible range of score in this scale was from 6 to 42. The maximum score reveals high risk orientation, while the minimum score indicates low risk orientation of the respondent

3.9.10. Economic motivation

Economic motivation was operationalised as the extent to which fisherwoman was oriented towards achievement of the maximum economic ends such as maximisation of profits.

It was measured with the scale developed by Supe (1969) since it is considered as a best one and the scale was used with slight modification in the statements to suit the present study. There were six items in the scale of which four were positive and the remaining two were negative statements. The scoring procedure adopted was given below.

Statements	Response				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Positive	7	5	4	3	1
Negative	1	3	4	5	7

The score obtained by the individual for each item were summed up to get final economic motivation score. The maximum possible score for a respondent was 42 and the minimum possible score was 6.

3.9.11. Scientific orientation

Scientific orientation was operationalised as the degree to which fisherwomen was oriented to the use of scientific methods and technologies in small-scale fisheries and allied activities. Scientific orientation scale developed by Supe (1969) was used since it is considered as a best one. In this study the scale was used with slight modification in the

statements. The scale consisted of six statements of which the second one was negative and the rest were positive. The scoring procedure adopted was as follows:

Statements	Response				
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Positive	7	5	4	3	1
Negative	1	3	4	5	7

The score of each statement was added to get final score of scientific orientation for each individual. The maximum and minimum score an individual can get on this was 42 and 6 respectively.

3. 9. 12. Decision making pattern

According to Byerlee *et al.* (1982) it is farmers, not judges, that make the decisions and, therefore, special attention will have to be given to both socio-economic environment as well as to the decision making process taking place within a household. It was operationalised as the nature of decision making either individually, jointly or collectively that the respondent has to resort to while performing different fisheries activities.

Decision making areas in small-scale fisheries were identified and included in the inventory. It consists of six decision-making areas which were fitted on a four-point continuum of decision-making pattern viz., head of the family/respondent, husband alone, joint and collective decisions with the score of 4, 3, 2 and 1 respectively for analysis.

Thus, the maximum possible score was 24 and minimum score was 6. Higher score indicates more individual decisions while lesser score implies more collective decisions.

3.9.13. Procedure followed to develop inventory of spouse cooperation

The items reflecting the areas of spouse cooperation were collected based on the literature available in fisheries and discussion with the experts in the field of fisheries development. The list of areas thus collected were given to judges consisting of experts in the field of fisheries. They were requested to scrutinise the inventory of these areas by noting along any of the points namely, most relevant, more relevant, relevant, less relevant and not relevant and the scores assigned were 5, 4, 3, 2 and 1 respectively (Appendix -II, Annexure - 3).

The areas were arranged in descending order based on total score. Mean and standard deviation of the score obtained were worked out and areas with score above the mean plus standard deviation were selected. Thus, ten areas of spouse cooperation were selected for inclusion in the inventory and the following scoring procedure was used to measure the variable:

Items	Score
Regularly	5
Occasionally	4
Whenever asked	3
Insisted by family members	2
Never	1

3.10. Assessment of training preference (needs)

Training preference was operationally defined as the expressed level of training as preferred by respondents in each of the training areas referred. Training preference of fisherwomen was assessed in specific items under each of the subject matter areas.

3.10.1. Ranking System

To measure the training preference in the major subject matter areas, ranking system was used. The respondents were asked to check each major subject matter area as well as specific item under each major area on a three-point continuum viz. much needed, somewhat needed and not needed with scores of 3, 2 and 1 respectively. Then these scores were added together and divided by the number of respondents, which gave the mean score for each major subject matter area and specific item. The mean score thus obtained separately for all major subject matter areas and specific items were used as basis for ranking them in the order of their preference.

3.10.2. Major area. This refers to the subjects which are broad in nature. The major areas include the following items;

1. Preparation of dry fish
2. Preparation of fish oil
3. Preparation of fish pickle
4. Preparation of prawn pickle
5. Preparation of fish meal
6. Preparation of fish ensilage
7. Preparation of fish soup powder
8. Preparation of shark-fin ray
9. Preparation of masmin
10. Preparation of wafers
11. Preparation of fish murukku
12. Preparation of agar agar
13. Preparation of Chitosan

14. Preparation of marine shell crafts
15. Seaweed culture
16. Mussel culture
17. Hygienic handling of fish and fishery products

3.10.3. Sub - areas. These are the specified areas under each of the major area consisting of two to four items.

3.10.4. Types of training

3.10.4.1. Institutional training (on-campus training)

Training given to fisherwomen by subject matter specialists in the institution itself such as Fisherwomen Training Centre, Fisheries College and Research Institute, State Department of Fisheries, Voluntary Organisations, etc.

3.10.4.2. Peripatetic training (off-campus training)

A team of subject matter specialists of Fisherwomen Training Centre, Fisheries College and Research Institute, Department of Fisheries moves to the field to provide training for fisherwomen in the village itself.

3.10.4.3. Farm School on AIR

It refers to series of lessons on selected topics of fisherwomen's interests given as a talk by the staff of the Fisheries College and Research Institute, Tamil Nadu Veterinary and Animal Sciences University, Thoothukkudi through All India Radio.

The respondents were asked to indicate their preference for any of these three types of training. The percentage of respondents for each type of training was worked out to get the most preferential types of training.

3.10. 5. Methods of training

3. 10. 5. 1. Single method

In this study four training methods viz., lecture, demonstration, group discussion and field trip and tours were considered. Percentage was worked out to get their individual ranking position.

3. 10. 5. 2. Combination of methods

Three types of combination of training methods, viz., lecture cum demonstration, discussion cum demonstration and lecture cum discussion cum field trips were referred for the present study. Percentage was worked out to get their individual ranking position.

3. 10. 6. Seasons of training

This refers to the seasons in which fisherwomen preferred to undergo training. Percentage was worked out to get the rank position.

3. 10. 7. Duration of training

This pertains to number of days indicated by the fisherwomen for undergoing training programme. Percentage was worked out to get the rank position.

3. 10. 8. Training group

This refers to the total number of fisherwomen in each training programme. Percentage was worked out to get the rank position.

3.11. Development of interview schedule

Taking into consideration of the scope and objectives of the study, a draft interview schedule was prepared after perusal of available literature and through consultation with experts in the field of extension education and other related fields. After incorporating the suggestions of the experts a well-structured interview schedule was finalised. Thus, the interview schedule was constructed by including all the items relating to independent variables and dependent variables. All the relevant scales, schedules, items and inventory developed for the study for measuring the variables were included in the interview schedule. This was pre-tested with non-sample area to probe the relevancy of the schedule to suite the study. Based on the results of pre-testing, suitable modifications were made and a final interview schedule was prepared (Appendix- I).

3.12. Collection of data

The data were collected from respondents who were included in the sample. A preliminary visit was made to each selected study area and discussed with the President of Fishermen and Fisherwomen Cooperative Societies, village leaders, Parish Priests and extension personnel of fisheries department. The villages were visited along with local village leader, youth, etc., to collect data from the fisherwomen. During the visit respondents were informed about the purpose of the study. The data were collected from the fisherwomen by personal interview conducted under an informal atmosphere. Each question was explained to them and equal emphasis was given in explaining the questions to all the respondents interviewed. Information was also collected from the Fisheries Development Organisations and Non-governmental organisations in the study areas wherever required.

3.13. Statistical tools used

The data were scored as per the predetermined set of standards and then tabulated. Keeping in view of the objectives of the study, data were subjected to different statistical tests. The analyses include mean, standard deviation for classification of respondents into low, medium and high categories and percentage was used for comparison of different groups and frequencies. The other statistical tests like ANOVA, correlation coefficient, multiple regression and path analysis were also used for analysing the data to know the relationship and influence of independent variables on dependent variables. The computer software packages Microsoft Excel, CoRes and SYSTAT (SPSS Inc.) were used for statistical analysis.

3.14. Conceptual framework of the study

The conceptual framework of the study serves as a guidance to identify the independent variables for the present study. Some of the variables were also identified after discussion with fisheries officials and extension staff of the Tamil Nadu Veterinary and Animal Sciences University, Tamil Nadu Agricultural University. Based on this, a conceptual model has been developed and represented in Figure 2.

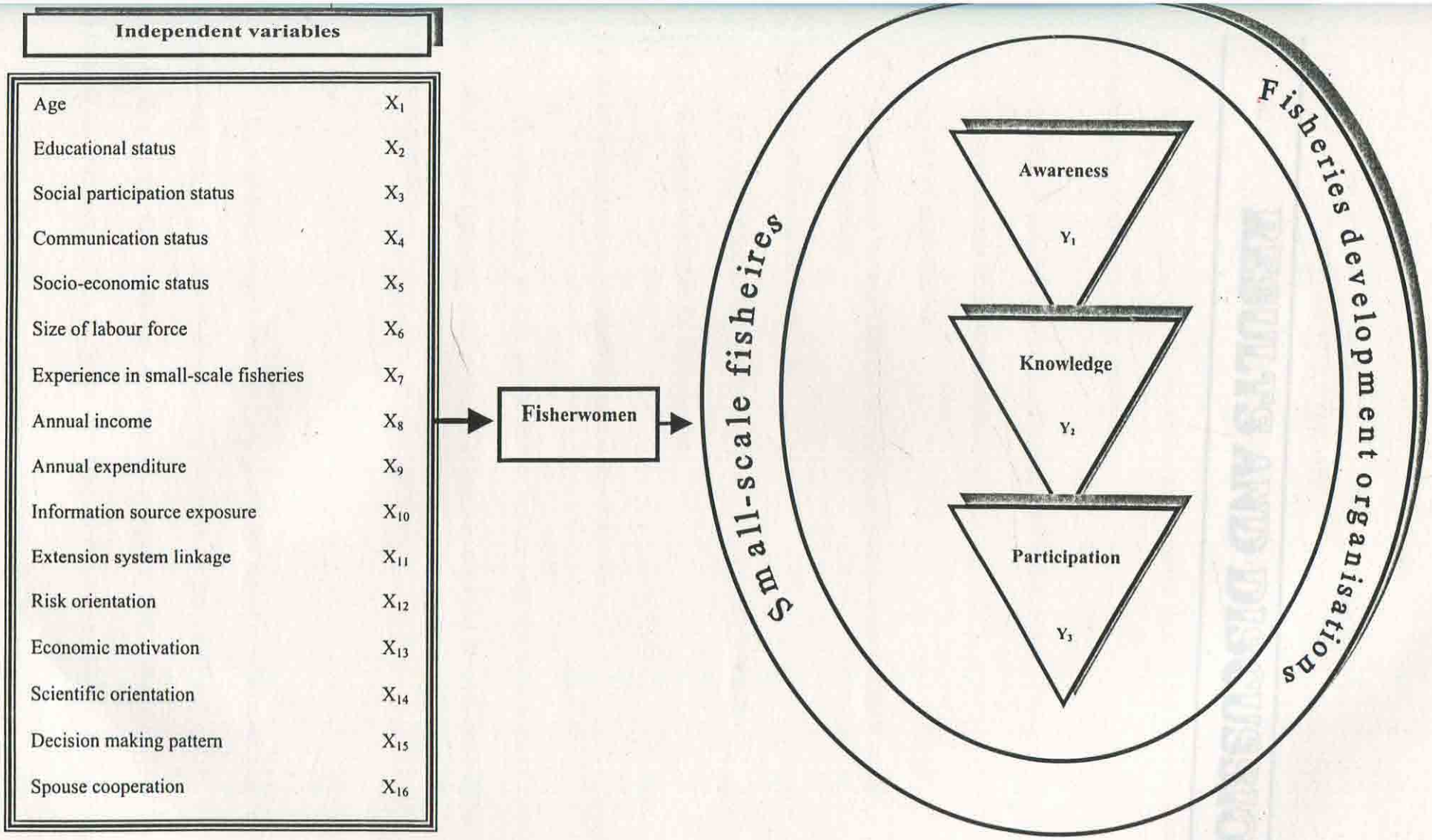


Figure 2. Conceptual model of the study

RESULTS AND DISCUSSION

CHAPTER - IV

RESULTS AND DISCUSSION

The results, discussion and inferences drawn in the light of the objectives set forth are presented under the followings sections:

4. 1. Profile of fisherwomen engaged in small-scale fisheries

4. 2. Awareness and knowledge levels

4. 3. Extent of participation

4. 4. Relationship between the characteristics of respondents and their extent of participation

4. 5. Constraints in participation

4. 6. Training strategies for women engaged in small-scale fisheries

4. 7. Prospects available for fisherwomen

4.1. Profile of fisherwomen engaged in small-scale fisheries

To obtain clear picture on the factors influencing the behaviour of women engaged in small -scale fisheries, data on profile of women engaged in small-scale fisheries was of prime importance.

4.1.1. Age

It could be observed from the Table 3 that the majority of women were under young age group (53.31 per cent) followed by middle (28.13 per cent) and old (21.56 per cent) age. This is in line with the findings of Ahilan (1988), Sharma (1998) and Soundararjan and Renuka (1998). It shows that most of the young women in the village

were actively engaged in small-scale fisheries when compared to middle and old aged women.

Table 3. **Age level of respondents**

No.	Categories	Number	Percentage
1	Young	161	50.31
2	Middle	90	28.13
3	Old	69	21.56
		320	**100.00**

4.1.2. Educational status

Fisherwomen under this study were categorised into illiterate, functionally literate, primary, middle, secondary school and collegiate level of education (Table 4).

Table 4. **Educational status of fisherwomen**

No.	Educational level	Number	Percentage
1	Illiterate	99	30.96
2	Functionally literate	97	31.31
3	Primary school	51	15.93
4	Middle school	43	13.43
5	Secondary school	25	7.81
6	Collegiate	5	1.56
		320	**100.00**

It is seen from this Table that higher the educational level, lower the distribution of respondents. Majority of the fisherwomen were illiterate (30.69 per cent) and functionally literate (30.31 per cent). The percentage of the respondents who had primary level of education was only 15.93 per cent. About 13.43, 7.81 and 1.56 per cent of respondents had middle, secondary school and collegiate level of education respectively.

It indicates that by and large the educational level of the fisherwomen was low. The findings of Karunaanbarasan (1985), Sehara *et al.* (1986), Venkataramanujam *et al.* (1987) and Sujathkumar (2000) also support this result.

4.1.3. Social participation status

It could be observed from the Table 5 that many of them had medium (34.69 per cent) and high (34.06 per cent) levels of social participation followed by low level (31.25 per cent) of participation. This reflects that there was no much difference in their social participation. A large group of respondents had medium level of communication status (71.88 per cent) followed by high (15.62 per cent) and low (12.50 per cent) levels communication status.

Table 5. Social participation status of respondents

No.	Social participation status	No.	Percentage	Mean	Standard Deviation
1	Low (upto 1.05)	100	31.25		
2	Medium (1.06 - 3.62)	111	34.69	2.34	1.29
3	High (above 3.62)	109	34.06		
		320	**100.00**		

4.1.4. Communication status

The Table 6 reveals that the communication status of fisherwomen was average. The reason might be that most of the fisherwomen do not have the access to many communication facilities. The respondents had utilised the media like newspapers, magazines, publications, television and radio programmes. However, the use of such facilities was mostly for entertainment rather than fisheries activities.

Table 6. **Communication status of fisherwomen**

No.	Communication status	No.	Percentage	Mean	Standard Deviation
1	Low (upto 1.03)	40	12.50		
2	Medium (1.04 - 3.62)	230	71.88	2.33	1.28
3	High (above 3.62)	50	15.62		
		320	**100.00**		

4.1.5. Socio-economic status

About 53.13 per cent of the women possessed medium level of socio-economic status followed by low (28.12 per cent) and high (18.75 per cent) levels of socio-economic status (Table 7). Generally, the number of small-scale fisherfolk is much larger than large-scale fisherfolk. The per capita income of the later group is much higher then the former in terms of both quantity and value. Since the per capita income was very low, most of the fisherwomen fall under low and medium levels of socio-economic status.

Table 7. **Socio-economic status of fisherwomen**

No.	Socio-economic status	No.	Percentage	Mean	Standard Deviation
1	Low (upto 26.22)	90	28.12		
2	Medium (26.23 - 46.22)	170	53.13	36.23	10.00
3	High (above 46.22)	60	18.75		
		320	**100.00**		

4.1.6. Size of labour force

The Table 8 indicates only very little difference in the size of labour force of the respondent's family. A study conducted by Ahilan *et al.* (1996) reported that although many of the fisherwomen aware of various types of family planning programme, most of

them did not follow any of these measures. When the size of the family increases, the fisherwomen have to spend more money for expenditure which in turn affects the saving.

Table 8. Size of labour force of respondents

No.	Size of labour force	Number	Percentage
1	Upto 5 numbers	161	50.31
2	Above 5 numbers	159	49.69
		320	**100.00**

The findings of Tempelman (1987), Srinath (1988), Sathiadhas *et al.* (1994) Sheela (1995) and Roy and Dorairaj (1998) also support this result.

4. 1. 7. Experience in small-scale fisheries

Majority of the respondents (57.50 per cent) had 10-15 years of experience in small-scale fisheries while almost equal number of respondents had either low or high experience in small-scale fisheries (Table 9). Majority of the fisherwomen entering into fisheries related activities in their early ages and this might be the reason for more than 10 years of experience in small-scale fisheries by about 79.06 per cent of the respondents.

Table 9. Experience in small-scale fisheries

No.	Categories	Number	Percentage
1	Upto 10 years	67	20.94
2	11 - 15 years	184	57.50
3	Above 15 years	69	21.56
		320	**100.00**

The above finding is in accordance with the findings of Sujathkumar (2000)

4.1.8. Annual income

In every economic behaviour, the level of income constitutes an important indicator of standard of living of the community. The source of income varies from person to person. The fisherwomen derive income from various sources like fishing, animal husbandry, wages, services, business, etc. The analysis of annual income of the fisherwomen could be made through the Table 10.

Table 10. Annual income of fisherwomen

No.	Sources of income	Average annual income (Rs.)	Percentage
1	Fishing	13,709	71.58
2	Animal husbandry	909	4.75
3	Wages	1,256	6.56
4	Service	899	4.69
5	Business	1,327	6.93
6	Others	1,051	5.49
		19,151	**100.00**

The average annual income of the fisherwomen household families was worked out to Rs. 19,151/- and the income per day for each household was Rs. 52/- only. The average monthly income for each fisherwomen family comes to Rs. 1,560/-. This finding differs from the findings of Sehara *et al.* (1986), Tempelman (1987) and Venkataramanujam *et al.* (1987). However, this is in line with the findings of Soundararjan and Renuka (1998) and Sujathkumar (2000).

It could be seen from the Table 10 that the average annual income from fishing related activities constituted 71.58 per cent of the total annual income. Whereas the annual income from non- fishing sources constituted only 28.42 per cent only, i.e., almost

one-third of the annual income comes from non-fishing sources. It is evident that the major source of income was small-scale fisheries and if the fisherwomen are aware of the developments in small-scale fisheries; it could further increase their annual income through fisheries related activities.

4.1.9. Annual expenditure

It could be seen from the Table 11 that the expenditure on fisheries related activities and family maintenance were Rs. 4,112/- and 5,997/- which constitute 25.35 per cent and 36.98 per cent of total expenditure respectively. High expenditure on food consumption may lead to meagre savings. The expenditure on other items like education, dress, recreation, medicine and others were Rs. 2,132, Rs. 1,002, Rs. 996, Rs. 1,112 and Rs. 869 which constitute 13.14 per cent, 6.18 per cent, 6.14 per cent, 6.85 per cent and 5.36 per cent of expenditure respectively. The above finding is in line with the findings of Mammo (1987) and Sujathkumar (2000).

Table 11. Annual Expenditure level

No.	Items	Average annual expenditure (Rs.)	Percentage
1	Fishing related activities	4,112	25.35
2	Family maintenance (food)	5,997	36.98
3	Education	2,132	13.14
4	Medicine (health)	1,112	6.85
5	Dress	1,002	6.18
6	Recreation	996	6.14
7	Others	869	5.36
		16,220	**100.00**

It is obvious from the Tables 10 and 11 that the average savings of the fisherwomen families was only Rs. 2,931 per annum (Rs. 19,151 - Rs. 16,220). However, the actual saving rate may vary, depending on the size and per capita income of the family. This low saving is due to low per capita income, indebtedness, ignorance of importance of saving, etc.

4.1.10. Information source exposure

With respect to information source exposure (Table 12), radio programmes on fisheries were listened about 63.75 per cent of the fisherwomen followed by training programmes (29.06 per cent) and television programmes (21.56 per cent). Seminar, scientific books / literature, newspapers and fisheries magazines were used by only very little portion of the respondents. It could be concluded that radio, training and television programmes were mostly utilised by the fisherwomen.

Table 12. Information source exposure level of fisherwomen

No.	Sources	Frequency of exposure	Percentage
1	Seminar	18	5.63
2	Training programme	93	29.06
3	Scientific books / literature	13	4.06
4	Newspaper	29	9.06
5	Fisheries magazines	2	0.63
6	Radio programmes	204	63.75
7	Television programmes	69	21.56

4.1.11. Extension system linkage

The extent of extension system linkage was ascertained by interviewing the fisherwomen. It could be observed from Table 13 that about 46.88 per cent of the respondent had low level of extension system linkage while 31.26 per cent of the respondents had medium level of extension system linkage followed by high (21.86 per cent) level of extension system linkage.

Though the Department of Fisheries, Universities and Colleges, Department of Forestry, Fisherwomen and Fishermen Cooperative Societies, District Rural Development Agencies (DRDAs) and Non- Governmental Organisations are functioning in these districts their extension activities are limited, due to various administrative reasons. The contacts of fisherwomen with the Extension Officers of these agencies were comparatively low when compared to agriculture extension agencies and could be rectified by employing more filed level functionaries and fishery assistants at the village level. The above finding is in accordance with the findings of Ahilan (1988), Sujathkumar (1988 & 2000).

Table. 13. Extension system linkage of respondents

No.	Extension system linkage	No.	Percentage	Mean	Standard Deviation
1	Low (upto 22.90)	150	46.88		
2	Medium (22.91 - 39.30)	100	31.26	31.11	8.20
3	High (above 39.30)	70	21.86		
		320	**100.00**		

4.1.12. Risk orientation

People who are oriented towards risk tend to be successful in their enterprises compared to those whose outlook is conservatism. The risk orientation of respondents is presented in the Table 14.

Table 14. Risk orientation of respondents

No.	Risk orientation	No.	Percentage	Mean	Standard Deviation
1	Low (upto 22.93)	81	25.31		
2	Medium (22.94 - 32.88)	170	53.13	27.91	4.98
3	High (above 32.88)	69	21.56		
		320	**100.00**		

It could be observed that about 53.13 per cent of them had medium level of risk orientation followed by low (25.31 per cent) and high (21.56 per cent) levels of risk orientation. This indicates that fisherwomen are almost risk oriented which is necessary for their profession.

4.1.13. Economic motivation

About 59.06 per cent of the women had medium level of economic motivation followed by high (27.19 per cent) and low (13.75 per cent) levels of economic motivation (Table 15).

Table 15. Economic motivation of fisherwomen

No.	Economic motivation	No.	Percentage	Mean	Standard Deviation
1	Low (upto 23.16)	44	13.75		
2	Medium (23.17 - 31.71)	189	59.06	27.44	4.28
3	High (above 31.71)	87	27.19		
		320	**100.00**		

It indicates that they are almost oriented towards the achievement of maximum economic ends from the small-scale fisheries.

4.1.14. Scientific orientation

It could be seen from the Table 16 that about 53.13 per cent of the respondents had medium level of scientific orientation followed by high (30.93 per cent) and low (15.94 per cent) levels of scientific orientation. It could be concluded that the fisherwomen are oriented towards the use of scientific methods in small-scale fisheries and its allied activities.

Table 16. Scientific orientation of fisherwomen

No.	Scientific orientation	No.	Percentage	Mean	Standard Deviation
1	Low (upto 24.26)	51	15.94		
2	Medium (24.27 - 32.87)	170	53.13	28.57	4.31
3	High (above 32.87)	99	30.93		
		320	**100.00**		

4.1.15. Decision making pattern

Decision-making was considered as an important activity on the part of head of the family, headed either by male or female. The results emerged from this study are presented in the Table 17. It reveals that nearly one-fifth of the respondents had made joint decisions in the borrowing /lending money. About 12.81 per cent of respondents made decision alone in fish marketing. Decision on transportation of fish to the nearby or other markets was made by husbands (13.75 per cent) while beachside fishing / sale and fish cleaning in the market were decided by 12.19 and 12.81 per cent of the respondents

respectively. In the areas of purchase of fishing assets for fisheries activities about 30.31 per cent of them had made collective decisions.

Table 17. Decision making pattern

No	Activities	Decision making pattern (No.)				Percent age
		Respond-ent alone	Husband alone	Joint	Collect -ive	
1	Purchase of fishing assets	--	--	--	97	30.31
2	Fish marketing	41	--	--	--	12.81
3	Fish transportation	--	44	--	--	13.75
4	Beach side fishing / sale	39	--	--	--	12.19
5	Fish cleaning in the market	41	--	--	--	12.81
6	Borrowing / lending money	--	--	58	--	18.13
	Mean	**37.81**	**13.75**	**18.13**	**30.31**	**100.00**

It could be concluded that among the six activities identified about 37.81 per cent of the respondents had made individual decisions in three activities viz., fish marketing, beach side fishing/sale and fish cleaning in the market. This finding is supported by the findings of Sujathkumar (2000) who concluded that the fisherwomen were actively participated in decision making on fish marketing, money lending and borrowing, net purchasing and auctioning. Further, Daniel (1986) reported that the fisherwomen dominated in taking decision on almost all household activities.

4.1.16. Spouse cooperation

The Table 18 reveals that in getting financial assistance from the nationalised banks, cooperative societies, non-governmental organisations, private money lenders and

friends and relatives, about 55.62 per cent of the fisherwomen had received cooperation regularly from their spouse.

In preparing fishery products like fish / prawn pickles, masmin / fish wafers, fish oil / fish cutlet and preparing dried and salted fish, about 31.56 per cent of the fisherwomen had received cooperation regularly. About 24.06 per cent of them received cooperation occasionally and about 21.56 per cent of them did not receive any cooperation at all.

About 38.75 per cent of the respondents received cooperation from their spouse regarding help in making of hand fish net, fish baskets, ropes for fishing nets, marine shell crafts and repairing of fishing nets. About 20.62 per cent of the respondents had received cooperation only occasionally. Only 13.44 per cent of them received cooperation from their spouse whenever asked by them. About 12.19 per cent received cooperation from their spouse because of pressure from the family members and about 15.00 per cent of them had received no cooperation from their spouse.

It could also seen from the Table 18 that about 30.93 per cent of the fisherwomen received cooperation regularly from their spouse regarding help in the advertisement of fishery products in local newspapers, through folders/leaflets, radio, supermarkets and friends and relatives. About 23.44, 15.94, 14.69 and 15.00 per cent of fisherwomen had received cooperation occasionally, whenever asked, insisted by family members and never respectively.

Table 18. Spouse cooperation

No.	Areas of cooperation	Frequency of cooperation										Total	
		Regularly		Occasionally		Whenever asked		Insisted by family members		Never			
		No	%	No	%	No	%	No	%	No	%	No	%
1	In getting financial assistance	178	55.62	59	18.44	37	11.56	40	12.50	6	1.88	320	100
2	In preparing fishery products	101	31.56	77	24.06	42	13.13	31	9.69	69	21.56	320	100
3	Help in making / repairing nets	124	38.75	66	20.62	43	13.44	39	12.19	48	15.00	320	100
4	Help in advertise fishery products	99	30.93	75	23.44	51	15.94	47	14.69	48	15.00	320	100
5	Transportation of catches	209	65.31	59	18.43	18	5.63	8	2.50	26	8.13	320	100
6	Cooperate in fishing	187	58.43	67	20.94	51	15.94	7	2.19	8	2.50	320	100
7	In marketing	253	79.06	42	13.13	12	3.75	13	4.06	0	0	320	100
8	Help in participating various programmes	143	44.68	67	20.94	55	17.19	21	6.56	34	10.63	320	100
9	Moral support	277	86.56	32	10.00	11	3.44	0	0	0	0	320	100
10	Decision making	269	84.06	29	9.06	16	5.00	6	1.88	0	0	320	100
	Mean		**57.50**		**17.91**		**10.50**		**6.62**		**7.47**	**320**	**100**

In transportation of fish catches through automobiles, bicycles, as head load, to local markets and other village/town markets about 65.31 per cent of the fisherwomen had received cooperation regularly from their spouse and about 18.43 per cent of them had received cooperation occasionally.

About 58.43 per cent of them had regular cooperation from their spouse with regard to nearshore fishing, beach side fishing, hand picking, hand netting and chank collection and selling. About 20.94, 15.94, 2.19 and 2.50 per cent of them had received cooperation occasionally, whenever asked, insisted by family members and never respectively.

In marketing of fish catches on beach side, local markets, through auction, cooperative societies and private money lenders, about 79.06 per cent of them had received cooperation regularly from their spouse.

With regard to help in participating various programmes like fisheries campaigns, off-campus and on-campus training programmes, seminars and field visits / tours, about 44.68, 20.94, 17.19, 6.56 and 10.63 per cent of them had received cooperation regularly, occasionally, whenever asked, insisted by family members and never respectively.

In providing moral support, about 86.56 per cent of the fisherwomen had received cooperation regularly from their spouse and only about 10.00 and 3.44 per cent of them received cooperation occasionally and whenever asked respectively.

About 84.06 per cent of them had received cooperation from their spouse regularly regarding decision making on earning additional income, daily household expenditure, children education, savings and borrowing money.

In total, about 57.50, 17.91, 10.50, 6.62 and 7.47 per cent of the fisherwomen received cooperation from their spouse regularly, occasionally, whenever asked, insisted by family members and never respectively.

It reveals that the fisherwomen in one-way or other getting cooperation from their spouse on various activities of fisheries. The reason might be that cooperation from spouse would enhance family income and thereby the socio-economic status of their family could be improved.

4.2. Awareness and knowledge levels

4.2.1. Awareness of the respondents in small-scale fisheries activities

The awareness levels of fisherwomen on small-scale fisheries activities were measured by using the awareness test, which was developed for the study.

It is evident from Table 19 that the women had well aware of collection of prawn seeds (56.25 per cent) followed by aware (25.00 per cent), somewhat aware (15.31 per cent) and not aware (3.44 per cent). In collection of sea shells, about 66.25 per cent of them were well aware of this activity followed by aware level (21.88 per cent).

In sun drying, salting of fish, auctioning, lime shell collection, beach side sale, net mending and repairing and icing of fish, 100 per cent of the fisherwomen had well aware of these activities. In seaweed collection and seaweed culture about 76.56 and 76.87 per cent of the fisherwomen not aware of these activities respectively.

As far as marketing of fish and fishery products is concerned, about 87.50 per cent of them were well aware of this activity. About 65.93, 89.69 and 55.31 per cent of the fisherwomen had well aware about auctioning, fish transportation and working as labourer in processing industries respectively.

In mussel culture, about 76.87 per cent of the fisherwomen had not aware of this small-scale fisheries activity. As far as providing technical help in processing plants activity is concerned, about 63.44 per cent of the fisherwomen had not aware of the activity. The fisherwomen who were well aware, aware and somewhat aware levels were about 18.44, 11.56 and 6.56 respectively.

About 40.00, 49.06 and 34.68 per cent of the respondents had well aware of working in fish sales centres, fabrication of fish cages and making/ repairing baskets respectively. However, about 90.31, 85.62 and 70.00 per cent of the respondents had well aware of preparation of fish pickle, prawn pickle and masmin respectively.

In the preparation of fishery products like Chitosan, Agar agar, shark fin rays and fish wafers, about 94.06, 97.19, 65.31 and 59.69 per cent of the respondents had not aware of these activities respectively. About 40.93 per cent of the fisherwomen had well aware of the preparation fish soup powder and about 29.38 per cent of them had not aware of this activity. As far as preparation of dried fish with masala, fish meal, shark liver oil and shell crafts are concerned, about 62.19, 68.44, 62.81 and 79.06 per cent of them had well aware of these activities respectively.

Among the respondents, about 48.75 per cent of the respondents had well aware of chank diving. The fisherwomen who were aware, somewhat aware and not aware levels were about 12.19, 10.00 and 29.06 per cent respectively. In fish frying and selling, about 50.62 per cent of the respondents had well aware of this activity. However, only 6.25 per cent of the fisherwomen were not aware of this activity.

It could be observed from the Table 19 and Figure 3 that about 59.04 per cent of the respondents had well aware of selected small-scale fisheries activities. About 12.32, 6.63 and 22.01 per cent of the respondents had aware, somewhat aware and not aware levels respectively. These findings are in line with the finding of Sukumar *et al.* (1987 a) and Ahilan (1999) who reported that most of the fisherwomen were aware of small-scale fisheries enterprises.

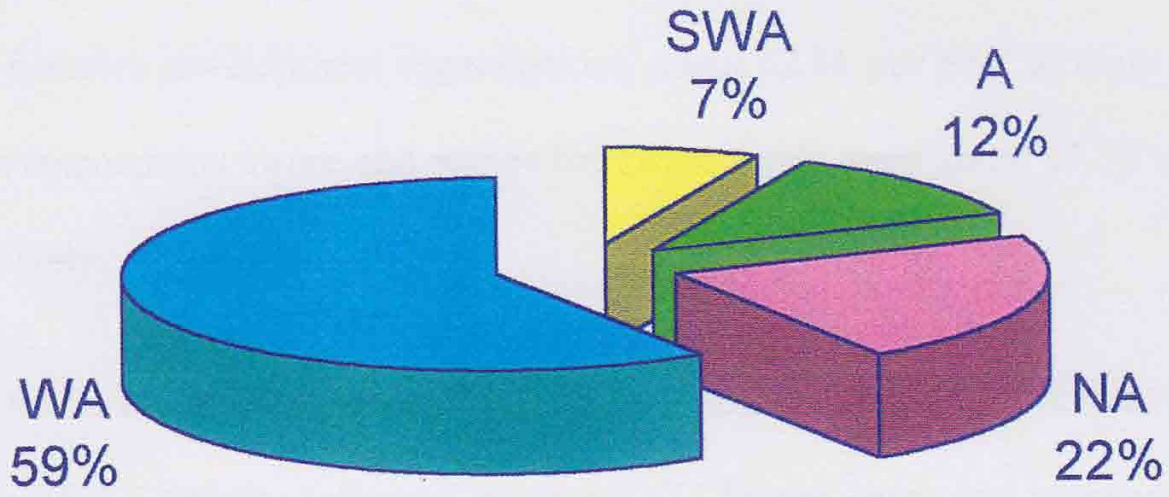
Table 19. **Awareness level of fisherwomen in small-scale fisheries activities**

No.	Small-scale fisheries activities	Well aware		Aware		Somewhat aware		Not aware		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
1	Collection of prawn seeds	180	56.25	80	25.00	49	15.31	11	3.44	320	100
2	Collection of sea shells	212	66.25	70	21.88	29	9.06	9	2.81	320	100
3	Sun drying of fish	320	100.00	0	0	0	0	0	0	320	100
4	Salting of fish	320	100.00	0	0	0	0	0	0	320	100
5	Seaweed collection	49	15.31	19	5.94	7	2.19	245	76.56	320	100
6	Seaweed culture	47	14.69	18	5.63	9	2.81	246	76.87	320	100
7	Marketing of fish and fishery products	280	87.50	21	6.56	19	5.94	0	0	320	100
8	Act as a auctioneer	211	65.93	70	21.88	21	6.56	18	5.63	320	100
9	Act as a retailer	320	100.00	0	0	0	0	0	0	320	100
10	Transportation	287	89.69	33	10.31	0	0	0	0	320	100
11	Labourer in processing firms	177	55.31	73	22.81	51	15.94	19	5.94	320	100
12	Mussel culture	42	13.13	19	5.94	13	4.06	246	76.87	320	100
13	Technical help in processing plants	59	18.44	37	11.56	21	6.56	203	63.44	320	100
14	Work in sales centres	128	40.00	80	25.00	59	18.44	53	16.56	320	100
15	Fabrication of fish cages	157	49.06	79	24.68	42	13.13	42	13.13	320	100
16	Make/repair baskets	111	34.68	71	22.19	54	16.88	84	26.25	320	100

Contd...

17	Preparation of fish pickle	289	90.31	31	9.69	0	0	0	0	320	100
18	Preparation of prawn pickle	274	85.62	40	12.50	6	1.88	0	0	320	100
19	Preparation of masmin	224	70.00	64	20.00	32	10.00	0	0	320	100
20	Preparation of Chitosan	12	3.75	5	1.56	2	0.63	301	94.06	320	100
21	Preparation of Agar agar	7	2.18	2	0.63	0	0	311	97.19	320	100
22	Preparation of shark fin rays	56	17.50	31	9.69	24	7.50	209	65.31	320	100
23	Preparation of fish wafers	61	19.06	39	12.19	29	9.06	191	59.69	320	100
24	Preparation of fish soup powder	131	40.93	51	15.94	44	13.75	94	29.38	320	100
25	Preparation of dried fish with masala	199	62.19	97	30.31	24	7.50	0	0	320	100
26	Preparation of fish meal	219	68.44	72	22.50	29	9.06	0	0	320	100
27	Preparation of shark liver oil	201	62.81	77	24.06	42	13.13	0	0	320	100
28	Preparing shell crafts	253	79.06	51	15.94	16	5.00	0	0	320	100
29	Lime shell collection	320	100.00	0	0	0	0	0	0	320	100
30	Beach side sale	320	100.00	0	0	0	0	0	0	320	100
31	Chank diving	156	48.75	39	12.19	32	10.00	93	29.06	320	100
32	Net mending / repairing	320	100.00	0	0	0	0	0	0	320	100
33	Fish frying and selling	162	50.62	71	22.19	67	20.94	20	6.25	320	100
34	Icing of fish	320	100.00	0	0	0	0	0	0	320	100
	Mean		**59.04**		**12.32**		**6.63**		**22.01**	**320**	**100**

Figure 3. Awareness level of fisherwomen in small-scale fisheries



WA = Well aware
SWA = Somewhat aware
A = Aware
NW = Not aware

4. 2. 2. Awareness of the respondents in the activities of fisheries development organisations

It is seen from the Table 20 that about 65.94 per cent of the respondents had well ware of the administrative activities of the fisheries development organisations followed by aware (28.75 per cent) and somewhat (5.31 per cent) levels. In the teaching activity of the fisheries development organisations, about 62.81 per cent of them had well awareness. The respondents aware and somewhat aware levels were about 27.19 and 10.00 per cent respectively.

As far as the research activity was concerned, about 58.44 per cent of them had well aware of the activity followed by aware (31.56 per cent) and somewhat aware (10.00 per cent) levels. In the extension activity, about 82.19 per cent of the respondents had well aware of this activity. The respondents aware were about 16.56 per cent.

About 87.50 per cent of the fisherwomen had well aware of welfare activities of the fisheries development organisations and about 12.50 per cent of them had only aware of the welfare activity.

More than 50 per cent of the respondents had well aware of self-help group activities followed by aware (26.56 per cent) and somewhat aware (17.50 per cent) levels. In the developmental activities of the fisheries development organisations, about 52.81 per cent of the respondents had well aware of this activity. The fisherwomen who had aware and somewhat aware were about 20.94 and 26.25 per cent respectively.

Table 20. Awareness level of fisherwomen in the activities of fisheries development organisations

No	Activities	Well aware		Aware		Somewhat aware		Not aware		Total	
		No.	%	No.	%	No.	%	No	%	No.	%
1	Administrative i) Honorary services	211	65.94	92	28.75	17	5.31	0	0	320	100
2	Teaching i) Literacy programme	201	62.81	87	27.19	32	10.00	0	0	320	100
3	Research i)Field studies	187	58.44	101	31.56	32	10.00	0	0	320	100
4	Extension i) Awareness programmes ii) Demonstrations iii) Exhibitions iv) Training programmes v) Seminars	263	82.19	53	16.56	4	1.25	0	0	320	100
5	Welfare i) Free housing ii) Group insurance iii) Health programmes iv) Saving-cum-relief scheme	280	87.50	40	12.50	0	0	0	0	320	100
6	Self-help group i) Credit and loans ii) Group formation	179	55.94	85	26.56	56	17.50	0	0	320	100
7	Developmental i) Leadership development ii)Youth development	169	52.81	67	20.94	84	26.25	0	0	320	100
	Mean		**66.52**		**23.44**		**10.04**	**0**	**0**	**320**	**100**

It could be inferred from the Table 20 that about 66.52 per cent of the fisherwomen had well aware of the activities of fisheries development organisations, about

23.44 per cent of them had aware and about 10.04 per cent of them had only somewhat aware of the activities of fisheries development organisations. All the respondents in one way or other knew the selected activities of fisheries development organisations.

4.2.3. Inter-correlation analysis of independent variables

The results of inter-correlation analysis are presented in the Appendix - V. The variables, which had higher inter-correlation among themselves were scrutinised and one out of the two were eliminated to reduce the multicollinerity effect. For instance the variable communication status (X_4) was eliminated which was found having high correlation with information source exposure (X_{10}). Similarly experience in small-scale fisheries (X_7) and annual expenditure (X_9) were also eliminated which were found having high correlation with age (X_1) and annual income (X_8) respectively. The rest of 13 independent variables were utilised for analysis purpose.

4.2.4. Relationship between the characteristics of respondents with their awareness level

It could be observed from the Table 21 that age, size of labour force, annual expenditure and decision making pattern had shown non-significant relationship with the awareness level in small-scale fisheries and activities of fisheries development organisations. Whereas, the all the other variables have established significant and positive relationship with the awareness level. The dependent variable viz., knowledge and participation were found to have significant and positive relationship with awareness level.

Table 21. Correlation between the characteristics of respondents and their awareness level

Variable No.	Independent variable	r- value
X_1	Age	-0.2703 NS
X_2	Educational status	0.8459**
X_3	Social participation status	0.3749**
X_5	Socio-economic status	0.5649**
X_6	Size of labour force	0.0294 NS
X_8	Annual income	0.4569**
X_{10}	Information source exposure	0.7498**
X_{11}	Extension system linkage	0.5695**
X_{12}	Risk orientation	0.6678**
X_{13}	Economic motivation	0.5339**
X_{14}	Scientific orientation	0.7559**
X_{15}	Decision making pattern	0.1601 NS
X_{16}	Spouse cooperation	0.7409**
	Dependent variables	
Y_2	Knowledge	0.7941**
Y_3	Participation	0.8384**

** significant at 0.01 level NS Not significant

4.2.5. Extent of contribution and relative importance of variables in explaining variation in the level of awareness

The results of multiple regression analysis of awareness level are depicted in the Table 22. It indicates that all the independent variables together contributed 71.03 per cent of total variation on the awareness in small-scale fisheries and the activities of fisheries development organisations as indicated by the R^2 value. The F value was found significant at 0.01 level.

Table. 22. Multiple regression analysis of independent variables with their awareness level

Variable No.	Independent variables	Regression coefficient	t-value
X_1	Age	-2.9991	1.6932 NS
X_2	Educational status	9.1173	3.6697 **
X_3	Social participation status	12.4589	3.9461**
X_5	Socio-economic status	9.1632	3.0397**
X_6	Size of labour force	3.5139	1.8954 NS
X_8	Annual income	9.8509	4.1339**
X_{10}	Information source exposure	10.5097	3.0073**
X_{11}	Extension system linkage	12.9349	3.0378**
X_{12}	Risk orientation	0.4551	0.1394 NS
X_{13}	Economic motivation	8.3359	2.9991**
X_{14}	Scientific orientation	1.0207	0.2694 NS
X_{15}	Decision making pattern	1.5096	0.6154 NS
X_{16}	Spouse cooperation	14.9569	3.9451**

R^2 =71.03 % F= 12.9654** ** Significant at 0.01 level NS = Not significant

The variables educational status, social participation status, socio-economic status, annual income, information source exposure, extension system linkage, economic motivation and spouse cooperation have established significant and positive relationship with the awareness level. The other variables like age, size of labour force, risk orientation, scientific orientation and decision making pattern had no significant relationship.

This indicates that an unit increase in educational status, social participation status, socio-economic status, annual income, information source exposure, extension system linkage, economic motivation and spouse cooperation would increase the awareness level by 9.11, 12.45, 9.16, 9.85, 10.50, 12.93, 8.33 and 14.95 units respectively.

It could be concluded that educational status, social participation status, socio-economic status, annual income, information source exposure, extension system linkage, economic motivation and spouse cooperation would have helped the fisherwomen to know more of small-scale fisheries and the activities of fisheries development organisations.

Step-down regression analysis was carried out to determine the influence of independent variables on awareness level in small-scale fisheries and the activities of fisheries development organisations and to eliminate other less important variables. The results are presented in the Table 23.

Table 23. Step-down regression analysis of independent variables with awareness level

Variable No.	Independent variables	Regression coefficient	t-value
X_3	Social participation status	8.5321	2.9334**
X_5	Socio-economic status	7.5494	5.9337**
X_8	Annual income	8.9999	3.7210**
X_{13}	Economic motivation	9.9215	2.9411**
X_{16}	Spouse cooperation	7.1168	3.3917**

R^2 = 57.39 % F= 17.9204** ** = Significant at 0.01 level

It could be inferred that an unit increase in social participation status, socio-economic status, annual income, economic motivation and spouse cooperation, **ceteris paribus**, would increase the awareness level by 8.35, 7.54, 8.99, 9.92 and 7.11 units respectively. Higher social participation status, socio-economic status, annual income, economic motivation and cooperation from spouse might have helped them to aware of small-scale fisheries technologies and the activities fisheries development organisations.

4.2.6. Knowledge level of the women in small-scale fisheries and the activities of fisheries development organisations

In this study knowledge referred to the specific recommended fisheries technology known in the small-scale fisheries as well as knowledge on the activities of fisheries development organisations. The knowledge levels of women on small-scale fisheries and the activities of fisheries development organisations activities were measured by using the standardised knowledge test developed for the study.

A perusal of Table 24 and Figure 4 shown that about 67.19, 20.62 and 12.19 per cent of the women had medium, high and low levels of knowledge in small-scale fisheries and the activities of fisheries development organisations respectively. The findings of the present study are in accordance with the findings of Veeraputhiran (1988) and Sheela (1995) who reported that half of the total respondents had medium level of knowledge.

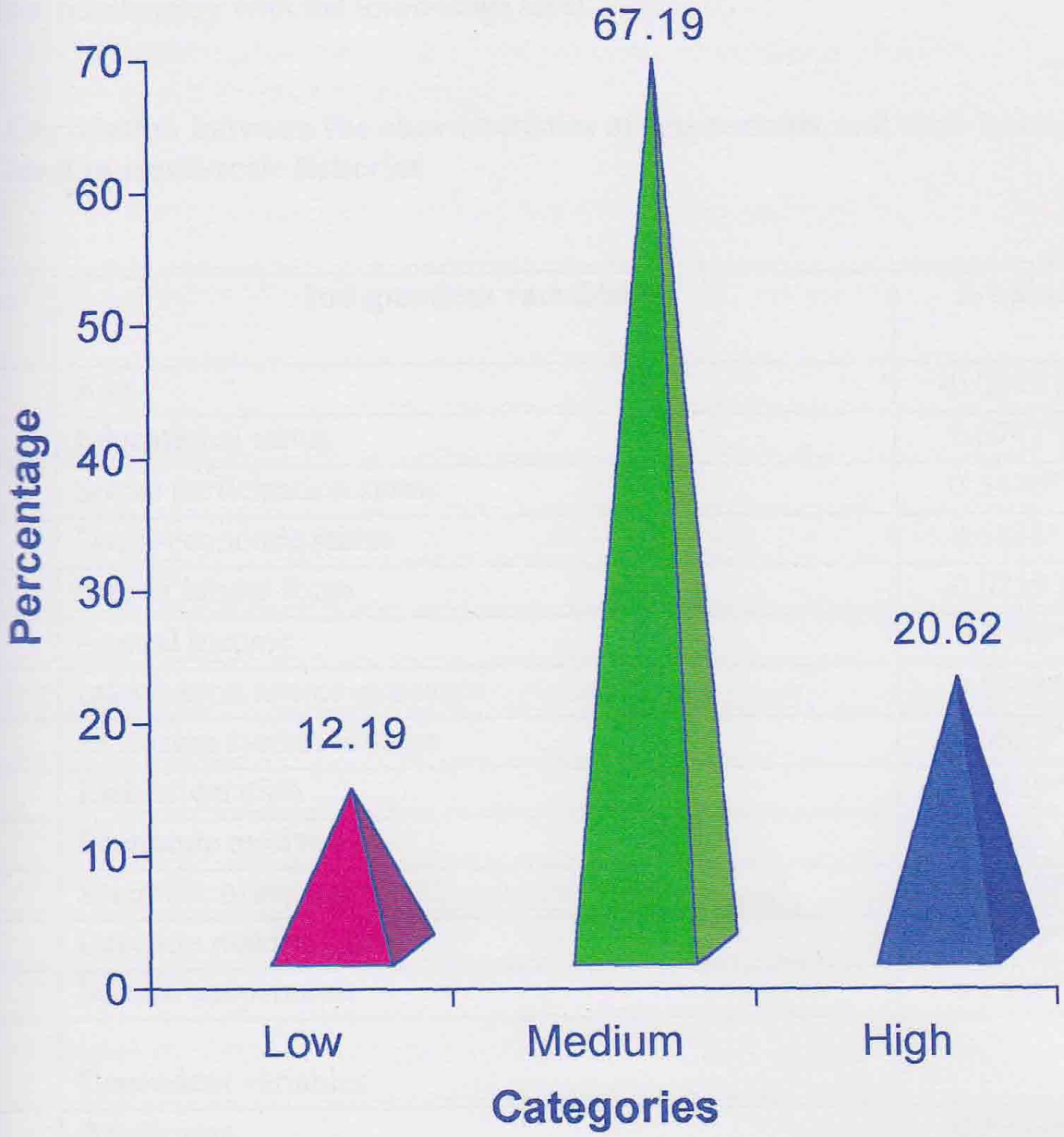
Table 24 Distribution of respondents according to their level of knowledge on small-scale fisheries and the activities of fisheries development organisations

No	Level of knowledge	No	Percentage
1	Low	39	12.19
2	Medium	215	67.19
3	High	66	20.62
		320	**100.00**

4.2.7. Relationship between the characteristics of respondents with their knowledge level

It could be observed from the Table 25 that age, size of labour force and economic motivation had shown no-significant relationship with the knowledge level in small-scale fisheries activities. Where as the other variables, viz., educational status, social

Figure 4. Distribution of fisherwomen according to their level of knowledge on small-scale fisheries and the fisheries development organisations



participation status, socio-economic status, annual income, information source exposure, extension system linkage, risk orientation, scientific orientation, decision making pattern and spouse cooperation have established significant and positive relationship with knowledge level. The two dependent variables viz., awareness and participation had exhibited positive and significant relationship with the knowledge level.

Table 25. Correlation between the characteristics of respondents and their knowledge level in small-scale fisheries

Variable No.	Independent variables	r- value
X_1	Age	-0.0623 NS
X_2	Educational status	0.6742**
X_3	Social participation status	0.5348**
X_5	Socio-economic status	0.6188**
X_6	Size of labour force	-0.0239 NS
X_8	Annual income	0.7348**
X_{10}	Information source exposure	0.5388**
X_{11}	Extension system linkage	0.6853**
X_{12}	Risk orientation	0.5439**
X_{13}	Economic motivation	0.1062 NS
X_{14}	Scientific orientation	0.4659**
X_{15}	Decision making pattern	0.6479**
X_{16}	Spouse cooperation	0.7409**
	Dependent variables	
Y_1	Awareness	0.8391**
Y_3	Participation	0.7311**

** Significant at 0.01 level NS = Not significant

It could be concluded that the higher level of variables like educational status, social participation status, socio-economic stats, annual income, information source exposure, extension system linkage, risk orientation, scientific orientation decision making

pattern and spouse cooperation probably facilitated the fisherwomen to seek and acquire good knowledge on the small-scale fisheries from various sources like fisheries development organisations, cooperative societies, non-governmental organisations, mass media, private dealers of fishing gears, professional money lenders and friends and relatives.

4.2.8 Extent of contribution and relative importance of variables in explaining variation in the level of knowledge

The results of multiple regression analysis of knowledge level are depicted in the Table 26. It indicates that all the independent variables contributed 69.99 per cent variation in the knowledge level in small-scale fisheries and the activities of fisheries development organisations as shown by the R^2 value. The F value was found highly significant at 0.01 level. The variables educational status, social participation status, socio-economic status, information source exposure, economic motivation, decision making pattern and spouse cooperation contributed significantly and positively whereas, the other variables exhibited no-significant influence.

This indicates that keeping all the factors constant, an unit of increase in educational status, social participation status, socio-economic status, information source exposure, economic motivation, decision making pattern and spouse cooperation would increase the knowledge level by 3.01, 4.05, 8.04, 3.70, 3.27, 4.99 and 3.40 units respectively. It is quite possible that higher educational status, social participation status, socio-economic status, information source exposure, economic motivation, decision making pattern and spouse cooperation would have helped the fisherwomen to acquire more knowledge on small-scale fisheries and the activities of fisheries development organisations.

Table 26. Multiple regression analysis of independent variables with their knowledge level

Variable No.	Independent variable	Regression coefficient	t- value
X_1	Age	-0.3998	1.4398 NS
X_2	Educational status	3.0109	2.8641 **
X_3	Social participation status	4.0599	2.6989 **
X_5	Socio-economic status	8.0491	3.2615 **
X_6	Size of labour force	-0.1546	0.3287 NS
X_8	Annual income	0.0845	0.5627 NS
X_{10}	Information source exposure	3.7061	2.0740 *
X_{11}	Extension system linkage	0.1968	0.2004 NS
X_{12}	Risk orientation	0.4001	0.6241 NS
X_{13}	Economic motivation	3.2789	2.6497 **
X_{14}	Scientific orientation	0.2005	0.3864 NS
X_{15}	Decision making pattern	4.9987	3.0099 **
X_{16}	Spouse cooperation	3.4001	2.7921 **

$R^2 = 69.99\ \%$ F= 8.1754 ** * = Significant at 0.05 level
** = Significant at 0.01 level NS = Not Significant

Step-down regression analysis was carried out to determine the influence of independent variables on knowledge eliminating other less important variables. The results are presented in the Table 27.

It is obvious that as age increases it would reduce the retention capacity and interest. If the working labour force in their family were more, they would not prefer learning more fisheries activities. This might be the possible reason for the age and size of labour force having negative influence with the knowledge, which are in conformity with the findings of Veeraputhiran (1988).

Table 27. Step down regression analysis of independent variable with knowledge level

Variable No.	Independent variable	Regression coefficient	t- value
X_1	Age	-1.0429	2.7192 **
X_6	Size of labour force	-2.9487	2.0099 *
X_8	Annual income	3.3949	3.5429 **
X_{11}	Extension system linkage	3.5934	3.2761 **
X_{14}	Scientific orientation	7.1199	3.3309 **
X_{16}	Spouse cooperation	7.3879	5.9208 **

R^2 = 52.69 % F= 20.832**

* = Significant at 0.05 level
** = Significant at 0.01 level

4.3. Extent of participation

4.3.1. Extent of participation in small-scale fisheries

Occupationalwise fishing appears to offer the main refuge to the working women in the fishing communities and almost all of them participate in one or other activities related to fishing and this a common feature in all the coastal villages in the state.

In this study an inventory was developed and used for measuring the extent of participation of women in small-scale fisheries and in the activities of fisheries development organisations. The score computed was considered as the total extent of participation of individual woman in small-scale fisheries activities and the activities of fisheries development organisations and used for further analysis. The results and interpretations are presented in subsequent paragraphs.

From the Table 28, it is evident that 45.94 per cent of the fisherwomen had participated in the collection of prawn seeds under self-doing followed by under supervision (9.69 per cent), collaboration with others (12.19 per cent) and 32.18 per cent of them were not participated. Alagarswamy (1992) also reported the participation of women in the collection of prawn seeds. In the collection of sea shells 63.13 per cent of respondents participated on their own followed by under supervision (8.75 per cent), collaboration with others (15.63 per cent) and 12.50 per cent of the fisherwomen were not participated. As far as the sun drying of fishes was concerned, about 93.75 per cent of them had participated on their own (Plate -1).

Table 28. Extent of participation of fisherwomen in small-scale fisheries activities

No.	Small-scale fisheries activities	Self-doing		Under supervision		Collaboration with others		Not participated		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
1	Collection of prawn seeds	147	45.94	31	9.69	39	12.19	103	32.18	320	100
2	Collection of sea shells	202	63.13	28	8.75	50	15.63	40	12.50	320	100
3	Sun drying of fish	300	93.75	6	1.88	10	3.13	4	1.25	320	100
4	Salting of fish	290	90.63	9	2.81	17	5.31	4	1.25	320	100
5	Seaweed collection	35	10.94	17	5.31	21	6.56	247	77.19	320	100
6	Seaweed culture	0	0	0	0	0	0	320	100.00	320	100
7	Marketing of fish and fishery products	239	74.69	29	9.06	20	6.25	32	10.00	320	100
8	Act as a auctioneer	40	12.50	9	2.81	16	5.00	255	79.69	320	100
9	Act as a retailer	259	80.94	17	5.31	39	12.19	5	1.56	320	100
10	Transportation	250	78.13	11	3.44	52	16.25	7	2.18	320	100
11	Labourer in processing firms	100	31.26	27	8.43	5	1.56	188	58.75	320	100
12	Mussel culture	0	0	0	0	0	0	320	100.00	320	100
13	Technical help in processing plants	8	2.50	7	2.19	8	2.50	297	92.81	320	100
14	Work in sales centres	70	21.88	19	5.94	37	11.56	194	60.62	320	100
15	Fabrication of fish cages	125	39.06	39	12.19	37	11.56	119	37.19	320	100
16	Make/repair baskets	100	31.25	29	9.06	9	2.81	182	56.88	320	100

Contd...

17	Preparation of fish pickle	196	61.25	47	14.69	69	21.56	8	2.50	320	100
18	Preparation of prawn pickle	136	42.50	96	30.00	77	24.06	11	3.44	320	100
19	Preparation of masmin	198	61.88	21	6.56	36	11.25	65	20.31	320	100
20	Preparation of Chitosan	0	0	0	0	0	0	320	100.00	320	100
21	Preparation of Agar agar	0	0	0	0	0	0	320	100.00	320	100
22	Preparation of shark fin rays	0	0	0	0	0	0	320	100.00	320	100
23	Preparation of fish wafers	55	17.19	12	3.75	21	6.56	232	72.50	320	100
24	Preparation of fish soup powder	63	19.69	6	1.88	29	9.06	222	69.37	320	100
25	Preparation of dried fish with masala	125	39.06	0	0	97	30.31	98	30.63	320	100
26	Preparation of fish meal	0	0	11	3.44	9	2.81	300	93.75	320	100
27	Preparation of shark liver oil	0	0	18	5.63	17	5.31	285	89.06	320	100
28	Preparing shell crafts	185	57.81	39	12.19	27	8.44	69	21.56	320	100
29	Lime shell collection	210	65.63	0	0	47	14.69	63	19.68	320	100
30	Beach side sale	208	65.00	31	9.69	77	24.06	4	1.25	320	100
31	Chank diving	17	5.31	9	2.81	32	10.00	262	81.88	320	100
32	Net mending / repairing	218	68.13	32	10.00	50	15.62	20	6.25	320	100
33	Fish frying and selling	92	28.75	0	0	37	11.56	191	59.69	320	100
34	Icing of fish	211	65.94	47	14.68	34	10.63	28	8.75	320	100
	Mean		**37.50**		**5.94**		**9.37**		**47.19**		**100**

About 90.63 per cent of the women had participated in salting of fish on their own whereas about 2.81 and 5.31 per cent of them had participated under supervision and collaboration categories respectively. Sukumar *et al.* (1987 a) reported that the fisherwomen were participating in the preparation of dry fish.

In the collection of seaweeds, about 77.19 per cent of the fisherwomen were not participated. About 10.94 per cent of the fisherwomen had participated on their own. In marketing of fish and fishery products 74.69 per cent of the respondents took part on their own. Tempelman (1985), Anbarasan and Fernandez (1986), Jegatheesan (1987), Tempelman (1987) and Nayak (1992) also reported that many of the fisherwomen had participated in fish marketing.

Many of the fisherwomen (79.69 per cent) did not act as auctioneer and about 12.50 per cent of them had participated in auctioning of fishes (Plate-2). However, about 80.94 per cent of the respondents acted as fish retailer (Plates -3 and 4).

In fish transportation about 78.13 per cent had participated on their own. Yap (1987) observed that the fisherwomen were also involved in the distribution of fish catches. As far as working as labourer in fish processing firm, about 58.75 per cent did not participate while about 31.26 per cent of them had participated (Plates - 5 and 6).

About 92.81, 60.62 and 56.88 per cent of fisherwomen did not participate in providing technical helps in fish processing industries, fish sales centres and making / repairing of baskets respectively.

Plate 1 **Sun drying of fishes by a fisherwoman**

Plate 2 **A fisherwoman auctioning fishes in the market**

Plate 3 Fisherwomen selling fishes in the market

Plate 4 A fisherwoman selling dried fishes in the market

Plate 5 **A Fisherwoman working as labourer in the traditional processing firm**

Plate 6 **Fisherwomen deboning and deskinning the fishes for hotels and restaurants**

About 39.06 per cent of the respondents participated in fabrication of fish cages on their own. Only 12.19 and 11.56 per cent of the respondents had participated under supervision and collaboration with others respectively. Amalore (1996) also observed that the fisherwomen were involved in making of fish baskets.

In the preparation of fish pickle, about 61.25 per cent of the fisherwomen participated on their own, followed by under supervision (14.69 per cent), collaboration with others (21.56 per cent) and only very meagre percentage (2.50 per cent) of them were not participated (Plate -7). Sanjeeviraj *et al.* (1991) reported that about 50 per cent of the fisherwomen were engaged in the preparation of fish pickle. About 42.50 per cent of the respondents had participated in the preparation of prawn pickle on their own. In the preparation of masmin, about 61.88 per cent of the fisherwomen participated on their own whereas only 6.56 and 11.25 per cent of them had participated under supervision and collaboration with others. About 20.31 per cent of them did not participate.

About 72.50 per cent of the fisherwomen were not participated in the preparation of fish wafers. In the preparation of fish soup powder, about 69.37 per cent of the fisherwomen did not participate and only 19.69 per cent of them participated on their own. In the preparation of dried fish with masala, the fisherwomen participated on their own were about 39.06 per cent while 30.31 per cent of them participated under collaboration with others. About 30.63 per cent of them did not participate at all. The fisherwomen who did not participate in the preparation of fish mal were about 93.75 per cent.

About 89.06 per cent of the respondents were not participated in the preparation of shark liver oil. However, Jegatheesan (1987), Sukumar *et al.* (1987a), Veeraputhiran (1988), Nair and Kandoran (1992) and Sukumar *et al.* (1992) reported that the fisherwomen were involved in the preparation of various value added fishery by-products like preparation of fish and prawn pickles, fish wafers, fish soup powder, etc.

About 57.81 per cent of the respondents had participated in preparing marine shell crafts (Plates - 8 and 9) under self-doing category. In the collection of lime shells about 65.63 per cent had participated on their own while 19.68 per cent of them were not participated (Plate - 10).

About 65.00 per cent of the respondents had participated on their own in beach side sale whereas about 24.06 per cent of them participated in collaboration with others (Plate - 11). However, about 81.88 per cent did not participate in chank diving.

About 68.13 per cent of the women had participated in net mending / repairing on their own (Plate - 12). This finding is in concordance with the findings of Natpracha (1986), Jegatheesan (1987) Srinath (1987), Sukumar *et al.* (1987b), Yap (1987) and Nayak (1992).

About 59.69 per cent of respondents did not participate in fish frying and selling while 28.75 per cent of them participated under self-doing. In icing of fish about 65.94 per cent of them had participated on their own while 14.68 and 10.63 per cent of them participated under supervision and collaboration with others respectively. However, none of fisherwomen participated in the small-scale fisheries technologies like

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Plate 7 **Labelling of fish pickle bottles prepared by the trained fisherwomen**

Plate 8 **A fisherwoman cleaning chanks for preparing shell crafts**

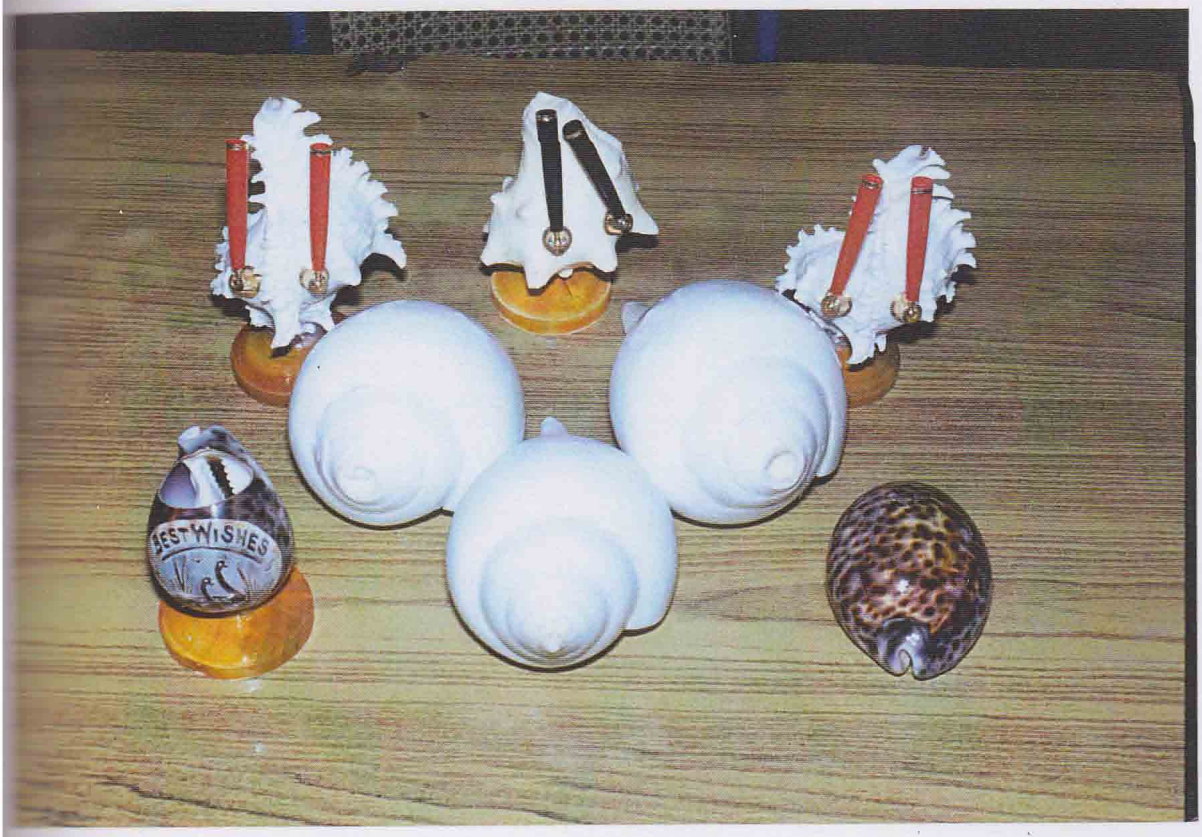


Plate 9 Shell crafts prepared by the fisherwomen

Plate 10 A Fisherwoman separating shells for lime production

Plate 11 **A Fisherwoman fabricating nylon net for inshore fishing**

Plate 12 **A fisherwoman cleaning the fishes in beach side for sale**

seaweed culture, mussel culture, preparation of chitosan, agar agar and shark fin rays due to complicated procedures / operations.

It could be observed from the Table 29 and Figure 5 that about 37.50 per cent of the women had participated in small-scale fisheries activities by themselves. While 5.94 per cent of the women involved under supervision or guidance of someone whereas about 9.37 per cent of them participated in collaboration with other co-workers. In other words, about 52.81 per cent of the women participated in the selected small-scale fisheries activities while 47.19 per cent of them did not participate in any of the fisheries activities. The probable reasons for this might be the low per capita income of the fisherfolk families and inadequate credit facilities.

Table 29. Kinds of participation of fisherwomen in small-scale fisheries

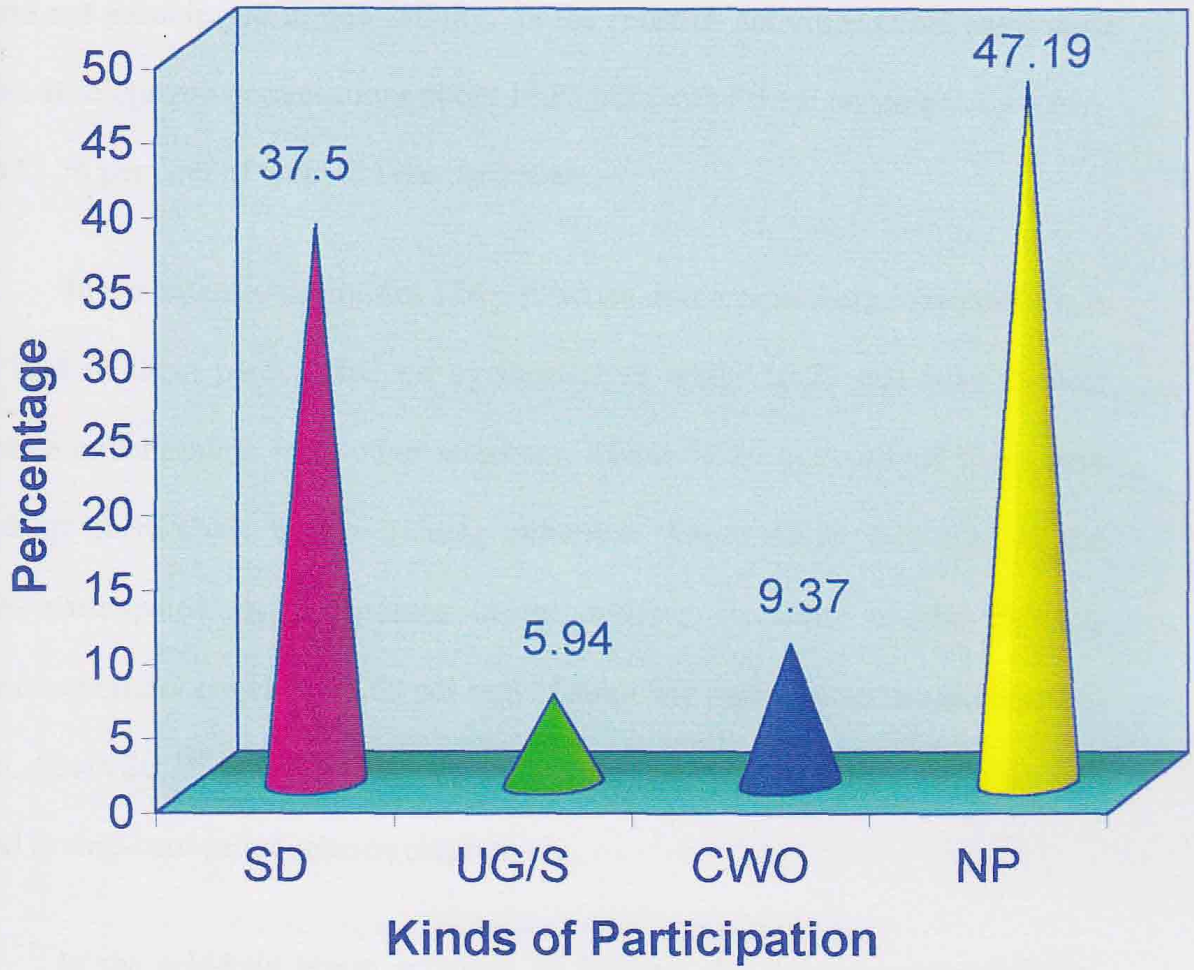
No.	Kinds of participation	No.	Percentage
1	Self-doing	120	37.50
2	Under guidance / supervision	19	5.94
3	Collaboration with others	30	9.37
4	Not participated	151	47.19
		320	**100.00**

4.3.2. Extent of participation in fisheries development organisations

The involvement of fisherwomen in the different activities of fisheries development organisations could be observed from the Table 30.

In the administrative activities (honorary services) of fisheries development organisations about 35 per cent of them participated on their own while about 52.19 per cent of them not participated. About 16.88, 14.68 and 16.88 per cent of

Figure 5. Kinds of particiaption of fisherwomen in small-scale fisheries



SD = Self doing
UG/S = Under guidance / supervision
CWO = Collaboration with others
NP = Not participated

the fisherwomen participated in the activities fisheries development organisations on their own, under supervision and collaboration with others respectively while about 51.56 per cent of them not participated in this activity. In the research activities (field studies) of the fisheries development organisations about 16.88 per cent of them participated on their own while 51.56 per cent of them did not participate.

In the extension activities of the fisheries development organisations about 71.88 per cent of them participated on by themselves while 16.25 per cent of them participated in collaboration with other members. About 40.94 per cent of them were participated by themselves in the training activities. About 65.94 per cent of the respondents participated by themselves in the welfare activities of the fisheries development organisations while 20.63 per cent of them had participated in collaboration with others. About 20.31 and 25.94 per cent of them participated on their own in the free housing and saving-cum-relief-scheme respectively.

In the self-help group activities of fisheries development organisations, about 64.06 per cent of them participated on their own whereas about 19.37 per cent of them had participated in this activity in collaboration with other members. About 50.31 per cent of the fisherwomen participated by themselves in the developmental activities of the fisheries development organisations whereas about 30.94 per cent of them not participated. About 43.44 per cent of them participated by themselves in leadership development.

None of the fisherwomen participated in the teaching activity of the fisheries development organisations.

Table 30. Extent of participation in the activities of fisheries development organisations

No.	Activities	Self-participation		Under supervision		Collaboration with others		Not participated		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
1	***Administrative*** i) Honorary services	112	35.00	28	8.75	13	4.06	167	52.19	320	100
2	***Teaching*** i) Literacy programme	0	0	0	0	0	0	320	100	320	100
3	***Research*** i) Field studies	54	16.88	47	14.68	54	16.88	165	51.56	320	100
4	***Extension*** i) Awareness programmes	23	7.19	--	--	--	--	--	--	--	--
	ii) Demonstrations	12	3.75	8	2.50	--	--	--	--	--	--
	iii) Exhibitions	52	16.25			12	3.75	--	--	--	--
	iv) Training programmes	131	40.94	--	--	40	12.50	--	--	--	--
	v) Seminars	12	3.75	--	--	--	--	--	--	--	--
	Subtotal	*230*	*71.88*	*8*	*2.5*	*52*	*16.25*	*30*	*9.37*	*320*	*100*

Contd...

5	***Welfare*** i) Free housing	65	20.31	--	--	21	6.57	--	--	--	--
	ii) Group insurance	21	6.56	15	4.69	16	5.00	--	--	--	--
	iii) Health programmes	42	13.13	6	1.88	17	5.31				
	iv) Saving-cum-relief scheme	83	25.94	--	--	12	3.75	--	--	--	--
	Subtotal	*211*	*65.94*	*21*	*6.56*	*66*	*20.63*	*22*	*6.87*	*320*	*100*
6	***Self-help group*** i) Credit and loans	114	35.63	19	5.94	23	7.19	--	--	--	--
	ii) Group formation	91	28.43	4	1.25	39	12.18	--	--	--	--
	Subtotal	*205*	*64.06*	*23*	*7.19*	*62*	*19.37*	*30*	*9.38*	*320*	*100*
7	***Developmental*** i) Leadership development	139	43.44	20	6.25	19	5.94	--	--	--	--
	ii) Youth development	22	6.87	--	--	21	6.56	--	--	--	--
	Subtotal	*161*	*50.31*	*20*	*6.25*	*40*	*12.50*	*99*	*30.94*	*320*	*100*
	Mean		**43.44**		**6.56**		**12.81**		**37.19**		**100**

It could be observed from the Table 31 and Figure 6 that about 43.44 per cent of the women had participated themselves in the activities of fisheries development organisations.

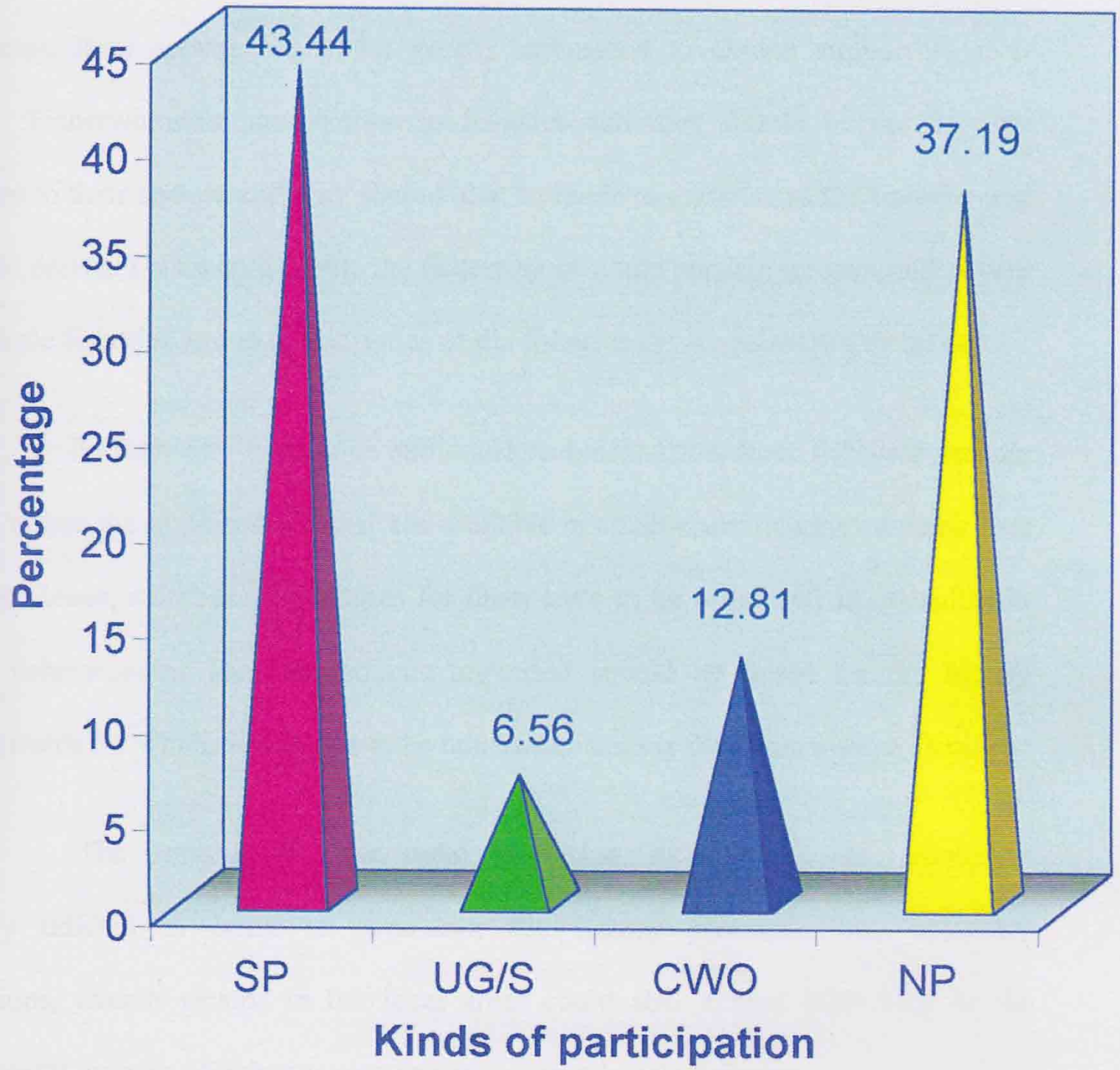
Table 31. Kinds of participation of fisherwomen in the activities of fisheries development organisations

No.	Kinds of participation	No.	Percentage
1	Self- participation	139	43.44
2	Under guidance / supervision	21	6.56
3	Collaboration with others	41	12.81
4	Not participated	119	37.19
		320	**100.00**

About 6.56 per cent of the women had participated under supervision or guidance of someone and about 12.81 per cent of them had participated in collaboration with other co-workers. It indicates that about 62.81 per cent of the women had participated in the selected activities of fisheries development organisations while 37.19 per cent of them did not participate in any of these activities.

It emerges from the above findings that the fisherwomen are participating in small-scale fisheries and the activities of fisheries development organisations for earning additional income to the family. The fisherwomen were mostly involved in the extension, welfare and self-help group activities of the fisheries development organisations. Welfare activities include, housing, community hall, cyclone shelter, credit and savings, relief, health, electricity, sanitation facilities, etc. They were also involved in training and special programmes of the fisheries development organisations.

Figure 6. Kinds of particiaption of fisherwomen in fisheries development organisations



SP = Self participation
UG/S = *Under guidance / supervision*
[illegible]
[illegible] = Not participated

Spouse and other family members are the main motivators for fisherwomen to participate in small-scale fisheries and the activities of fisheries development organisations. In promotion of participation in the fisheries development organisations, their spouse has to be greatly influenced to extend support to their ventures. Fisherwomen's participation in fisheries activities should be put in right perspective to their spouse and they should also be made to understand the benefits that they would derive. This would enable the fisherwomen could participate more effectively in small-scale fisheries and in the activities of the fisheries development organisations.

Further, due to lack of skills and technical know-how fisherwomen are unable to utilise the opportunities that are available in small-scale fisheries to their best advantage. Hence, suitable programmes for them have to be organised in consultation with the fisherwomen. The programmes organised should be based on the locally perceived needs for which survey has to be undertaken among the fisherwomen families.

The mass media like radio, television, newspapers, etc., could be effectively utilised in order to popularise the fishery products. The voluntary organisations, church groups in the local areas could also extend their help in the developmental process of fisherwomen engaged in small-scale fisheries.

In addition to this, conducting more extension activities like on-campus and off-campus training programmes, demonstrations, campaigns, on-the-spot-guidance and field visits could increase the participation level of women in small-scale fisheries.

4.4. Relationship between the characteristics of respondents and their extent of participation

It could be inferred from Table 32 that out of 13 independent variables studied, 10 variables were found to have significant relationship with the extent of participation in small-scale fisheries and in the activities of fisheries development organisations.

Table 32. Correlation between characteristics of respondents and their extent of participation in small-scale fisheries and the activities of fisheries development organisations

Variable No.	Independent variable	r- value
X_1	Age	0.0863 NS
X_2	Educational status	0.4887 **
X_3	Social participation status	0.4000 **
X_5	Socio-economic status	0.3241*
X_6	Size of labour force	-0.0926 NS
X_8	Annual income	0.6995 **
X_{10}	Information source exposure	0.6001**
X_{11}	Extension system linkage	0.2994 NS
X_{12}	Risk orientation	0.3999**
X_{13}	Economic motivation	0.4001 **
X_{14}	Scientific orientation	0.4510 **
X_{15}	Decision making pattern	0.4213 **
X_{16}	Spouse cooperation	0.8100 **
	Dependent variables	
Y_1	Awareness	0.6549 **
Y_2	Knowledge	0.8001 **

** = Significant at 0.01 level * = Significant at 0.05 level NS = Not-significant

The educational status, social participation status, socio-economic status, annual income, information source exposure, risk orientation, economic motivation,

scientific orientation, decision making pattern and spouse cooperation have established significant and positive relationship with the extent of participation.

The variables like age size of labour force and extension system linkage had no-significant relationship with extent of participation. This finding is in line with the findings of Kaul *et al.* (1987), Veeraputhiran (1988), Kiron (1992) and Ahilan (1999) who reported that education and income were positively related to participation. The dependent variables viz., awareness and knowledge were found to have highly significant and positive relationship with participation level.

4.4.1. Variables explaining the extent of variation in participation

From the Table 33, it could be seen that all the independent variables together contributed 69.11 per cent of total variation on the extent of participation in small-scale fisheries and the activities of fisheries development organisations. The F value was found significant at 0.01 level and this means that there existed a linear functional relationship between the independent and dependent variables.

Of the 13 variables, educational status, social participation status, socio-economic status, annual income, risk orientation, economic motivation and spouse cooperation had significant and positive coefficient values whereas all the other remaining variables had no-significant influence on participation. Veeraputhiran (1988) also reported that social participation and economic motivation were found to have significant positive relationship with training needs and participation.

Table 33. Multiple regression analysis of independent variables with their extent of participation in small-scale fisheries and in the activities of fisheries development organisations

Variable No.	Independent variable	Regression coefficient	t- value
X_1	Age	2.8812	1.6742 NS
X_2	Educational status	5.9498	2.5431 *
X_3	Social participation status	9.9587	2.9145**
X_5	Socio-economic status	1.9984	2.3451 *
X_6	Size of labour force	-3.3256	1.6417 NS
X_8	Annual income	8.9421	2.4423*
X_{10}	Information source exposure	4.4084	1.3330 NS
X_{11}	Extension system linkage	2.9587	1.0425 NS
X_{12}	Risk orientation	8.9854	2.1110*
X_{13}	Economic motivation	3.9990	4.3215**
X_{14}	Scientific orientation	2.1145	1.9549 NS
X_{15}	Decision making pattern	4.9578	2.1020 *
X_{16}	Spouse cooperation	11.2546	3.1425 **

R^2 = 69.11% F= 12.5421 ** ** Significant at 0.01 level
* Significant at 0.05 level NS = Not-significant

This implies that, an unit increase in educational status, **ceteris paribus,** would increase the participation by 5.94 units, an unit of increase in social participation status, would increase in the participation by 9.95 units, an unit of increase in socio-economic status, would increase in the participation by 1.99 units, an unit of increase of annual income would increase participation by 8.94 units, an unit of risk orientation would increase 8.98 units, an unit of increase in economic motivation would increase in participation by 3.99 units, an unit of increase in decision making pattern would increase the participation by 4.95 units and an unit of spouse cooperation would increase in participation by 11.25 units in small-scale fisheries and the activities of the fisheries

development organisations. The probable reason being that when the fisherwomen were more involved in fisheries development programmes and contact with development organisations their participation level in such activities would also increase. Further, higher social contacts and cooperation from their spouse motivated them to participate in small-scale fisheries and in the activities of the fisheries development organisations.

Step down regression analysis was carried out to determine the most influential independent variables. The result of the step-down regression analysis of independent variables and their influence on participation level in the small-scale fisheries and the activities of development organisations are presented in Table 34.

Table 34. Step-down regression analysis of independent variables with participation levels

Variable No.	Independent variable	Regression coefficient	t- value
X_3	Social participation status	7.4298	2.0001 *
X_5	Socio-economic status	11.0121	4.2195**
X_{13}	Economic motivation	9.0480	2.2195*
X_{15}	Decision making pattern	8.0982	2.1998 *
X_{16}	Spouse cooperation	12.6214	4.7501**

$R^2 = 49.29$ % F= 13.2450** * = Significant at 0.05 level
** = Significant at 0.01 level

The four variables viz., social participation status, socio-economic status, economic motivation and spouse cooperation put together contributed 49.29 per cent variation in extent of participation. This indicates that the total contribution of the 9 eliminated variables had accounted for 50.71 per cent variation. The regression

coefficient values were positive and significant in all the variables. It could be concluded that, a unit of increase in social participation status, socio-economic status, economic motivation decision making pattern and spouse cooperation, **ceteris paribus**, resulted increase in participation by 7.43, 11.01, 9.04, 8.09 and 12.62 units respectively.

Higher level of social participation, socio-economic status, economic motivation decision making pattern and spouse cooperation excelled the fisherwomen to know the new development in fisheries. This might have influenced the respondents to participate in small-scale fisheries and the activities of fisheries development organisations.

4. 4. 2. Effects of the independent variables on participation in small-scale fisheries and the activities of fisheries development organisations

Path analysis was employed to find out a quantitative interpretation of direct, indirect and substantial indirect effect on the level of participation. The results are furnished in Table 35 and from this it is evident that out of 13 independent variables, 8 variables were found to have substantial direct effect on the participation. Among them, based on the order of the variables, educational status (X_2), social participation status (X_3), annual income (X_8), information source exposure (X_{10}), economic motivation (X_{13}), scientific orientation (X_{14}), decision making pattern (X_{15}), and spouse cooperation (X_{16}) had positive direct effect. All the variables contributed positive indirect effects except decision making pattern (X_{15}).

As seen from the Figure 7 that out of 24 substantial indirect effects, six variables passed through spouse cooperation (X_{16}), five passed through social

participation status (X_3), four passed through annual income (X_8) three passed through socio-economic status (X_5) and decision making pattern (X_{15}) and one passed through educational status (X_2), information source exposure (X_{10}) and economic motivation (X_{13}).

From this, it could be inferred that the variables spouse cooperation, social participation status, annual income, socio-economic status and decision making pattern acted as crucial variables in influencing the participation of women in small-scale fisheries and the activities of fisheries development organisations. It could be concluded that those fisherwomen who had relatively higher levels of these variables had higher level of participation.

Table 35. Path analysis showing direct and indirect effect on independent variables on participation in small-scale fisheries and the activities of the fisheries development organisations

No.	Name of the variable	Direct effect	Rank	Indirect effect	Rank	Substantial indirect effect		
						1	2	3
X_2	Educational status	0.4887	IV	0.7912	II	0.3127 (X_8)	0.2317 (X_3)	0.3001 (X_{16})
X_3	Social participation status	0.4000	VIII	0.4002	VI	0.1577 (X_{15})	0.0245 (X_5)	0.1943 (X_{16})
X_8	Annual income	0.6995	II	0.8759	I	-0.1956 (X_5)	-0.0.045 (X_{16})	-0.0784 (X_3)
X_{10}	Information source exposure	0.6001	III	0.6412	IV	0.0941 (X_8)	0.0574 (X_{16})	-0.0800 (X_3)
X_{13}	Economic motivation	0.4001	VII	0.4517	V	0.6001 (X_8)	0.5410 (X_5)	0.4998 (X_{15})
X_{14}	Scientific orientation	0.4510	V	0.2941	VII	0.4251 (X_{16})	0.2145 (X_2)	0.4987 (X_{10})
X_{15}	Decision making pattern	0.4213	VI	-0.0014	VIII	0.4781 (X_8)	0.1845 (X_{16})	0.1948 (X_3)
X_{16}	Spouse cooperation	0.8100	I	0.7169	III	0.4712 (X_{15})	0.3994 (X_{13})	0.4572 (X_3)

Figure 7. Path diagram showing direct, indirect and substantial indirect effects of independent variables on participation

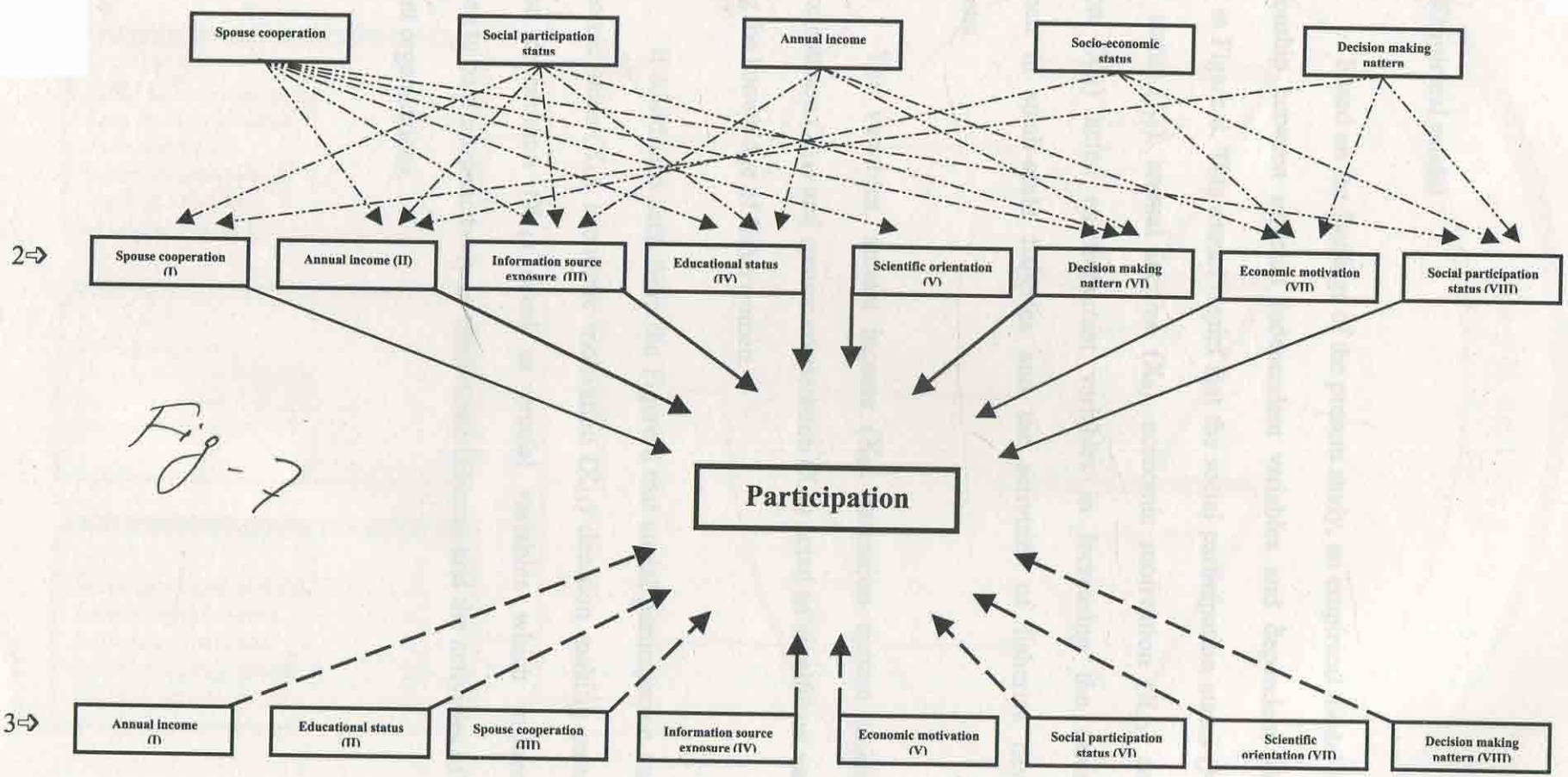


Fig-7

1 = Substantial indirect effect 2 = Direct effect 3 = Indirect effect I - VIII = Rank of direct and indirect effects

4.2.3. Empirical model

Based on the findings of the present study, an empirical model illustrating the relationship between selected independent variables and dependent variables is presented in Figure 8. This model depict that the social participation status (X_3), socio-economic status (X_5), annual income (X_8), economic motivation (X_{13}) and spouse cooperation (X_{16}) acted as important variables in increasing the awareness of fisherwomen in small-scale fisheries and the activities of fisheries development organisations.

The variables, annual income (X_8), extension system linkage (X_{11}), scientific orientation (X_{14}) and spouse cooperation (X_{16}) acted as significant variables in influencing the knowledge of fisherwomen.

It could also seen from the Figure 8 that social participation status (X_3), socio-economic status (X_5), economic motivation (X_{13}) decision making pattern (X_{15}) and spouse cooperation (X_{16}) acted as crucial variables which influenced the fisherwomen to participate actively in small-scale fisheries and the activities of fisheries development organisations.

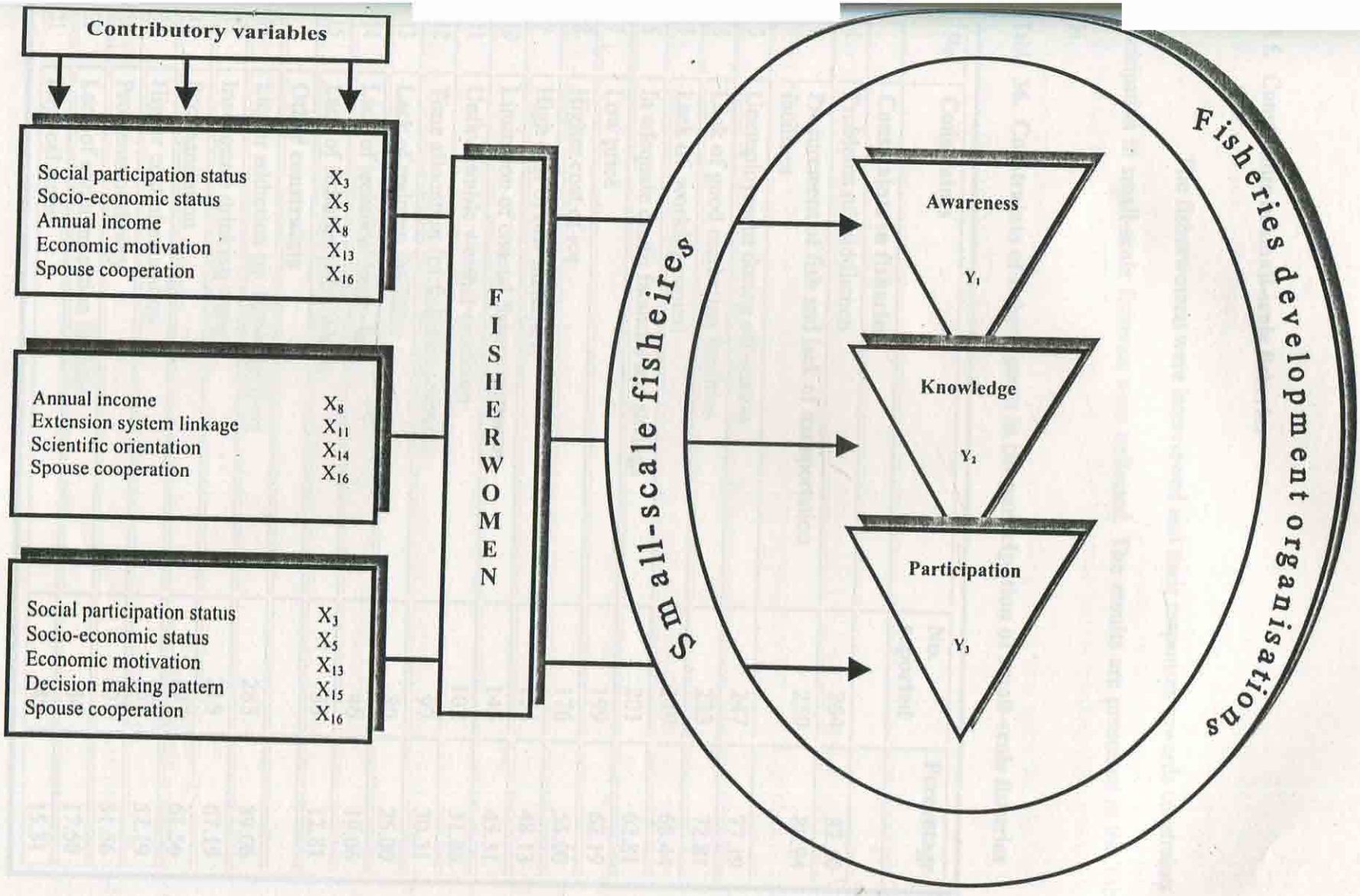


Figure 8. Empirical model of the study

4. 5. Constraints in small-scale fisheries

The fisherwomen were interviewed and their responses towards constraints in participation in small-scale fisheries were collected. The results are presented in the Table 36.

Table 36. Constraints of fisherwomen in the participation of small-scale fisheries

No.	Constraints	No. reported	Percentage
	Constraints in fisheries		
1	Problems of middlemen	264	82.50
2	Procurement of fish and lack of transportation facilities	259	80.94
3	Unemployment during off-season	247	77.19
4	Lack of good marketing facilities	233	72.81
5	Lack of working capital	219	68.44
6	In adequate credit facilities and savings	201	62.81
7	Low price	199	62.19
8	Higher cost of ice	176	55.00
9	High cost of raw materials	154	48.13
10	Limitation of coastal fishery resources	145	45.31
11	Unfavourable weather condition	102	31.86
12	Time allocation for fisheries activities	97	30.31
13	Lack of training facilities	80	25.00
14	Lack of technical know-how	46	19.06
15	Lack of fisheries publications	33	12.81
	Other constraints		
16	Liquor addiction by male members	285	89.06
17	Inadequate drinking water	215	67.19
18	Poor sanitation	197	61.56
18	Higher cost of education	167	52.19
19	Problems of dowry	101	31.56
20	Lack of communication facilities	56	17.50
21	Physical strain	49	15.31

4.5.1. Constraints in fisheries

The main constraint faced by the fisherwomen in the participation of small-scale was the problems of middlemen (Table 36). The least perceived constraint was the lack of fisheries publications (12.81 per cent). This finding is in line with the findings of Rajkumar *et al.* (1995) and Sujathkumar (2000).

Fisherwomen are generally poor and rarely possess ready capital to buy fish every day. The only option left is to borrow money. Mostly they depend on professional money lenders to meet out the unexpected expenses forcing them to sell their catches only through these people who act as a middleman. The real value of the produce is not paid to them. Therefore, formation of an organised society could solve the problems of middlemen. In addition to this, sale of the catches through the Fisheries Cooperative Societies would help in solving this problem to a greater extent.

About 80.94 per cent of the respondents expressed difficulties in procurement of fish and lack of transportation facilities as their problems. Drewes (1986) and Nair and Kandoran (1992) also reported the transportation of catches was a constraint faced by the fisherwomen. Procurement of fish is a difficult task involving much investment and expenditure.

Fish is highly perishable and has to be sold quickly. But as it is generally not allowed in public transport, the catches are usually carried to nearby markets through bicycle and tricycle by male members or fisherwomen carry themselves as head load. Fish vending by women involves hours of hard work.

The fisherwoman may travel a distance of 4-8 kilometres for buying, transporting and selling fish. The distance to be travelled depends on the place of purchase. Those who can buy their fish from wholesales markets usually cover a distance of less than 10 kilometres. Those women who had to buy fish from the sea shore not only have to spend a lot of time as the boats arrive one at a time, but also have to cover long distances. It is important that they reach the market before the day's business gets dull and before the iced fish arrives, which is brought in large quantities from distant places and sold cheaper than fresh fish. Some fisherwomen hire cyclists to carry their fish to sale points and the women themselves travel by private or public transport. This additional expense is a big drain on their income. Some fishes are often stolen on the way. Since most of the catches were carried to market without ice, the freshness of the fishes was lost on its way and such fishes fetch low price in the market. Hence, vehicle facilities, as in agriculture, could be provided for fisherwomen of all coastal villages which could solve this problem to considerable extent.

About 77.19 per cent respondents reported lack of employment during off-season as a major problem in participation in small-scale fisheries. Ahilan and Selvaraj (1990), Rao (1995) and Sheela (1997) also reported unemployment as a constraint of fisherwomen. During off-season the fishing activities are comparatively less in coastal villages and the fisherfolk are finding it difficult to run the family. Hence, they borrow money from professional money lenders with high rate of interest. When the fishing season starts, they are forced to sell their catches to money lenders compulsorily and that too at a low price for their catch. It is felt necessary that during lean and off-season, the government and non-governmental organisations could provide self-employment opportunities to the

fisherwomen. Loan facilities with subsidy through banks in starting small petty shop or the works of their interest during off-season could probably solve this problem to some extent.

Lack of good marketing facilities was perceived as a constraint by about 72.81 per cent of respondents. This is further supported by the findings of Nair and Kandoran (1992) and Sujathkumar (2000). Presently, the fisherwomen are selling their catches almost in the beach itself through individual auctioning. The price offered in beach side sale is very low when compared to fish market in the towns and cities. Further, they do not have facilities to take such catches to the nearby markets. Hence, it is imperative that good marketing facility must be created in each coastal village to get remunerative price for their catches for mitigating this constraint.

Lack of working capital was a problem to about 68.44 per cent of fisherwomen. Fish used to be traded mainly at the shore. The main problem of fisherwomen was uncertainty of income through sale of fish, as the customers always have the choice of not buying any fish on days when the price or quality is found unacceptable. However, fisherwomen obtain fish from the traders on credit and only had to be regular in making payments to the traders in order to get fish on credit.

But in most of the fishing villages fish is no longer given entirely on credit. Friends, relatives and private money lenders are the usual sources of credit, with varying rates of interest. Therefore, credit facilities could be provided through cooperative societies.

About 62.81 per cent of the respondents felt inadequate credit facilities and low savings as constraints in small-scale fisheries. This finding is also in agreement with the findings of Balasubramaniam and Kaul (1985), Vasanthakumar (1987) and

Venkataramanujam *et al.* (1987). Women need money for day-to-day expenditure. Although there are several special schemes with low rates of interest for economically weaker sections, these women are unable to avail loans from banks, as they have no assets of their own to use as collateral security.

Most of the fisherwomen expressed that banks provided loan only to agriculturists and not to small-scale fishing enterprises. Moreover, most of them do not know the procedure of availing it. The process of obtaining loan from banks for immediate requirements is very cumbersome. To mitigate this problem, the nationalised and cooperative banks may do well in providing loans to fisherwomen for small-scale activities. The cumbersome procedure for availing the same should be eliminated. Awareness must be created among the fisherwomen in getting financial assistance through governmental and non-governmental organisations.

Low price for catch was a problem to about 62.19 per cent of them. This finding gained support from the findings of Balasubramaniam and Kaul (1985), Vasanthakumar (1987) and Venkataramanujam *et al.* (1987) who reported low price as a problem for majority of the fisherfolk. Due to beach side sale, the rates offered for their catches was low when compared to local fish market rate. Further, the catches of fisherwomen comprise only small and medium size fish, shell fish, etc., and the rates offered for such stuff are low when compared to catches of mechanised and non-mechanised fishing boats. Hence, an organised society by fisherwomen themselves could solve this problem. In addition to this, the Fisherwomen Cooperative Societies could also procure fish from them at the reasonable rate.

High cost of ice was another problems to 55 per cent of the fisherwomen. Fish is a highly perishable commodity and the self-life period of fresh fish is only 6 hours and after that deterioration starts. Hence, fishes could be marketed immediately on the arrival from the sea. Since majority of the fishes are sold only in the markets, the catches need to be iced before sending them to the local and nearby markets. Even though some fishing villages have ice factories, the price for the ice bar is comparatively high because of increase in electricity charges. At present the cost of one ice block (50 Kg) costs Rs. 50 - 65/-. An organised society or agency by the government could be started in order to supply ice at lower cost. It would enable them to get good price.

About 48.13 per cent of fisherwomen reported high cost of raw materials and many of them were preparing fishery by-products like fish and prawn pickles, masmin, etc. At present the cost of 300 gm fish/prawn pickles is Rs. 50/-. Therefore, it needs good market promotion through available media so as to popularise these products among the public.

About 45.31 per cent of respondents perceived limitation of coastal fishery resources as a constraint. As fishery resource is a renewable one and a common property for all fisherfolk try to catch as much as possible. They never realise how much could be safely harvested each year. The fisheries resources in some areas of this region are depleted and this has led to the problem of over-capitalisation in fishing, unemployment, shortage of fish supplies, etc.

With the development of the fishing industries, many polluting industries have been established along the coastal line and they discharge waste from the production

line into the sea. Also some fisherfolk themselves are operating prohibited fishing gears and methods such as dynamite, electricity and poisons, etc. These practices are causing rapid depletion of many fisheries resources. Hence, it is necessary that suitable extension methods have to be employed with the help of fisheries extension workers or filed level functionaries to explain the conservation concepts to the fisherfolk and make them realise the need for conservation and management for sustainable benefits.

Unfavourable weather condition as a problem was felt by 31.86 of fisherwomen which made them to remain unemployed during this period. Sheela (1997) also reported this problem. Hence, provision could be made to provide alternative employment during such periods. Net mending, basket, coir rope making, etc., are some of the alternative employment sources, that could be provided to them through interested non-governmental agencies / voluntary agencies.

Time allocation for small-scale fisheries was considered to be a problem for about 30.31 per cent of the respondents. If fisherwomen decide to spend more time in fisheries related activities, they cannot attend household chores. Hence, the fisherwomen find it very difficult in allocating time for fishery related activities. The flexible hours of work in fisheries related activities could be projected to facilitate fisherwomen to take up fisheries related activities.

Lack of training facilities was also a problem for about 25.00 per cent of the fisherwomen. Nair and Kandoran (1992) reported inadequate training facility as a constraint. The State Department of Fisheries and Fisheries College and Research Institute often conduct training programmes in their respective campuses. The fisherwomen find it difficult

to participate in such training programmes since these organisations are far away from their native villages. Hence, training programmes could be organised in the villages itself so that the fisherwomen could able to allot reasonable time to attend such programmes without disturbing their routine work in the home.

The lack of technical know-how was another problem to 19.06 per cent of the respondent. This is in line with that of Venkataramanujam *et al.* (1987). The recent development in fishing and fish processing methods are readily available to transfer to the ultimate user, the fisherfolk. Through the use of extension methods like individual, group and mass contact programmes, such technical know-how could be effectively disseminated.

Availability of lack of fisheries publications was perceived as a problem by 12.81 per cent of the fisherwomen. At present, the fisheries publications in local language are very limited. Therefore, publications in local and easily understandable language could be made available to the fisherwomen.

4. 5. 2. Other constraints

Liquor addiction by male members was considered as a severe problem by about 89.06 per cent of respondents. Similar findings were reported by Ahilan and Selvaraj (1990), Ahilan *et al.* (1996) and Sujathkumar (2000). This always hampers the fisherwomen day-to-day work. Liquor addiction by spouse causes many problems in every fisherwomen family and even in some fisherfolk families, women are beaten by their spouse and spouses spending lavishly most of the earnings on this.

Varmabally (1988) reported that fishermen by temperament did not save money for lean season and usually they spent all they earn. Considerable part of their income goes for gambling and drinking purposes. Therefore, the fisherwomen have to participate in the income earning activities besides household chores. It calls for the attention of the government to ban the liquor shops which are functioning in the coastal regions. Proper extension programmes could be launched to educate the fisherfolk to create awareness on the consequences of liquor addiction.

About 67.19 per cent of respondents expressed inadequate drinking water as a problem. Ahilan and Selvaraj (1990) also reported this as a constraint. The fisherwomen get drinking water on alternate days or once in two to three days and that too not sufficient for their day-to-day activities. It calls for the attention of the agencies that provide water supply for the coastal villages. Since the ground water in the coastal regions is mostly salty, an agency may be created in order to provide drinking water during the drought season. This could solve this problem to some extent.

About 61.50 per cent of the fisherwomen reported poor sanitation as a constraint as this could spread many diseases. Therefore, adequate facilities in each fishing village need to be provided.

Higher cost of education was considered as a problem by 52.19 per cent of the respondents. Since the government schools in fishing villages are very limited, the fisherwomen are forced to send their children to private schools to nearby towns and cities where the educational fees are very high. This calls for the attention of government in establishing schools in coastal villages.

Dowry was another problem to 31.56 per cent of respondents. Ahilan and Selvaraj (1990) also reported dowry problem in most of the fisherwomen families. Through proper educational programmes this problem could be eliminated to some extent.

Lack of communication facilities was identified as a constraint by 17.50 per cent of the fisherwomen. Communication with their spouses while catching fish in sea is not possible at present. This facility must be created in every fishing village or alternative villages so that the fisherwomen could get in touch with their spouses. This type of work may be entrusted with the cooperative societies or voluntary agencies.

About 15.31 per cent of them felt physical strain as a constraint. Bhaumik *et al.* (1990) and Sheela (1997) were also reported physical strain as a major problem for fisherwomen. This could be eliminated by allocating time for fisheries related activities.

4. 6. Training strategies for fisherwomen

Major subject areas of training and specific items under each major area were selected based on the opinion of the experts in fisheries.

Table 37 reveals that the fisherwomen preferred training in the preparation of fish/prawn pickles followed by hygienic handling of fish and fishery products, preparation of masmin, dry fish, fish meal, preparation of chank ornaments, preparation of shark liver oil, fish wafers, fish soup powder and seaweed culture. The less preferred aspects were given to preparation of shark fins rays, agar agar, chitosan and mussel culture.

The possible reason for such ranking might be that the most of the fishery products are popular in local and national markets which fetch additional income to their families and these could be prepared and sold them in the local markets or through house-to-house sale.

A close study of the Table 37 reveals that out of 14 major areas identified, only 10 areas were preferred as most important training areas by the fisherwomen and the remaining 4 areas were considered as less important. The overall mean score of the major subject areas was taken as the basis to categorise the areas as most and less important. The major areas which were considered less important by the fisherwomen were not included in the training strategy.

Table 37. Order of preference of training by fisherwomen

No.	Major area	Mean score	Rank
1	Preparation of fish/prawn pickle	2.81	I
2	Hygienic handling of fish and fishery products	2.76	II
3	Preparation of masmin	2.51	III
4	Preparation of dry fish	2.47	IV
5	Preparation of fish meal	2.42	V
6	Preparation of chank ornaments	2.37	VI
7	Preparation of shark liver oil	2.34	VII
8	Preparation of fish wafers	2.29	VIII
9	Preparation of fish soup powder	2.25	IX
10	Seaweed culture	2.24	X
11	Preparation of shark fins rays	1.87	XI
12	Preparation of Agar Agar	1.71	XII
13	Preparation of chitosan	1.62	XIII
14	Mussel culture	1.51	XIV
	Overall mean score	**2.23**	

4. 6. 1. Preference of training in specific items under major areas

Each major area includes four or five specific sub-areas. Having identified the major areas, an attempted was made to identify the specific sub-areas under each major areas in which fisherwomen required training.

An assessment was made to point out the most and least important areas for developing suitable training strategies taking the overall mean score of the specific area as the basis. A specific area having its mean score value greater or less than the overall mean score was considered as more and less important respectively.

4. 6. 1. 2. Preparation of fish/prawn pickles

Fish and prawn pickle are very tasty and nutritious to the human beings since fishes possess 17 per cent protein and is easy to digest than the other items like mutton, beef, chicken, etc. The major area of preparation of fish and prawn pickles had five sub-areas viz., selection of fishes, adding ingredients, cooking time, bottling and labelling and marketing. The training preferred by the fisherwomen in this aspect was assessed and presented in the Table 38.

Table 38. Training preferred on the preparation of fish / prawn pickles

No.	Sub-areas	Mean score	Rank
1	Selection of fishes / prawns	2.47	I
2	Adding ingredients	2.31	II
3	Cooking time	2.16	III
4	Bottling and labelling	1.89	IV
5	Marketing	1.78	V
	Overall mean score	**2.12**	

The Table 38 reveals that out of five sub-areas, the fisherwomen preferred training in the selection of fishes / prawn, adding of ingredients and cooking time as the mean scores were more than the overall mean score (2.12). Selection of fishes/prawns received the first rank followed by adding ingredients and cooking time earned second and third ranks respectively. The least preferred areas were bottling and labelling and marketing.

It may be concluded that the bottling and labelling and marketing could be done by the fisherwomen themselves since, these requires comparatively less training. The other three aspects were considered as most important since, it needs training in proper

preparation so that it would fetch more price in the market. This finding is in line with the findings of Veeraputhiran (1988).

4. 6. 1. 3. Hygienic handling of fish and fishery products

Hygienic handling of fish and fishery products is very important to reduce the spoilage time of the fish and fishery products and for fetching higher price in the markets. There are five sub-areas in this major area. The training preferred is presented in Table 39.

Table 39. Training preferred on hygienic handling of fish and fishery products

No.	Sub-areas	Mean score	Rank
1	Icing of fishes	2.22	I
2	Use of chlorinated water	2.12	II
3	Insulated ice box for transport	2.00	III
5	Sanitation techniques	1.70	IV
4	Cleaning of vessels, etc	1.56	V
	Overall mean score	**1.92**	

The Table 39 indicates that out of five sub-areas under this major area, fisherwomen preferred training in icing of fishes, use of chlorinated water, and insulated ice box for transport as their mean scores were more than overall mean score value (1.92).

Fisherwomen gave first preference to icing of fishes while use of chlorinated water and insulated ice box for transport earned second and third ranks respectively. The least preferred areas were sanitation techniques and cleaning of vessels, etc. Since sanitation techniques and cleaning of vessels, etc., requires no special training, they were considered as less important as by the respondents.

4. 6. 1. 4. Preparation of masmin

Preparation of masmin is also considered as important fishery by-product. The training preferred by the fisherwomen under this major area was assessed and presented in the Table 40.

Table 40. Training preferred on the preparation of masmin

No.	Sub-areas	Mean score	Rank
1	Processing in salt	2.41	I
2	Smoking time	2.32	II
3	Selection of soorai meen	2.22	III
4	Packing and marketing	1.98	IV
5	Temperature	1.75	V
	Overall mean score	**2.14**	

Among the five sub-areas, processing of salt, smoking time, selection soorai meen were appeared as most important areas for training. The less important were temperature and packing and marketing as these would not require much training.

4. 6. 1. 5. Preparation of dry fish

Drying of fish has been a traditional process of fish preservation in most of the countries. Drying removes moisture and paves an unfavourable climate for the bacteria to thrive. From the nutritional point of view, the sun-dried products have an advantage since there is no loss of nutrients. The training preferred was assessed and presented in Table 41.

Table 41. Training preferred on the preparation of dry fish

No.	Sub-areas	Mean score	Rank
1	Fish - salt ratio	2.45	I
2	Physical condition for drying	2.34	II
3	Time of salt penetration	2.26	III
4	Selection of fishes for drying	1.79	IV
5	Salt size	1.67	V
	Overall mean score	**2.10**	

This major area covered five sub-areas (Table 41). The fisherwomen preferred much training in fish -salt ratio, physical condition for drying and time of salt penetration as mean scores of these five sub-areas were more than the overall mean score (2.10). The salt size and selection fishes for drying were least preferred for training as these could be seen from the mean score value.

4. 6. 1. 6. Preparation of fish meal

Fish meal being low cost feed supplement with intrinsic nutritional value, is always in great demand. Fish meal is mainly prepared from non-edible and miscellaneous varieties of trash fishes and fish wastes. The production involves stages like fish meal cooking, processing, grinding, drying, etc. The relative importance as postulated by the fisherwomen in this area was assessed and presented in the Table 42.

Out of five specific sub-areas under the preparation of fish meal, the fisherwomen preferred training in processing and drying, meal cooking and grinding. Processing and drying received the first rank followed by duration of meal cooking and grinding which earned second and third ranks respectively. Selection of fishes and

marketing of fish meal were considered as less important. Processing and drying, meal cooking and fish meal grinding were the most preferred training as it requires skill on the part of the fisherwomen

Table 42. Training preferred on the preparation of fish meal

No.	Sub-areas	Mean score	Rank
1	Duration processing and drying	2.33	I
2	Duration of meal cooking	2.27	II
3	Grinding	2.15	III
4	Selection of fishes	2.00	IV
5	Marketing	1.98	V
	Overall mean score	**2.15**	

4. 6. 1. 7. Preparation of marine shell crafts

Like other ornaments, the marine shell crafts nowadays are becoming more popular all over the world. It is being used for decorating the house. Because of this, the demand for such shell crafts is increasing rapidly especially for bangles from chanks, models from sea shells, etc. The preference of training under this major area is presented in the Table 43.

Table 43. Training preferred on the preparation marine shell crafts

No.	Sub-areas	Mean score	Rank
1	Type of ornaments	2.44	I
2	Adding colours	2.35	II
3	Use of chemicals	2.29	III
4	Type of sea shells required	2.20	IV
5	Marketing	1.78	V
	Overall mean score	**2.21**	

The important areas preferred by the fisherwomen were types of ornaments prepared, adding colours, and use of chemicals as the mean scores value were greater than the overall mean score value of 2.21. Types of sea shells and marketing were the least preferred training sub-areas.

It could be concluded that types of shell crafts, adding of colours to the ornaments and use of chemical for bleaching the shells requires high knowledge as the knowledge on the use of these things would increase the price of marine shell crafts in the local and national markets.

4. 6. 1. 8. Preparation of shark liver oil

Considering the importance of shark liver oil in many pharmaceutical and leather industries, the training preferred and it was assessed and presented in the Table 44.

Table 44. Training preferred on the preparation of shark liver oil

No.	Sub-areas	Mean score	Rank
1	Separation of oil	2.33	I
2	Separation of liver	2.27	II
3	Selection of shark species	2.20	III
4	Preservation	2.00	IV
	Overall mean score	**2.20**	

The Table 44 reveals that out of four specific areas under the preparation of shark liver oil, fisherwomen expressed their preferences in separation of oil, separation of liver and selection of shark species for training. The preservation of oil was considered as less important as the its mean score (2.00) value fall below the overall mean score value.

The items separation of oil received the first rank whereas separation of liver and selection of shark species earned second and third ranks respectively. Separation of oil, liver and selection of shark species for extraction of oil were preferred by the fisherwomen for training because it requires adequate knowledge and skill in the preparation of liver oil.

4. 6. 1. 9. Preparation of fish wafers

Fish wafer is one of the value added fishery products. It involves less cost and is easy to prepare. The training preferred under this major area is presented in the Table 45.

Table 45. Training preferred on the preparation fish wafers

No.	Sub-areas	Mean score	Rank
1	Adding of ingredients	2.35	I
2	Cooking time	2.21	II
3	Adding of preservatives	2.11	III
4	Selection of quality fishes	1.99	IV
5	Packing and marketing	1.54	V
	Overall mean score	**2.04**	

The Table 45 indicates that the fisherwomen considered adding of ingredients, cooking time and adding of preservatives as most important training areas as the mean scores value were greater than the overall mean score (2.04). Selections of quality fishes, packing and marketing were least preferred by the respondents. Adding of ingredients received the first rank while cooking time and adding preservatives earned second and third ranks respectively.

4. 6. 1. 10. Preparation of fish soup powder

Fish soup powder is also one of the post-harvest technologies like the preparation of fish and prawn pickles. The soup powder could be mixed with milk powder and used for any soup preparations.

An analyse of the Table 46 shows that out of five sub-areas, only two areas were considered as most important by the fisherwomen and the other sub-areas were considered less important. The fisherwomen preferred training only in soup powder fineness and grinding as it decides its quality / grade and hence the fisherwomen requires more exposure in the above two specific areas.

Table 46. Training preferred on the preparation of fish soup powder

No.	Sub-areas	Mean score	Rank
1	Soup powder fineness	2.44	I
2	Grinding	2.35	II
3	Adding of ingredients	1.99	III
4	Selection of fishes	1.87	IV
5	Marketing	1.78	V
	Overall mean score	**2.09**	

4. 6. 1. 11. Seaweed culture

Seaweeds are popular in the preparation of Agar Agar which is used in pharmaceutical and cosmetic applications. The training preferred under this area is presented in the Table 47.

Table 47. Training preferred on seaweed culture

No.	Sub-areas	Mean score	Rank
1	Culture methods	2.39	I
2	Collection techniques	2.28	II
3	Selection of cultivable species	2.21	III
4	Harvesting	1.77	IV
5	Marketing	1.59	V
	Overall mean score	**2.05**	

It could be seen from the Table 47 that out of five sub-areas under this major area, three sub-areas were considered as most important and two were considered as less important. The respondents preferred training in culture methods followed by collection technique and selection of cultivable.

4. 6. 2. Certain aspects of training programme

After locating the major and sub-areas in which training is needed, an attempt was made to find out the preference of type, training method, season, duration and size of training group for developing a training strategy. Before organising and conducting any training programme for fisherwomen these factors have to be taken into consideration to ensure active participation by the fisherwomen. These factors have been discussed and presented below.

4. 6. 2. 1. Type of training preferred

The study covered three types of training viz., institutional training (on-campus), peripatetic training (off-campus) and Farm School on AIR. The fisherwomen's responses were analysed and presented in the Table 48.

Table 48. Type of training preferred

No.	Type of training	No.	Percentage	Rank
1	Peripatetic training (off-campus training)	218	68.13	I
2	Institutional training (on-campus training)	80	25.00	II
3	Farm school on All India Radio	22	6.87	III
		320	**100.00**	

From the Table 48, it is very clear that the fisherwomen gave top most priority for peripatetic training (68.13 per cent) followed by institutional training (25.00 per cent) and farm school on All India Radio (6.87). This is in accordance with the findings of Veeraputhiran (1988) and Ahilan (1999) who had also reported that most the fisherwomen preferred to undergo off-campus training programmes.

The possible reason behind this is that it is being offered under actual field situation and it enables the fisherwomen to participate better in the training programmes without any hindrance to their routine work. Further, this type of training enables the fisherwomen to express their ideas freely. In case of farm school on AIR, the fisherwomen could not raise their doubts immediately since, there would not be any reciprocal communication.

4. 6. 2. 2. Method of training

Effective communication and acquisition of knowledge about the latest fisheries technologies in a training programme mostly depends on the training methods employed. In the selection of training methods, the view of the fisherwomen if ascertained,

it would be most useful to the trainers for employing such methods in training programmes. The study covered two types of training methods viz., single and combination of methods.

The respondents were asked to indicate their choice regarding the methods of training preferred. The results are presented in the Table 49 and 50.

Table 49. Single method of training preferred by fisherwomen

No.	Methods of training	No.	Percentage	Rank
1	Demonstration	200	62.50	I
2	Group discussion	79	24.69	II
3	Field trips and study tour	23	7.18	III
4	Lecture	18	5.63	IV
		320	**100.00**	

The Table 49 reveals that out of four methods listed demonstration was preferred by 62.50 per cent of the respondents followed by group discussion (24.69 per cent), filed trips and study tour (7.18 per cent) and lecture (5.63 per cent) respectively. This finding in is agreement with the finding of Veeraputhiran (1988) , Kiron (1992) and Ahilan (1999) who reported that demonstration and group discussion were the most important methods for training the fisherwomen.

While demonstration permits the fisherwomen to see, hear and do the thing to be learned, discussion permits face-to-face exchange of ideas between trainers and co-trainees. The field visit and study tour provides greater opportunity for fisherwomen to observe and study many post-harvest technologies in their actual situation.

The above findings suggest that demonstration and group discussion are the most important methods to be adopted in fisheries training programmes.

Table 50. Combination of methods of training preferred by fisherwomen

No.	Combination of training methods	No.	Percentage	Rank
1	Lecture cum demonstration	247	77.19	I
2	Discussion cum demonstration	56	17.50	II
3	Lecture cum discussion cum field trips	17	5.31	III
		320	**100.00**	

Lecture cum demonstration was preferred by almost three-fourth of the fisherwomen followed by discussion cum demonstration (17.50 per cent) and lecture cum discussion cum field trips (5.31 per cent). This finding is in accordance with the findings of Kiron (1992).

The results of this study reveals that combination of methods 1 and 2 could be used for providing training to the fisherwomen as many post-harvest technologies requires knowledge and skill to do many of the small-scale fisheries activities.

4. 6. 2. 3. Season of training preferred

Many a time fisherwomen fail to participate in the training programmes because it was organised during busy seasons. Hence, it is imperative to find out the appropriate season during which fisherwomen would like to undergo training. The fisherwomen were asked to indicate the suitable period for undergoing training. The response of the fisherwomen has been presented in the Table 51.

Table 51. **Season of training preferred**

No.	Seasons	No.	Percentage	Rank
1	During slack season	221	69.06	I
2	Whenever required	73	22.81	II
3	All seasons	26	8.13	III
		320	**100.00**	

The Table 51 shows that about 70 per cent of the fisherwomen would like to under go training during slack seasons followed by whenever required (22.81 per cent) and at all seasons (8.13 per cent). From the above finding it is evident that the fisherwomen would like to undergo training during lean seasons (January to March and June to August) as there was not much fisheries activities to do. Hence, the training programmes tailored for the benefit of fisherwomen could be organised and conducted only during slack seasons to ensure greater participation. This finding is in line with the findings of Veeraputhiran (1988), Kiron (1992) and Ahilan (1999).

4. 6. 2. 4. Duration of training preferred

The duration of the training programme is also an important factor as any other component of training. Hence, the optimum number of days for the training needs to be decided in advance. The respondent was asked to indicate their choice regarding the number of days of training. The Table 52 reveals that more than half of the fisherwomen preferred training for the duration of 5-10 days. About one-fourth of the respondents preferred the duration of 11- 15 days followed by 16-20 days (5.94 per cent), 21-25 days (4.06 per cent) and over 25 days (2.19 per cent).

Table 52. Duration of training preferred

No.	Duration of training	No.	Percentage	Rank
1	5 to 10 days	199	62.19	I
2	11 to 15 days	82	25.62	II
3	16- 20 days	19	5.94	III
4	21 - 25 days	13	4.06	IV
5	Above 25 days	7	2.19	V
		320	**100.00**	

The results suggest that training programmes can be conducted for a duration of 5-10 days to get maximum participation by the fisherwomen. This finding is supported by the findings of Veeraputhiran (1988) and Kiron (1992).

4. 6. 2. 5. Size of training group

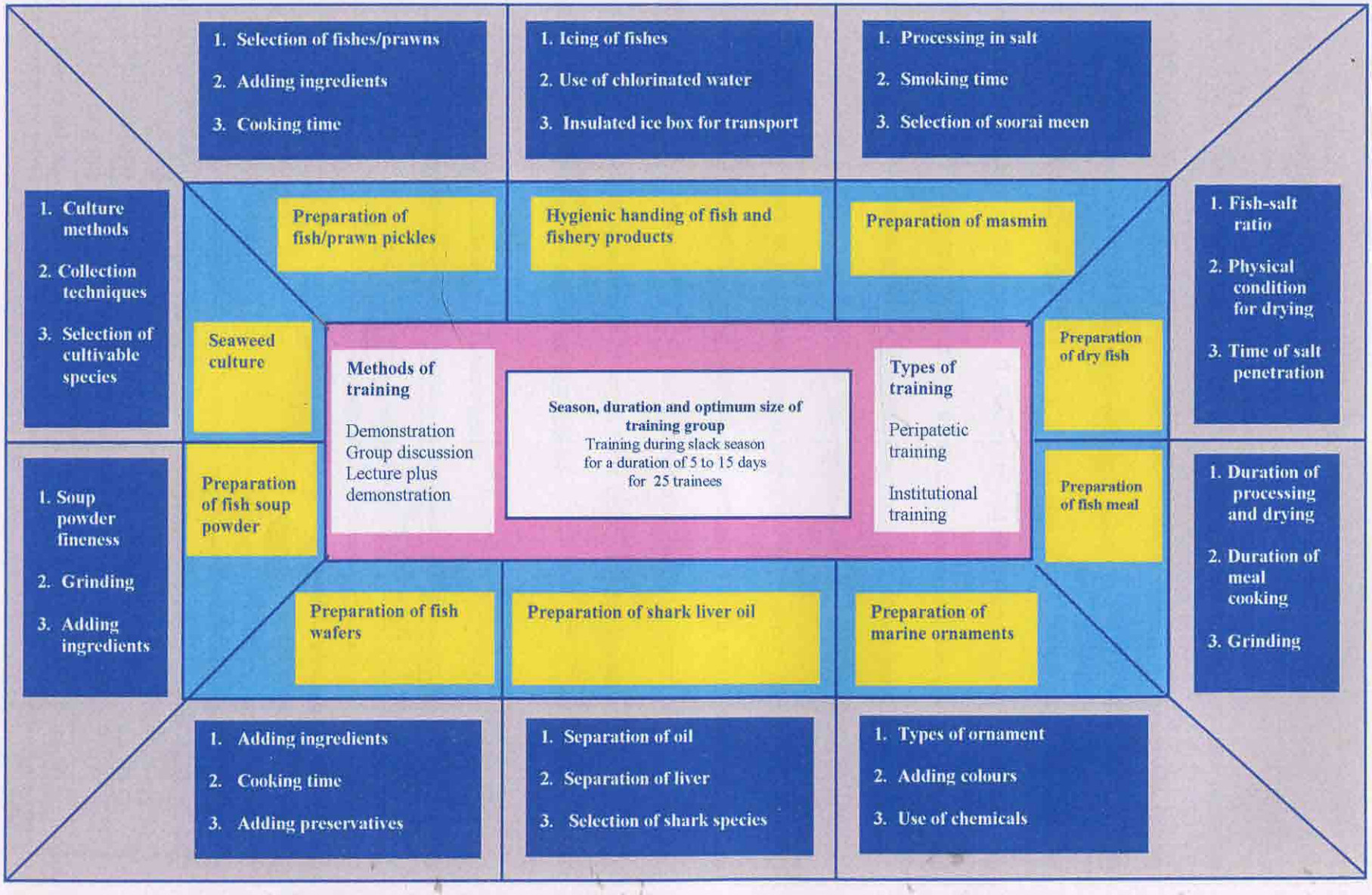
The size of the training group plays an important role in determining the success of the training programmes. The fisherwomen were asked to indicate their choice regarding the number of trainees in each training programme (Table 53).

Table 53. Size of training group preferred

No.	Size of training group	No.	Percentage	Rank
1	Upto 15 fisherwomen	162	50.63	I
2	16 - 25 fisherwomen	140	43.75	II
3	26-35 fisherwomen	18	5.62	III
4	35-40 fisherwomen	--	--	
5	Above 50 fisherwomen	--	--	
		320	**100.00**	

The optimum size of training group preferred by the fisherwomen was up to 25 numbers as is evident from the Table 53. This finding is also in line with the findings of Veeraputhiran (1988). The reason could be that if the number of trainees is below 25, individual attention could be paid for imparting effective training.

Figure 9 shows the training strategies for fisherwomen engaged in small-scale fisheries.



= Major areas = Sub areas (specific items) under major areas

Fig - 9

4. 7. Prospects available for fisherwomen

A mailed questionnaire was developed in order to study the prospects available for fisherwomen engaged in small-scale fisheries. About 25 items covering various prospects available for fisherwomen were collected based on the available literature and with the personal discussion had with the scientists and officials working in the fisheries development organisations (Appendix -II, Annexure - 4) and it was sent to 75 scientists and officials. They were requested to scrutinise these areas by noting along any of the points namely, most possible, more possible, possible, less possible and not possible and the score assigned were 5, 4, 3, 2 and 1 respectively. The replies were received only from 50 of them. The areas were arranged in descending order based on total score. Mean and standard deviation of the score obtained were worked out and areas with score above the mean (17.94) plus standard deviation (7.29) were selected. Thus, 10 areas of prospects for fisherwomen engaged in small-scale fisheries were selected and discussed. The prospects available for fisherwomen are presented in Table 54.

Table 54. Prospects available for fisherwomen

No.	Prospects	No. reported	Percentage
1	Preparation of fishery products	50	100.00
2	Fish marketing	47	94.00
3	Fabrication of fishing gear and baskets	41	82.00
4	Opportunities in coastal aquaculture	36	72.00
5	Opportunities in fisheries training	35	70.00
6	Prospects in ornamental fish culture	34	68.00
7	Establishment of small fisheries enterprises	31	62.00
8	Self employment opportunities	29	58.00
9	Preparing marine shell crafts	25	50.00
10	Organisation of self-help groups	13	26.00

4. 7. 1. Preparation of fishery products

With increased catch of marine fish and production of fish through aquaculture, it becomes necessary to prepare ready-to-use fishery products in order to protect the interests of the primary producer as well as to cater to the requirements of the urban consumers. The rapid pace of urbanisation is also likely to increase the demand for frozen fillets over the years, especially among upper and middle income groups. Similarly, preparations of fish and prawn pickles, fish wafers, masmin, fish soup powder, etc., should find a ready market in urban areas. The Table 54 revels that cent prospect available to fisherwomen in the preparation of fishery products like fish and prawn pickles, masmin, fish wafers, fish soup powder, etc. Hence, the fisherwomen could be suitably trained and employed in the preparation of such products in the market in value added form, so as to increase the net returns.

4. 7. 2. Fish Marketing

In India, the retail markets of marine fish has traditionally been done by women, which could be further increased with greater industrialisation, more number of cold storage and refrigerated outlet facilities for fish and fishery products. Since women are better suited for retail marketing of fish, they should be encouraged to manage such outlets with suitable facilities such as loans for investment and working capital at low interest rates. As seen from the Table 54, about 94 per cent of the scientists and officials reported good prospects available for fisherwomen in marketing of fish and fishery products.

4. 7. 3. Fabrication of fishing gear and baskets

About 82 per cent of the scientists and officials reported that fabrication of fishing gear and baskets is one of the prospects available to fisherwomen. Manufacture of fishing nets, fish traps and baskets for fresh fish transportation can be taken up by fisherwomen as a cottage industry. A study conducted by Radheyshyam *et al.* (1988) in Orissa showed that, once trained, women could earn more from net fabrication than from agriculture labour. Women would also definitely benefit from the manufacture of large baskets for packing fresh fish with ice, as they are in great demand in all important fish production centres.

4. 7. 4. Opportunities in coastal aquaculture

The success seen in coastal aquaculture in countries like China, Japan, Thailand and Philippines, is in no small measure due to the contribution by women at different levels of operation. Women have the same status as men in these countries and play an equally important role in developing and managing their coastal aquaculture. The high literacy rate and comparatively liberal value systems in these countries have given their women greater opportunities for a participatory role in coastal aquaculture (Baluyut, 1987).

If the present levels of employment of women in coastal aquaculture in India have to change, especially in a general situation of rising unemployment and acute competition for every available job, it may be necessary to look for specific opportunities which require technical skills in greater measure, where women would be equal to or possibly superior to men, given the same level of education and training.

Such opportunities should also enable them to integrate economic activities with domestic responsibilities. Some of the avenues in which women could be participated are shellfish seed collection - sorting and packing for transportation, culture of seaweeds and mussel in estuarine areas using simple techniques of seeding and transplantation and post harvest treatment requiring comparatively less skills. About 72 per cent of scientists and officials reported the improvement of economic conditions of fisherwomen families through coastal aquaculture activities.

4. 7. 5. Opportunities in fisheries training

The earlier studies on fisherwomen indicate that they have been neglected in the past. In most developmental efforts, the focus is on technology for men. Women and families indirectly benefit from such schemes but their status and role in the community have remained unchanged. However, there is lot of opportunities and scope for fisherwomen to undergo training and raising their incomes by introducing technological improvements in fisheries, especially in small-scale fisheries.

The preparation of value added fishery products such as fish and prawn pickles, fish soup powder, fish wafers, masmin, dried fish, etc., will provide additional income to the fisherwomen families. About 70 per cent of the officials reported that good training opportunities are available for fisherwomen through fisheries development organisations like Fisheries College and Research Institute, Department of Fisheries, Non-Governmental Organisations, etc. There is lot of scope for improving or upgrading the skill of fisherwomen through training programmes.

4. 7. 6. Prospects in ornamental fish culture

Mohsnty and Jena (1996) found that the fish farming by women influence even the other non-farming communities as a dependable source of self employment and high income without affecting their day-to-day domestic and vocational chores. The private kitchen ponds provide a scope for steady income through successional aquaculture activities that includes, fry and fingerlings rearing and raising table size fish. About 68 per cent of the officials reported this prospect. If the fisherwomen are trained and motivated to take up ornamental fish culture in their home back yard with the help of small cement tanks and it would provide an alternative source of income for them as there is great demand for ornamental fishes in towns and cities.

4. 7. 7. Establishment of small fisheries enterprises

Establishment of fisheries enterprises like sales centre for value added fishery products, net sales and repairing centre, etc., could also be undertaken by the fisherwomen as small-scale units in their own village itself. About 62 per cent of the scientists and officials indicated that the fisherwomen could establish small fisheries enterprises which would provide additional income to their families. These activities should be supported through Fisherwomen Cooperative Societies. Materials required for running their enterprises may be supplied at reasonable rate by the cooperative societies. Nair and Kandoran (1992) also reported that many of the trained women formed their own societies in various parts of Kerala State for selling the value added fishery products like fish wafers, fish pickles, fish cutlets and dried fish, etc.

4. 7. 8. Self employment opportunities

Since most of the fisherwomen were unemployed and have no alternative employment during off-season, starting of small-scale fisheries enterprises could provide self employment opportunities. Sale of fishery products, fishing gear accessories, nylon rope, fish baskets, etc., could be undertaken by individual or by collaboration with other fisherwomen through cooperative venture. The menfolk of the family could also give moral support to their women. About 58 per cent of the officials provided their suggestion on this opportunity.

4. 7. 9. Preparation of marine shell crafts

It could be seen from the Table 54 that 50 per cent of the scientists and officials reported that one of the good prospect available for fisherwomen is the preparation of marine shell crafts There is a vast scope for the preparation of crafts from sea shells, sea fans, etc. The demand for such marine ornaments is increasing day-by-day. They are used to decorate the house and star hotels. If the fisherwomen are trained in the preparation of such ornaments, especially in the processing (bleaching) and colouring, it would provide an alternative source of income to them.

4. 7. 10. Organisation of self-help groups

About 26 per cent of them indicated that one of the prospects available for fisherwomen is formation of self-help groups. Formation of self-help group by fisherwomen themselves could solve many of the constraints in the participation of small-scale fisheries. This would also eliminate the problems of middlemen and professional money lenders. They

could make this group to generate funds from various sources (banks, voluntary organisations, church group, etc.) for its members and these funds could be distributed to the members with low rate of interest. This group could be properly motivated to involve in the activities of the fisheries development organisations to avail various schemes / programmes of these organisations.

SUMMARY AND CONCLUSION

CHAPTER - V

SUMMARY AND CONCLUSIONS

Women since time immemorial have formed as organic component of the working force. They do many works in addition to their normal domestic chores as a housewife. Thus, women play a dual role in the society. In spite of this, women still remain pitiful due to non-recognition of their work in economic development though they play considerably equal role in economic development. The declaration of women's decade (1975-1985) by the United Nations has influenced nations everywhere to integrate women in the national development process. Women represent a unique resources and expertise available for the construction of new social formation, new approaches to human productivity and welfare.

The involvement of women in fisheries sectors in India in earlier times was largely restricted to the household and their participation in other activities was practically non-existent. This was mainly due to ignorance of fisherfolk and a misconception about the skills of women and about men's superiority. This is aptly reflected by the commonly used expression of *weaker sex* while referring to women. In spite of impressive technological and sociological progress the country has witnessed during the present century, women are yet to participate in various activities on footing with men.

It is well known that in the recent years women have always been involved in fisheries and it was largely restricted to retail sale of fish and simple indigenous methods of fish processing. The emergence of modern fish processing industries provides a new avenue

of employment to innumerable women. With the growth of women's education in the country in the recent decades, women have started entering almost all occupations, including fisheries, such as research, development, training, extension and industry and have already their presence felt. However, even though the integration of women in small-scale fisheries is already on the move, there is still scope for further growth. Therefore, the present study, Women in small-scale fisheries: Their status, problems and prospects was undertaken with the following objectives:

i) to study the profile of women engaged in small - scale fisheries

ii) to study their awareness, knowledge and extent of participation in small-scale fisheries and fisheries development organisations

iii) to study the relationship between the characteristics of the respondents and their extent of participation in small-scale fisheries and in the activities of fisheries development organisations

iv) to identify the constraints faced by the respondents in small - scale fisheries

v) To develop a training strategy for women engaged in small-scale fisheries

vi) to explore the possibilities of achieving better status for women in small - scale fisheries

The southern coastal districts of Ramanathapuran, Thoothukkudi, Tirunelveli and Kanyakumari were selected for the study. In each district, two coastal taluks were selected and from each taluk two fishing villages were selected based on the maximum population of fisherwomen. Thus, a total of 14 fishing villages selected covering the four coastal districts and from these fishing villages a total of 320 fisherwomen were randomly selected proportionate to its size. The data were collected through a well-structured interview schedule with personal inquiry with the fisherwomen. The collected data were analysed with necessary statistical tools. The salient findings of the study are given below.

5. 1. Profile of women engaged in small-scale fisheries

1. Most of the fisherwomen were belonged to young age group (50.31 per cent). The respondents who had middle and old age were 28.13 and 21.56 per cent respectively.

2. About one-third of the fisherwomen were illiterate (30.96 per cent) and functionally literate (31.31 per cent). The fisherwomen who had primary, middle, secondary school and collegiate levels education put together were found to be about 38.73 per cent.

3. There was not much difference noticed among the fisherwomen in social participation.

4. About 72.00 per cent of the fisherwomen had medium level of communication status.

5. As far as socio-economic status is concerned about 53.13 per cent of respondents had medium level of socio-economic status while 28.12 and 18.75 per cent had low and high socio-economic status respectively.

6. About 50.31 and 49.69 per cent of the respondents had labour force of upto 5 and above 5 respectively.

7. About 57.50 per cent fisherwomen had 10-15 years of experience in small-scale fisheries followed by above 15 years (21.56 per cent) and below ten years (20.94 per cent) of experience.

8. The average annual income of the fisherwomen family was about Rs. 19,151/-. The major source of income was from fishing related activities.

9. The annual average expenditure was about Rs.16,220/- . From this, about 36.98 per cent of the income was spent for food and about 25.35 per cent was spent on fishing related activities.

10. As far as information source exposure was concerned radio (63.75 per cent), training programmes (29.06 per cent) and television programmes (21.56 per cent) were utilised by the fisherwomen.

11. About 46.88 per cent of the fisherwomen had low level of extension system linkage followed by medium (31.26 per cent) and high (21.86 per cent) levels of linkage.

12. About 25.31 per cent, 53.13 per cent and 21.56 per cent of them had low, medium and high levels of risk orientation respectively.

13. As far as economic motivation is concerned, about 59.06 per cent of them had medium level of economic motivation. The women who had high and low economic motivation were about 27.19 per cent and 13.75 per cent respectively.

14. About 15.94, 53.13 and 30.93 per cent of fisherwomen had low, medium and high scientific orientation respectively.

15. About 37. 81 per cent of the fisherwomen had made individual decisions in fish marketing, beach side fishing / sale and fish cleaning in the market. The spouse had made decision in only fish transportation to the nearby or local markets. About 18.13 per cent of them had made joint decisions on borrowing/lending money.

Collective decisions on the purchase of fishing assets were made by 30.31 per cent of them.

16. About 92.53 per cent of the fisherwomen in one way or other received cooperation from their spouse in fisheries activities.

5. 2. Awareness and knowledge level

1. About 59.04 per cent of the respondents were well aware of small-scale fisheries occupations. About 12.32, 6.63 and 22.01 per cent of the respondents had aware, somewhat aware and not aware levels respectively. Whereas about 66.52 per cent of the fisherwomen were well aware of the activities of fisheries development organisations. About 23.44 per cent of them were aware and about 10.04 per cent of them were somewhat aware of the activities of fisheries development organisations. All the respondents in one way or other familiar with the selected activities of fisheries development organisations. The variables educational status, social participation status, socio-economic status, annual income, information source exposure, extension system linkage, risk orientation, economic motivation scientific orientation and spouse cooperation contributed significantly and positively while the other variables exhibited non-significant influence on the awareness level.

2. The respondents who had low, medium and high level of knowledge on small-scale fisheries and the activities of fisheries development organisations were about 12.19, 67.19 and 20.62 per cent respectively. The variables, educational status, social participation status, socio-economic status, annual income, information

source exposure, extension system linkage, risk orientation, scientific orientation, decision making pattern and spouse cooperation contributed significantly and positively whereas the age and size of labour force had negative relationship with the knowledge level. The variable economic motivation exhibited non-significant influence on the knowledge level.

5. 3. Extent of participation

1. Of the 34 small-scale fisheries activities selected, the fisherwomen did not participate in the activities like seaweed culture, mussel culture, preparation of chitosan, agar agar and shark fin rays. About 37.50 per cent of the women had participated in small-scale fisheries activities by themselves whereas only 5.94 and 9.37 per cent of the women had participated under supervision or guidance and in collaboration with other co-workers respectively. Therefore, about 52.81 per cent of the women had participated in the selected small-scale fisheries activities while 47.19 per cent of them did not participate.

2. In the selected 7 activities of fisheries development organisations, about 43.44 per cent of the fisherwomen participated on their own while 6.56 per cent of the women had participated under supervision or guidance of someone and about 12.81 per cent of them in collaboration with other co-workers. It indicates that about 62.81 per cent of the women had participated in the selected activities of fisheries development organisations while 37.19 per cent of them did not participate in any of these activities. None of fisherwomen participated in the teaching activity of the fisheries development organisations.

3. The educational status, social participation status, socio-economic status, annual income, information source exposure, risk orientation, economic motivation, scientific orientation, decision making pattern and spouse cooperation had established positive significant relationship with participation in small-scale fisheries and the activities of fisheries development organisations. The variables like age, size of labour force and extension system linkage had shown non-significant relationship. The variables, spouse cooperation, social participation status, annual income, socio-economic status and decision making pattern acted as crucial variables influencing the participation of fisherwomen in small-scale fisheries and the activities of fisheries development organisations.

5. 4. Constraints in participation

1. Problems of middlemen, procurement of fish, lack of transportation facilities, unemployment during off-season, lack of good marketing facilities, lack of working capital, inadequate credit facilities and savings, low price and high cost of ice were the major constraints faced by the fisherwomen in the participation of small-scale fisheries. More than 50.00 per cent of the respondents faced the above problems.

2. The constraint, high cost of raw materials, unfavourable weather condition, lack of training facilities, lack of technical know-how, lack of fisheries publications were also perceived by 12.81 to 48.13 per cent of the fisherwomen. Liquor addition by spouse was considered as a major problem by almost 90.00 per cent of the respondents.

5. 5. Certain aspects of training

1. Among the selected post harvest and small-scale fisheries technologies, the fisherwomen wanted training in preparation of fish/prawn pickles, hygienic handling of fish and fishery products, preparation of masimeen, fish meal, chank ornaments, shark liver oil, fish wafers, preparation of fish soup powder and seaweed culture in the order of preference. The fisherwomen had shown no preference in undergoing training on the preparation of shark fin rays, agar agar, chitosan and mussel culture.

2. About 68.13 per cent of the fisherwomen preferred to undergo training in their own village itself (peripatetic training). About 25.00 per cent of the women had preferred training at the institution. Only 6.87 per cent of respondent preferred farm school of AIR programmes.

3. About 62.50 per cent of the respondent preferred demonstration for training them. Group discussion was preferred by 24.69 per cent of them. Filed trips, study tour and lecture were preferred by only very meagre portion of the respondents. In the combination of training methods lecture cum demonstration was preferred by about 77.19 per cent of fisherwomen. About 17.50 per cent preferred discussion cum demonstration and only 5.31 per cent of them preferred lecture cum discussion cum filed trips methods for training them.

4. About 69.06 per cent of respondent had preferred to undergo training during the slack season. About 22.81 per cent had shown interest to undergo training

whenever required and only 8.13 per cent of the respondents had preferred training in all seasons.

5. More them 60 per cent of the respondents preferred training for a duration of 5 to 10 days.

6. As far as the size of training group is concerned about 50.63 per cent of them preferred upto 15 numbers and about 43.75 per cent preferred 16 - 25 trainees in a training programme.

5. 6. Prospects in small-scale fisheries

Promotion of small-scale fisheries industries by women needs to be encouraged by ensuring a reasonable share of credit and other inputs. Self- employment generates economic activity and can be viewed as providing unlimited opportunities for participation by fisherwomen. Various programmes have been undertaken by government to promote self-employment through training and credit assistance. All efforts should, therefore, be directed towards enhancing self-employment for the large masses of fisherwomen.

The preparation of fishery products would provide a considerable additional income to their families. Fish marketing is another important area where lots of fisherwomen are at present involved and this could be streamlined for effective functioning. Net mending, repairing and fabrication of fish baskets for the transport of catches to local and nearby markets could be undertaken by the fisherwomen as small cottage industry.

Further, opportunities are available in coastal aquaculture, training, ornaments fish culture, etc.

5. 7. Implications of the study

1. As the education level among the fisherwomen had low, there is a need for creating more educational programmes for them through government and voluntary organisations. Further, the NGOs could play a dominant role in organising non-formal education, utilising their leisure time.

2. The contact of fisherwomen with the extension system was low. Therefore, opportunities must be provided by way of organising and conducting many extension programmes to facilitate their exposure to these programmes. More trained extension workers and skilled personnel at field level have to be selected for providing more extension services to fisherwomen.

3. The awareness levels in small-scale fisheries and the activities of fisheries development organisations among the fisherwomen had found to be low. Hence, the Directorate of Fisheries in the state should formulate specific fisheries schemes for dissemination of such information to them fully utilising the mass media. Necessary steps may also be taken to create awareness among them by the universities, extension agencies and media agencies regarding the opportunities available in small-scale fisheries. Publications in the form of folders, leaflets, brochures, etc., may also to be in local language in various post-harvest technologies and made available to fisherwomen free of cost.

4. Similar to their counterpart in agriculture, fisherwomen too do not possess or control any worthwhile capital asset in spite of the fact that they generally contribute more to the family income than the menfolk. Hence, viable projects proposals exclusively for women in both traditional as well as emerging fields must be prepared for funding by financial institutions. NGOs also have a role to play as consultants in the preparation of viable project proposals. A more liberal credit policy for fisheries enterprise for women may be sought out as an incentive.

5. The best protection against any form of exploitation is the resistance that comes from the victim. Women, in general, need to be made aware that it is within their powers to resist. Fisherwomen, in particular, must be encouraged to form associations for the retail sale of fish, to increase their bargaining power against exploitation at the hands of professional money lenders, middlemen and private vehicle operators among others. Such associations would also act as a buffer against the inherent vagaries of the trade.

6. Training programmes are to be organised /conducted with special emphasis to local needs and resource availability. For training programmes, trainees aged between 25 and 40 with a minimum of high school education, frequenting to radio and newspapers, may be selected. They may be motivated to participate more in the activities of fisheries development organisations and social organisations like youth clubs, Farmers Associations, Cooperative Societies, etc.

7. The training programmes could be organised during the lean season for a duration of 5 to 10 days using lecture and demonstration methods of training. In order to get better results out of the training, the number of trainees should be restricted to the maximum number of 25 per training programme.

8. The menfolk of fishing families may be counselled to extend their fullest cooperation to their spouses trained in home based fisheries enterprises and its management.

9. Conducting regular educational programmes on hygiene, health and in various general aspects such as reading and writing, saving, etc. These types of developmental activities would facilitate the fisherwomen in developing awareness and knowledge on essential key issues like literacy, saving, health, etc.

10. Fish markets should be provided with proper sanitary facilities in order to protect the health of both sellers and the consumers.

11. In order to obtain any lasting results in achieving a degree of emancipation, women at all levels must be encouraged to participate in developmental activities and decision making.

12. The fisherwomen could also be trained in the culture of ornamental fishes in the backyard of their houses, which could provide additional income. Fabrication of fishing nets, fish traps and baskets for fresh fish transportation can also be taken up by the women as a cottage industry.

13. The Government of Tamil Nadu recently has proposed ***Meenaver Chanthai*** (Fisherfolk market) which could be effectively and efficiently utilised in order to eliminate the middlemen.

Suggestions for future research

1. A study on the management of small-scale fisheries to be carried out with more emphasis on the role of women.

2. The role and effectiveness of fisheries development organisations on small-scale fisheries may also be considered.

3. Manpower planning in fisheries education, research and administration also to be thought of.

4. A study on the technological advancements in fisheries and its impact on fisherwomen also be taken up.

5. A study of similar nature has to be conducted in other coastal and inland districts of Tamil Nadu.

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APPENDICES

Appendix -I

Women in Small - Scale Fisheries: Their Status, Problems and Prospects

INTERVIEW SCHEDULE

PART -I

Name of the District : Schedule No.

1. Name of the respondent :

   Taluk :
   Village :

2. Age in completed years :

3. Educational status : Illiterate/ Functionally literate/primary/ Middle/ Secondary/ Collegiate

4. Family status : (a) Nuclear / Joint family
   (b) Low caste (SC/ST)/ High caste (MBC/BC/FC)
   (c) Mud walled and thatched house
   Mud walled and tiled house
   Brick walled and tiled house
   Brick walled and concrete roof
   (d) Mud floor/ cement floor/ Mosaic floor
   (e) Unelectrified / electrified house

5. Occupational status : Wage earners
   Fishing + wage earners
   Fishing (small-scale fisheries)
   Fisheries business (self employed)
   Service (employed in govt. etc.)
   Fishing + business
   Fishing + service

6. Fisheries power status :

No.	Items	Number owned
	Crafts	
1	Catamaram	
2	Motorised catamaram	

3	Vallam	
4	Motorised vallam	
5	Mechanised boat	
6	Trawler	
	Gears	
7	Palmyra basket	
8	Bamboo basket	
9	Chala vala/Ayla vala (net)	
10	Cola vala (net)	
11	Drap net	
12	Shore seine	
13	Shrimp net	
14	Trawl net	

7. Material status :
Please indicate the following materials if possessed by you

No.	Items	Number owned
1	Wall clock	
2	Battery operated hand held transistor	
3	Radio	
4	Tape recorder	
5	Television	
6	Two wheelers	
7	VCP/VCR/VCD	
8	Telephone	
9	Automobiles (car, jeep, van, etc.)	
10	Others, if any	

8. Size of labour force : Below 5 members / above 5 members

9. Experience in small-scale fisheries :

10. Annual Income :
Please indicate the annual income from following sources
(a) From fishing : Rs.
(b) Animal husbandry : Rs.
(c) Wages : Rs.
(d) Service : Rs.

(e) Business : Rs.
(f) others : Rs.

11. Annual expenditure :

Please indicate the annual expenditure for the following items

(a) Family maintenance : Rs.
(b) Fisheries activity : Rs.
(c) Education : Rs.
(d) Dress : Rs.
(e) Recreation : Rs.
(f) Medicine : Rs.
(g) Others : Rs.

12. Social participation status

No.	Name of the institution	Member	Office bearer
1	Fisherwomen Cooperative Society		
2	Fishermen Cooperative Society		
3	Panchayat Unions		
4	Mahila Mandal		
5	Church group		
6	Adult Education Group		
7	Rural Radio Forum		

13. Communication status :
(a) No. subscription
(b) Subscription to Newspapers
(c) Subscription to weekly or monthly magazines
(d) Subscription to fisheries related magazines

14. Information source exposure :

Have you ever been exposed to messages related to fisheries through the following sources?

No.	Sources	Frequency of exposure	Purpose
1	Seminar	Number attended	
2	Training programme	Number attended	
3	Scientific books/literature	Owned/ Borrowed Number	

4	Newspaper	Subscribed / Borrowed Regular/ Occasional/ Never	
5	Fisheries related magazine and Other publications	Subscribed / Borrowed Regular/ Occasional/Never	
6	Radio programme	Owned/ depended on other Regular/ occasional/Never	
7	Television programme	Owned / dependent on other Regular/Occasional /never	
8	Others, if any please mention	Owned/ Dependent on other Regular/ Occasional/ Never	

15. Extension linkage system :

(I) Consultation with extension personnel

(a) Do you contact extension personnel? Yes / No.

(b) If yes, how often do you meet/ consult him/her from the following extension agencies

No.	Extension organisations	Frequency of contact					
		Once in a week	Once a fortnight	Monthly	Occasionally	Seldom	Never
1	Dept. of fisheries						
2	Universities/ Colleges						
3	Dept. of Forestry						
4	Fisherwomen Cooperative Societies						
5	Fishermen Cooperative Societies						
6	District Rural Development Agency (DRDA)						
7	Non-governmental Organisations (NGOs)						

II. Participation in extension methods

No.	Methods	Number	Frequency		
			Regular	Occasional	Never
1	Demonstration				
2	Exhibitions				
3	Field visits				
4	Educational tours				
5	Campaigns				
6	Lecture				
7	Trainings				

16. Risk orientation :

Please indicate your level of agreement / disagreement for the following statements.

No.	Statements	SA	A	UD	DA	SDA
1	Fisherwomen should participate in non fisheries activities to avoid greater risks involved fisheries activities					
2	Fisherwomen should take more number of chances for making big profit than to be content with smaller but less risky profit					
3	Fisherwoman who is willing to take greater risk than the average usually does better financially					
4	It is good for fisherwoman to take risk when she know her chances of success are fairly high					
5	It is better for fisherwoman not to try new small-scale fisheries activities unless most other fisherwomen have used it with success					
6	Trying entirely a new small-scale fisheries activity by fisherwomen involves risks but it is worth					

17. Economic motivation :

Please indicate your response for the following statements

No.	Statements	SA	A	UD	DA	SDA
1	Fisherwomen should work in small-scale fisheries activities and economic profit					
2	Making more profit in small-scale fisheries is the target of the fisherwomen					
3	Fisherwomen should invest in small-scale fisheries practices to gain higher profit					
4	It is difficult for the fisherwomen to involve in small-scale fisheries activities					
5	Fisherwomen must earn from small-scale fisheries activities to lead the reasonable living for the family					
6	Fisherwomen should try any activities than small-scale fisheries which earn more money					

18. Scientific orientation :

Please indicate your level of agreement / disagreement for the following statements

No.	Statements	SA	A	UD	DA	SDA
1	New methods small-scale fisheries gives better results to fisherwomen than old methods					
2	The way of fisherwomen's forefathers small-scale fisheries activities still the best way of fishing today					
3	Even fisherwomen with lot of experience should use new methods in small-scale fisheries					
4	Though it takes time for fisherwomen to learn new methods in small-scale fisheries, it is worthy efforts					
5	A good fisherwoman experiments with new ideas in small-scale fisheries					
6	Traditional method of small-scale fisheries have to be changed in order to raise the level of living of fisherwomen					

19. Decision making pattern :

Kindly mention who takes decision on the following activities.

No.	Activities	Decision pattern			
		Head of the family/ Respondent	Husband Alone	Jointly	Collec-tively
1	Purchase of fishing assets				
2	Beach side fishing				
3	Fish transportation				
4	Fish marketing				
5	Fish cleaning in the market				
6	Borrowing / lending money for fishing activities				

20. Spouse cooperation :

Please indicate the cooperation pattern of your spouse on the following areas.

No	Areas of cooperation	Cooperation pattern				
		Regul arly	Occasi onally	When ever asked	Insisted by family members	Never
1	In getting financial assistance a) From Nationalised Banks b) From Cooperative Societies c) From NGOs d) From private money lenders e) From friends and relatives					
2	In preparing fishy products a) Fish / prawn pickles b) Masmin/ fish wafers c) Fish liver oil /fish cutlet d) Preparing dried/ salted fish e) Preparing Agar Agar/chitosan					
3	Help in making / repairing a) Making hand fish net b) Repairing fishing nets c) Making fishing baskets d) Making ropes for fishing net e) Making chank ornaments					

4	Help in advertise fishy products a) Local Newspapers b) Through folder/ leaflets c) Through Radio d) Through supermarkets e) Through friends & relatives					
5	Transportation of catches a) Through Automobiles b) Through bicycles c) As head load d) To local markets e) To other village/town market					
6	Cooperate in a) Near shore fishing b) Beach side fishing c) Hand picking d) Hand netting e) Chank collection and selling					
7	In marketing a) Beach side sale b)Local market c) Through auction d) Through cooperatives e) Through private money lenders					
8	Help in participating a) Fisheries campaigns b) Off-campus training c) On campus training d) Seminars e) Field visits/ tours					
9	Moral support a) From spouse b) From family members c) From adult children d) From friends and relatives e) From co-workers					
10	Decision making in a) Earning additional income b) Daily household expenditure c) Children education d) Saving in banks e) Borrowing money					

21. Do you encounter any problem? : Yes/ No.

If yes, indicate the type of problems
1. 2.
3. 4.

22. What suggestions would you like to offer to over come such problems? :
1. 2.
3. 4.

PART- II

I. Knowledge level of fisherwomen in small-scale fisheries

Please provide the correct answer

1. Why the sardine fish plays a vital role in every day diet in poor man's life?

   a) For protein b) Available in cheap rate c) Easy to clean

2. What will happen if the fish is not dried?

   a) Decayed b) Loss of iron content c) Loss of weight

3. Name the fishes which are not processed without salt?

   a) Seer b) Shark c) Stolephorus

4. What is the size of salt used in salt drying?

   a) Big size b) Small size c) Both the sizes

5. What is the use of fish meal?

   a) Poultry feed b) Crop manure c) Human food

6. Which is the peak season for fishing?

   a) June -July b)November - December c) February -March

7. How long will it take for the preparation of masmin from soorai men?

   a) 2 hours b) 5 hours c) 10 hours

8. Identify the fixed cost in the preparation of fish and prawn pickles

a) Bottle cost b) Expenditure on ingredients c) Chemicals

9. What are the fishes used for the preparation of fish and prawn pickles?

a) Sardines b) All type of fishes c) Sharks

10. Agar agar is prepared from

a) Chemicals b) Seaweeds c) Fishes

11. Shrimp/prawn shells are used for the preparation of :

a) Agar agar b) Chitosan c) Fish pickle

12. Indicate the total number of cyclone shelters available in Tamil Nadu

a) 50 b) 94 c) 121

13. Seaweed can be cultured in

a) Ropes b) Freshwater c) In cages

14. What is the main role of Fisherwomen Cooperative Society?

a) Women leadership promotion b) Education c) Credit supply

15. Chank is used for

a) Preparing ornaments b) Medicine c) Lime

16. What is the use of insulated ice boxes?

a) To keep fish in good condition b) Transportation c) Marketing

17. What is the self life time of prawn pickle?

a) One year b) Six months c) Two months

18. Indicate the interest rate for fisherfolk housing scheme

a) 6.20% b) 7.00% c) 11.50%

19. Calcium carbonate is prepared from

a) Sea shells b) Chanks c) Lobsters

20. Indicate the amount for fisherfolk group accident insurance scheme
a) 10,000
b) 25,000
c) 50,000

II. Awareness and extent of participation :

Please indicate your awareness and extent of participation in the following small-scale fisheries activities:

No.	Small-scale fisheries activities	Awareness				Extent of participation			
		WA	A	SA	NA	Self doing —— Parti	Under supervision /guidance	Collaboration with others	Not participated
1	Collection of prawn seeds								
2	Collection of sea shells								
3	Drying of fish								
4	Salting of fish								
5	Seaweed collection								
6	Seaweed culture								
7	Marketing of fish and fishery products								
8	Act as a auctioneer								
9	Act as a retailer								
10	Transportation								
11	Labourer in processing firms								
12	Mussels culture								
13	Technical help in processing plants								
14	Working in sales centres								

15	Fabrication of fish cages								
16	Make/repair/baskets								
	Preparing variety of fishery products								
17	Fish pickle								
18	Prawn pickle								
19	Masmin								
20	Chitosan								
21	Agar agar								
22	Shark fin rays								
23	Fish wafers								
24	Fish soup powder								
25	Dried fish with masala								
26	Fish meal								
27	Shark liver oil								
28	Preparing shell crafts								
29	Lime shell collection								
30	Beach side fishing								
31	Chank diving								
32	Net mending / repairing								
33	Fish frying and selling								
34	Icing of fish								
	Participation in the activities of fisheries development organisations								
1	Administrative activities i) Honorary services								
2	Teaching activities i) Literacy programme								
3	Research activities i) Field studies								

4	Extension activities i) Awareness programme ii) Demonstrations iii) Exhibitions iv) Training v) Seminars								
5	Welfare activities i) Free housing ii) Group insurance iii) Health programmes iv) Saving -cum-relief -schemes								
6	Self-help group activities i) Credit and loans ii) Group formation								
7	Developmental activities i) Leadership development ii) Youth development								

WA= Well Aware A= Aware SA= Somewhat Aware NA= Not aware
Parti- Participation

Part - III

Please give your degree of training needs in the following major areas

Training need in major areas:

No.	Major areas	Degree of need		
		Much needed	Somewhat needed	Not needed
1.	Preparation of dry fish			
2.	Preparation of shark liver oil			
3.	Preparation of fish / prawn pickle			
4.	Preparation fish meal			
5.	Preparation of fish ensilage			
6.	Preparation of soup powder			
7.	Preparation Shark-fin ray			
8.	Preparations of masimeen			
9.	Preparation of fish flake			

10.	Preparation of fish murukku			
11.	Preparation of fish wafers			
12.	Preparation of Agar Agar			
13.	Preparation of Chitosan			
14.	Preparation of chank ornaments			
15.	Seaweed culture			
16.	Mussel culture			
17.	Hygienic handing of fish & fishery products			

Part - IV

Please give your degree of training needs in the following sub-areas.

Training need in sub-areas:

No.	Training areas	Degree of training need		
		Much needed	Somewhat needed	Not needed
1	Preparation of dry fish			
	a) Physical condition for drying			
	b) Selection of fish for drying			
	c) Time of salt penetration			
	d) Salt size			
	e) Fish - salt ratio			
2	Preparation of shark liver oil			
	a) Selection of shark			
	b) Separation of liver			
	c) Separation of oil			
	d) Preservation			
3	Preparation of fish / prawn pickle			
	a) Selection of fishes			
	b) Adding ingredients			
	c) Cooking time			
	d) Bottling and labelling			
	e) Marketing			

4	Preparation of fish meal			
	a) Selection of fish			
	b) Time of meal cooking			
	c) Time of processing and drying			
	d) Grinding			
	e) Marketing			
5	Preparation fish ensilage			
	a) Selection of type of fish			
	b) Acid amount			
	c) Fermentation period			
	d) Commercial usage			
6	Preparation of fish soup powder			
	a) Selection of fishes			
	b) Adding ingredients			
	c) Grinding			
	d) Soup powder fineness			
	e) Marketing			
7	Preparation of shark fish rays			
	a) Selection of quality shark			
	b) Processing method			
	c) Boiling time			
	d) Separation of muscles			
	e) Marketing			
8	Preparation of masimeen			
	a) Selection of soorai meen			
	b) Processing in salt			
	c) Smoking tome			
	d) Temperature			
	e) Packing and marketing			
9	Preparation of fish flake			
	a) Selection of quality fishes			
	b) Adding ingredients			
	c) Time and temperature during drying			
	d) Packing			
	e) Marketing			

10	Preparation of fish murukku			
	a) Selection of fishes			
	b) Adding ingredients			
	c) Frying method			
	d) Preservation			
	e) Packing and marketing			
11	Preparation of fish wafers			
	a) Selection of quality fish			
	b) Cooking time			
	c) Adding ingredients			
	d) Adding preservatives			
	e) Packing and marketing			
12	Preparation of Agar Agar			
	a) Selection of seaweed			
	b) Adding chemicals			
	c) Preparation techniques			
	d) Preservation			
	e) Packing and marketing			
13	Preparation of chitosan			
	a) Amount of shrimp/prawn shell required			
	b) Chemicals used			
	c) Drying time in sun			
	d) Preservations			
	e) Packing and marketing			
14	Preparation of marine ornaments			
	a) Type of sea shell required			
	b) Types of ornaments			
	c) Adding colours			
	d) Use of chemicals			
	e) Marketing			
15	Seaweed culture			
	a) Cultivable species			
	b) Collection techniques			
	c) Culture methods			

	d) Harvesting method			
	e) Marketing			
16	Mussel culture			
	a) Type of mussel			
	b) Culture technique			
	c) Adding mussel in the rope			
	d) Harvesting			
	e) Marketing			
17.	Hygienic hand ling of fishes			
	a) Icing of fishes			
	b) Use of chlorinated water			
	c) Insulated ice boxes for transport			
	d) Cleaning vessel, etc			
	e) Sanitations technique			

Part - V

Please give your opinions for the following:

1. When do you want the training to be conducted?

   a) All seasons b) During slack season c) Whenever required

2. Training method: Here are some training or teaching methods. Give your order of preference.

   (i) Single method:

   a) Demonstration
   b) Group discussion
   c) Field trips / study tour
   d) Lecture

   (ii) Combination of methods

   a) Lecture cum demonstration
   b) Discussion cum demonstration
   c) Lecture cum discussion cum field trips

3. Please indicate the types of training you require

   a) Institutional training

b) Peripatetic training
c) Lesson through AIR

4. Duration of training: Give your preference for the duration of training

a) 5-10 days; b) 11-15 days; c) 16-20 days; d) 21-25 days e) above 25 days

5. Please give your order of preference for the size of training group.

a) Below 15 fisherwomen
b) 16-25 fisherwomen
c) 26- 35 fisherwomen
d) 35 - 50 fisherwomen
e) Above 50 fisherwomen

Appendix - II

Tamil Nadu Veterinary and Animal Sciences University

O/o. the Professor & Head
Department of Extension
Veterinary College & Res. Inst.
Namakkal - 637 002

Date: 12.12.1997

Sir,

Sub: Ph.D., Research programme - Women in Small - Scale Fisheries: Their Status, Problems and Prospects - variable selection - selection of small-scale fisheries items - Spouse cooperation - for inclusion - selection - requested - regarding.

#######

Greetings.

This is in connection with a Ph.D., student, Mr. N.V. Sujathkumar Assistant Professor, Department of Animal Husbandry Extension, Veterinary College and Research Institute, Namakkal. He had taken a research work on ***Women in Small - Scale Fisheries: Their Status, Problems and Prospects***.

You are chosen as a judge based on your experience and familiarity with the subject and area. Kindly spare some of your valuable time and offer judgment in this regard.

I am enclosing the following annexure and I request you to kindly indicate/ suggest the relevant of items to the selected topic in a five-point continuum on putting a (✓) mark against each. I also request that the finished annexure may please be sent to the student in the enclosed envelope.

Thanking you

Yours faithfully

(R. Krishnaraj)

ANNEXURE - 1
LIST OF VARIABLES

No.	Name of the variables	Most relevant	More relevant	Relevant	Less relevant	Least relevant
1	Age					
2	Educational status					
3	Family status					
4	Size of labour force					
5	Occupational status					
6	Material possession					
7	Experience in small-scale fisheries					
8	Craft holding					
9	Gear holding					
10	Annual income					
11	Annual expenditure					
12	Type of fishing					
13	Communication status					
14	Fishing season					
15	Fishing distance					
16	Risk orientation					
17	Market perception					
18	Scientific orientation					
19	Credit orientation					
20	Social participation status					
21	Media participation					
22	Economic motivation					
23	Attitude towards risk and uncertainty					
24	Information source exposure					
25	Training needs					
26	Awareness of fishing methods					
27	Extension system linkage					
28	Non fishing skills					
29	Decision making pattern					
30	Spouse cooperation					
31	Extent of participation					
32	Innovativeness					

ANNEXURE -2
LIST OF ACTIVITIES

No.	Name of the small-scale fisheries activities	Most relevant	More relevant	Relevant	Less relevant	Least relevant
1	Marketing fish and fishery products					
2	Fabrication of fish cages					
3	Sun drying of fish					
4	Salting of fish					
5	Icing of fish					
6	Lime shell collection					
7	Fish cleaning in the market					
8	Collection of prawn seeds					
9	Act as auctioneer					
10	Act as retailer					
11	Collection of sea shells					
13	Seaweed culture					
14	Seaweed collection					
15	Beach side sale					
16	Preparing marine shell crafts ornaments					
17	Make/repair fish baskets					
18	Fish frying and selling					
19	Fish transportation					
20	Labour in processing firms					
21	Working in sale centres					
22	Technical help in processing plants					
23	Mussel culture					
24	Attaching mussel in the rope for mussel culture					
25	Preparation of fish pickle					
26	Preparation of prawn pickle					
27	Preparation of masmin					
28	Preparation of Chitosan					
29	Preparation of Agar agar					
30	Preparation of shark fin rays					
31	Preparation of fish wafers					

ANNEXURE -2
LIST OF ACTIVITIES

No.	Name of the small-scale fisheries activities	Most relevant	More relevant	Relevant	Less relevant	Least relevant
1	Marketing fish and fishery products					
2	Fabrication of fish cages					
3	Sun drying of fish					
4	Salting of fish					
5	Icing of fish					
6	Lime shell collection					
7	Fish cleaning in the market					
8	Collection of prawn seeds					
9	Act as auctioneer					
10	Act as retailer					
11	Collection of sea shells					
13	Seaweed culture					
14	Seaweed collection					
15	Beach side sale					
16	Preparing marine shell crafts ornaments					
17	Make/repair fish baskets					
18	Fish frying and selling					
19	Fish transportation					
20	Labour in processing firms					
21	Working in sale centres					
22	Technical help in processing plants					
23	Mussel culture					
24	Attaching mussel in the rope for mussel culture					
25	Preparation of fish pickle					
26	Preparation of prawn pickle					
27	Preparation of masmin					
28	Preparation of Chitosan					
29	Preparation of Agar agar					
30	Preparation of shark fin rays					
31	Preparation of fish wafers					

32	Preparation of fish soup powder					
33	Preparation of dried fish with or without masala					
34	Preparation of fish cutlet					
35	Preparation of shark liver oil					
36	Preparation of fish flakes					
37	Preparation of algenic acid					
38	Preparation of fish murukku					
39	Preparation of ensilage					
40	Preparation of fish meal					
41	Preparation of icing glass					
42	Preparation chank pickle					
43	Preparation of sweet fish/ prawn pickle					
44	Collection of corals					
45	Watcher of fishing boats					
46	Cleaning of fishing boats					
47	Purchase of materials for boat building yard					
48	Net mending / repairing					
49	Ornamental fish culture					
50	Fish feed preparation					
	List of activities of fisheries development organisations for fisherwomen					
1	Credit and saving i) Loans ii) Repayments iii) Savings					
2	Administrative activities i) Honorary services					
3	Income generation activities i) participation in non-fisheries activities ii) Establishment of small enterprises					
4	Developmental activities i) Leadership development ii) Youth development					
5	Research activities i) Field studies					

6	Family planning activities					
7	Non-formal literacy training activities					
8	Extension activities i) Awareness programme ii) Demonstrations iii) Exhibitions iv) Training v) Seminars					
9	Self-help group activities i) Credit and loans ii) Group formation					
10	Welfare activities i) Free housing ii) Group insurance iii) Health programmes iv) Saving -cum-relief - schemes					
11	Teaching activities i) Literacy programmes					
12	Leadership promotion activities					
13	Health (nutritional) activities					

ANNEXURE -3
LIST OF AREAS OF SPOUSE COOPERATION

No.	Areas of cooperation					
		Most relevant	More relevant	Relevant	Less relevant	Least relevant
1	**In getting financial assistance** a) From Nationalised Banks b) From Cooperative Societies c) From NGOs d) From private money lenders e) From friends and relatives					
2	**In preparing fishy products** a) Fish / prawn pickles b) Masmin/ fish wafers c) Fish liver oil /fish cutlet d) Preparing dried/ salted fish e) Preparing Agar Agar/Chitosan					
3	**Helped in making / repairing** a) Making hand fish net b) Repairing fishing nets c) Making fishing baskets d) Making ropes for fishing net e) Making chank ornaments					
4	**Helped in advertise fishy products** a) Local Newspapers b) Through folder/ leaflets c) Through Radio d) Through supermarkets e) Through friends & relatives					
5	**Transportation of catches** a) Through Automobiles b) Through bicycles c) As head load d) To local markets e) To other village/town market					
6	**Cooperate in** a) Near shore fishing b) Beach side fishing c) Hand picking d) Hand netting e) Chank collection and selling					

7	**In marketing** a) Beach side sale b) Local market c) Through auction d) Through cooperatives e) Through private money lenders					
8	**Helped in participating** a) Fisheries campaigns b) Off-campus training c) On campus training d) Seminars e) Field visits/ tours					
9	**Moral support** a) From spouse b) From family members c) From adult children d) From friends and relatives e) From co-workers					
10	**Decision making in** a) Earning additional income b) Daily household expenditure c) Children education d) Saving in banks e) Borrowing money					
11	**Helped forming self-help group** a) Helped in organising b) Informing members c) Moral support d) Financial assistance e) Getting loan					
12	**Purchase of accessories** a) Fish baskets b) Fishing gear c) Materials for basket making d) Nylon ropes e) Cotton ropes					
13	**Purchase of assets** a) Lands b) House c) House building materials d) Household articles e) Electronic goods					

ANNEXURE - 4
LIST OF PROSPECTS AVAILABLE FOR FISHERWOMEN

reas of prospects					
	Most possible	More possible	Possible	Less possible	Not possible
reparation of fishery products					
ish marketing					
ish transportation					
abrication of fishing gear & askets					
Marine ornamental fish culture					
Opportunities in coastal aquaculture					
Prospects in freshwater ornamental fish culture					
Opportunities in fisheries training					
Self employment opportunities					
Preparing marine shell crafts					
Establishment of small fisheries enterprises					
Organisation of self-help group					
Organisation of women association					
Fish processing					
Tailoring					
Coir rope making					
Fish basket making/ repairing					
Opportunities in education					
Welfare programmes					
Nutrition programmes					
Free housing schemes					
Media for information					
Opportunities in NGO programmes					
Part-time jobs in sales centres					
Credit opportunities					
Others, if any, please include					

APPENDIX V - INTER CORRELATION MATRIX

	X1	*X2*	*X3*	*X4*	*X5*	*X6*	*X7*	*X8*	*X9*	*X10*	*X11*	*X12*	*X13*	*X14*	*X15*	*X16*
X1	1															
X2	.0235410	1														
X3	-0.024136	0.025917	1													
X4	0.091197	0.010867	0.000388	1												
X5	-0.056759	0.043217	0.241867	0.073633	1											
X6	0.113567	0.046251	-0.042642	0.074037	0.036935	1										
X7	0.906906	0.205602	0.044124	0.057233	0.077984	0.084931	1									
X8	0.365219	0.140136	0.012128	0.028793	0.120108	0.076942	-0.501355	1								
X9	0.342391	0.079892	0.020479	-0.012213	0.019857	0.090645	0.017634	0.886514	1							
X10	0.081935	0.042705	0.080804	0.893953	-0.044552	0.029333	0.056107	-0.063511	0.066177	1						
X11	0.304662	0.056151	0.125548	0.031449	0.138978	0.027379	0.002495	0.024318	-0.021996	-0.051564	1					
X12	0.026008	-0.102733	-0.044261	0.027786	0.085306	-0.015599	0.011286	-0.066666	-0.098124	-0.026125	-0.012637	1				
X13	0.047199	0.012978	-0.022289	0.020487	0.121407	0.019445	-0.183013	0.031412	0.033799	0.006344	0.067048	0.070725	1			
X14	0.031767	0.022269	0.040972	-0.055541	-0.041235	0.039558	0.018587	0.042666	0.054201	0.015158	0.061023	-0.045693	0.067903	1		
X15	0.010228	0.041924	0.061995	0.067256	0.080643	-0.010278	-0.018969	0.048522	0.020911	0.065641	-0.004553	0.032131	-0.026786	0.029741	1	
X16	0.092497	0.081882	0.014496	0.079458	0.135191	0.046721	0.058267	0.021668	0.017938	0.013134	0.102883	0.030784	0.158386	0.116894	0.049218	1

Plate 7 **Labelling of fish pickle bottles prepared by the trained fisherwomen**

Plate 8 **A fisherwoman cleaning chanks for preparing shell crafts**