Agricultural Economics Research Review
Vol. 29 (No.2) July-December 2016 pp 253-266
DOI: 10.5958/0974-0279.2016.00052.5

Socioeconomic Status of Fisher-Women in Segmented Fish Markets of Coastal Karnataka§

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Abstract

The study has assessed the changes in the socioeconomic status of women fish retailers of Karnataka coast, who are threatened by the competition from the emergence of men fish venders, organized retail shops, super stores, etc. Based on the primary data collected from 300 households in two major fish markets of Mangalore and Malpe in the coastal Karnataka, the study has provided a comprehensive assessment of the socio-demographic, economic and social status of different categories of fish retailers. The study has shown that with high socio-economic capital, the fisher women provide a substantial support to the family welfare and income. However, with increasing market share and income of the younger men retailers, the fisher women retailers are being marginalized in spite of their excellent marketing skills and comparable levels of profitability. The present study has provided the basis for further research on the assessment of social capital among the fish retailers in coastal Karnataka.

Key words: Socioeconomic status, social capital, fisheries, fisher women, Karnataka

JEL Classification: A14, E 22

Introduction

The coastal ecosystem of Karnataka is a mosaic of monsoon wetlands, beaches and mountains, some as high as 2000 metres, stretched along its 300-km long shoreline. The coastal Karnataka has 191 marine fishing villages spread across the three districts, which make it one fishing village, each covering about 1.6 km of the coastal line on an average. Karnataka, in the south-west part of India, is one of the states with high density of fishers' population.

Marine fisheries is one of the major industries in coastal Karnataka (Bhatta, 2000). According to Central Marine Fisheries Research Institute (CMFRI) (2010), Karnataka has 30,713 fishermen families, 1,67,429 fishers population, and 14,023 numbers of total fishing crafts. According to the Government of Karnataka (GoK, 2009), more than 60 per cent of the total fishers are small-scale fishers. Women formed 48 per cent of the population and the female to male ratio was 916 for 100 males (CMFRI, 2010). During 1980 to 2009, the number of trawlers grew from 1833 to 2441 and motorised boats increased from 974 in 1990 to 4,298 in 2009. During the past 20 years, the number of traditional (motorised and non-motorised) boats has increased by 47 per cent. In recent years, the deep-sea fishing has been developed with the help of imported speed engines and has reduced the number of days of fishing trips in a month varies from as high as 15-20 days to as low as 3-5 days. In 2007-08, of the total Indian fish catch, 4.24 per cent was landed in Karnataka. Karnataka's contribution to the national

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§ The paper is based on Ph.D. thesis, 'Role of Economic and Social Institutions in the Fisheries Post-harvest Sector of Coastal Karnataka' submitted by the first author in 2012 to the Mangalore University, Mangalagangothri.

marine fish production varied between 13 per cent and 5 per cent annually during 1980-2009. It contributes around 5 per cent of India's seafood exports and ranks 6th in fish export (GoI, 2008). In 2008-09, the marine fish export of the state accounted for 33,000 tonnes, valued at ₹ 26,400 lakh (GoK, 2009). The inherent rich inland waters and rivers at the foot of the Western Ghats, with 27,000 sq km of Indian EEZ, are the parts of Karnataka marine fisheries. More than 75 per cent of the commercial fish catch is dependent on estuaries for part of their life-cycle (Bhatta and Bhat, 1998).

The fisheries management policies require physical and socio-economic information to devise the measures that need to be incorporated in reducing the adverse impacts on fishing (Platteau, 1984). Mahon and McConney (2004) have suggested the need for an essential shift in emphasis from technology to people. Such a shift requires the use of socio-ecological system (Berkes *et al*., 2001) and becomes easier with rich social capital among the stakeholder groups. In this paper, we explore the socio-economic perspective of retailing firms with a focus on their management practices. Thus, the focused objectives of this study are:

- Characterization of retail market segments with women fish sellers,
- Conducting a comprehensive analysis of socio-demographic and economic profile of the fisher women retailers, and
- Identification of contributions of fisher women retailers and threats to their sustainable livelihood.

Characteristics of Small-scale Fish Retailers

There is no single model which could explain the structure of retail fish markets. A closer observation and micro level assessment of retail fish markets reveal the following characteristics:

1. The fish-retailers operate with small investments and are dependent on local resources.
2. Fishing constitutes an integral part of the family of these fish-retailers, although there is no direct marketing link between their fishing and retailing activities.
3. There is greater reliance on personal communication, and product differentiation through sales promotion, etc. The use of modern marketing techniques and market promotions through media are almost absent.
4. The retailers do not identify themselves as part of the modern retailing firms that have been emerging during the past three years.

These fish-retailers sell homogeneous products but can be differentiated through various value-added services. They provide following types of value-added services, either free or for a small service charge, to their regular customers:

- Supplying the required variety of fish, if the order is given in advance.
- Cutting, cleaning, etc. of fish at no or marginal service charge.
- If the buyer- preferred fish is not available with them, they arrange for the same fish from the fellow retailers and sell to their customers at par prices.
- Guidance on how to cook fish.

There are a large number of small retail firms and the primary retail markets represent the competitive market structure. They mostly sell small and large pelagics such as, mackerel, sardine, crockers, white sardine, etc. which are harvested by trawl, purse-seine and other nets.

Data and Methodology

There is high diversity across small retail business in fish trade. The present study is based on the data collected from the primary survey of 268 respondents of small fish retailers. It was observed during the process of pre-market survey that the fish retailers were not a homogeneous group and they could be classified into four broad groups, viz. fresh fish-retailers, dry fish-retailers, head loaders, and two-wheeler retailers.

Fresh fish-retailers (Fixed selling point women retailers) — This comprises of fisher-women who undertake fish retailing at their designated places, which are taken by them on rent on daily basis from the agent who has taken the market on annual lease basis from the local self-government institution (city municipal corporation/gram panchayat). The daily rent is fixed in terms of per basket sold. Thus, these fish-retailers are located at one selling point and have

Table 1. Determination of sample size

'*c*'(C.V)	0.5	0.6	0.7	0.8	0.9	1.00
Sample size ($n= c^2/e^2$)	100	144	196	256	324	400

Source: Murthy (1977)

relatively little variability in the sales, except for irregular fluctuations.

Dry fish-retailers — These are the women retailers who sell dry fish in the fresh fish market and their number is relatively less. They also occupy the places by paying rent to the person who has leased the market from the local self-government.

Head loaders (Mobile women retailers) — The head loaders are women retailers who sell fresh fish from door to door or sell at a fixed location of village/ ward for a few hours in a day. They buy fish in baskets from the wholesale market or from the fellow traders who buy fish in bulk. They carry fish through head loads, small tempo, auto-rickshaw or bus to their respective wards/ village for marketing.

Two-wheeler retailers (Mobile men retailers) — They are the men retailers who reach out interior places much faster than their counterpart- head loaders, through M-80/ Motor bike. They compete and try to capture the market from the head loaders, especially in the city and in the extension areas.

For a proper representation of a segmented market stratified sampling was used. Although a number of super markets have started selling fish in their specialized shops, their share in the total sales is negligible and hence they were excluded from the study. In the absence of any information on the total number of retailers (i.e., population size) in each category, it was difficult to arrive at an optimum sample size. Although some information on the number of fresh fish and dry fish-retailers in one or two market/s was available, generally they keep moving from one market to another. Similarly, there was no way to arrive at the actual number of head loaders and two-wheeler retailers in the study area. Accordingly, the following formula was used for the determination of the sample size (Murthy, 1977).

The sample size '*n*' is given by: $n = \frac{c^2}{e^2}$

where '*c*' corresponds to the co-efficient of variation (C.V.) of the population of interest and '*e*' corresponds to the percentage of error tolerable in the estimation procedure. Generally, the percentage of error is fixed at 5 per cent (e=0.05). Table 1 gives the sample size for various values of '*c*'.

Since population C.V. is unknown, the sample size was determined in such a way that the worst possible scenario (the situation when population C.V. is large) could be accommodated. Considering the cost of data collection and tolerable level of coefficient of variation, it was decided to limit the sample size (n) to 300. The sample was further sub-divided into 200 from the market retailers (fresh fish and dry fish-retailers), 60 head loaders and 40 two-wheeler retailers, based on their approximate population size (unknown).

Stratified two-stage sampling design was used for selecting the retailers. The districts of Dakshina Kannada and Udupi were considered as the strata and markets were treated as first stage sampling units and retailers as second stage units within each stratum. The stratification used in the survey was similar to the two-stage sampling design used by the National Sample Survey Organisation (NSSO). Accordingly, five fish markets, namely, Mangalore central, Urwa, Bajpe, Surathkal, and Ashokanagar from Dakshina Kannada and five from Udupi district, namely, Hejamadi, Padubidri, Kapu, Katapadi and Udupi, were selected at random. The randomization was within urban and within semi-urban markets of the two districts. From the selected markets, a sample of 200 market retailers (fresh fish and dry fish-retailers, excluding head-loaders) was selected at random.

For the selection of head loaders and two-wheeler retailers, information regarding these retailers was collected from enquiries in the respective markets. Further, the head loaders and two-wheeler retailers, who normally do not come under the purview of one single market, but purchase their stock from the landing centres and may sell in the vicinity of these markets

Table 2. Distribution of sample fish-retailers in urban and rural markets of Karnataka

Respondents (Fish retailers)	Urban markets		Rural markets		Total sample size	Total useable response
	Sample size	Useable response	Sample size	Useable response		
1. Market traders						
Fresh fish-retailers	112	100	54	51	166	151
Dry fish-retailers	20	16	14	11	34	27
2. Head loaders	27	24	33	33	60	57
3. Two-wheeler retailers	15	10	25	23	40	33
Total	174	150	126	118	300	268

Source: Survey Data 2010-11

and/or within the radius of 20-25 km, were also considered in the selection of sample. Further, the head loaders and two-wheeler traders shuttle between the places and keep attracting the customers during most part of the day, they would find it difficult to respond. Therefore, they had to be interviewed during their leisure time, especially during lunch break, using well-structured questionnaire. The average time taken for completing a questionnaire was 50-60 minutes.

The questionnaire was framed in the local spoken language, 'Tulu' to make them more homely and to create a sense of bondage. In all, 300 questionnaires were administered, but some of them could not be used since the respondents did not provide the full information due to a variety of reasons. The hostile environment that prevailed in a couple of markets due to opening of modern fish retail store by a government company also made them indifferent and suspicious of such data collection process. In all, complete information was collected from 268 respondents. Table 2 presents the distribution of sample design of the study. The post-stratification of retailers showed that 56 per cent of the respondents were women fixed point traders, 10 per cent were women dry fish-retailers, 21 per cent were women head loaders (mobile) and 12 per cent were mobile (two-wheeler) men retailers.

The primary data were analysed using the Statistical Package for Social Science (SPSS version 13). The study is likely to help planners to develop strategies for the vulnerable groups of retailers.

Results and Discussions

The socio-economic conditions of families involved in fish marketing depend on the market structure in which they function (Ibrahim, 1992). The small-scale marketing is mostly controlled by the ethnic communities with some kind of restrictions based on the community involvement (Kurien, 1988). For example, the wholesale marketing is broadly controlled by the Muslims, but the retailing is still controlled by the women belonging to fisher communities (Kurien, 2005). The men-retailers are emerging as a dominant category slowly in the retail sector. Table 3 presents the profile of retail market structure.

The market structure presented in Table 3 shows that the retail market does not have the characteristics of a competitive market. The study of informal trade in Ecuador (Teltscher, 1994) shows that, although products are homogeneous, many factors including community-based restrictions on entry and exit make it less competitive. Apparently, small-scale operations, low investment, large number of retailers and with large number of buyers indicate the existence of a market which is closer to the perfect competition (Murickan, 1983).

Livelihood Profile

Livelihood profile provides a comprehensive picture of various characteristics of the households. It helps to understand not only their present socio-economic status and also the options available to them to enhance their income (Narayan and Pritchett, 1999). It also helps to measure the impact of any policy change on their income and other opportunities. Table 4 presents the data collected on livelihood profile of the four identified fish retail categories and makes a meaningful comparison.

Table 3. Fish retail market structure in Karnataka

Characteristics	Fixed point fresh fish-retailers	Fixed point dry fish-retailers	Mobile fresh fish women-retailers	Mobile fresh fish men-retailers
Scale of operation	Large	Medium	Small	Medium
Entry and exit	Restricted (community-based)	Restricted (community-based)	Easy	Easy
Number of customers	Large	Moderate	Small	Large
Average working capital (₹)	2000-3000	2000-3000	500-1000	2000-3000
Type of species	High-value and low-value (mixed)	High-value and low-value (mixed)	Low-value	High-value and low-value (mixed)
Purchase point	Landing centre	Whole sale retailers	Market place and landing centre	Landing centre
Approximate number of customers	20-50	15-20	15-25	20-60
Average investment in physical assets (₹)	2000	3000	500	6000
Work hours	10-12	10-12	10-12	9-10
Area of operation	Fixed market place	Fixed market place	Village area town layout extensions	Town and village area (interior)
Variety of species	Large and diversified	Diversified	Limited	Large
Competition	Moderate	Moderate	High	Low
Risk	Moderate	High	High	low
Partnership	Present	Rarely	Never	Never

Source: Survey Data 2010-11

Table 4 reveals that the average family size was of 5.5 members and two-wheeler traders were the youngest among all the fish retailing categories. The age-wise distribution of fish-retailers shows that majority of women retailers belonged to the middle age group (46-55 years). The average age of men retailers was lower at 38 years. Thus, it can be inferred that the younger women are quite skeptical of entering fish marketing because of social reasons and marketing is mainly carried out by the middle-aged, married women in the case of both fresh fish and dry fish-retailers. One of the important determinants of the performance of retailers is their annual average family income. The highest annual business income was of two-wheeler retailers (₹67,418), followed by fresh fish-retailers (₹55,652), dry fish-retailers (₹47,244) and head loaders (₹44368). Thus, the male fish sellers with quick mode of transportation were able to reach the consumers fast and sell at a better margin compared to their women counterparts. Over the years, the women-head loaders are experiencing declining business income and are being competed out. In terms of annual family income, the men-retailers had the highest gross income, followed by fresh fish and dry fish retailers.

Another indicator of the success of two-wheeler retailers is the highest average annual savings of ₹9,563 compared to only ₹3,472 for their counter parts, namely women head-loaders. Thus, in spite of higher operating cost (transportation, fuel, etc.), the two-wheeler retailers were able to achieve a higher savings rate. The household expenditure on food and non-food items is an indicator of its quality of life. Higher percentage of expenditure on non-food items indicates increased access to social activities, utilities and consumer goods. The share of non-food expenditure as a tool for measurement is commonly used in the studies (Hapke, 2001b). The mobile-retailers (male) have depicted an expenditure of ₹53,163 annually on non-food items, which is around 5-times higher than their counterparts (head-loaders) and 2-times higher than fresh fish fixed point retailers. One of the main reasons for higher expenditure among two-wheeler retailers could be their

Table 4. Livelihood profile of sample fish-retailers in coastal Karnataka

Characteristics	Retail categories				Overall (N=268)
	Fixed point retailers		Mobile retailers		
	Fresh fish (N=151)	Dry fish (N=27)	Head loaders (N=57)	Two-wheeler retailers (N=33)	
Average family size (No.)	5.4 (2.3)	5.6 (2.4)	5.6 (2.8)	5.5 (1.7)	5.5 (2.3)
Average age (years)	46 (8.8)	55 (7.9)	52 (10.3)	38 (10.3)	47 (10.3)
Average annual income of retailer (₹)	55652 (21491)	47244 (21461)	44368 (14451)	67418 (9676)	53854 (20188)
Average family income (₹)	130100 (77769)	119911 (74411)	111252 (111252)	104509 (90098)	121914 (77728)
Average annual savings (₹)	8450 (4238)	4130 (1713)	3472 (1865)	9563 (7737)	7462 (4790)
Household annual food expenditure (₹)	27949 (12190)	24104 (6354)	25327 (11555)	30278 (8418)	27290 (11274)
Household annual non-food expenditure (₹)	21585 (29585)	18979 (15012)	9994 (5575)	53163 (100589)	22746 (43406)
Main occupation of dependants	Fishing	Fishing	Non-fishery services	Non-fishery services	Not applicable
Average No. of male members in a family	2 (1.37)	2 (1.43)	3 (1.51)	2 (1.15)	2 (1.38)
Average No. of females in a family	3 (1.25)	3 (0.98)	3 (1.10)	2 (.80)	3 (1.18)
Average No. of children in a family	3 (0.56)	3 (0.64)	3 (0.64)	2 (0.32)	2.75 (0.45)
Percentage of households depending on					
Fish harvesting	70.75	70.42	53.85	0.00	60.97
Fishery- related activities	10.00	5.63	9.61	57.89	13.45
Non-fishery services	17.00	22.54	30.77	42.11	22.8
Business	2.25	1.41	5.77	0.00	2.78

Note: Figures within the parentheses represent standard error
Source: Survey Data 2010-11

higher income from non-fishery business services. The percentage of households with income from non-fishery services was highest for two-wheeler retailers (42%), followed by head loaders (31%) and dry fish-retailers (23%). Thus, the emerging scenario indicates that men retailers are able to compete with the women retailers and are likely to emerge stronger in the coming years and threatening the role of fisher women. The majority of women retailers of all categories are dependent on fish harvesting (Table 4). An integration of harvesting and retailing among women retailers was observed and, thus, the loss of income due to poor catch was compensated by higher prices through retailing, although these operations were being carried out independently by the family members. In the case of men retailers, such integration was found with fishery-related and non-fishery-related business. The head loaders who did not have such integration were likely to be more susceptible to business risks and had fewer livelihood options.

Educational Status of Fish-retailers

The educational status of the retailers represents their opportunity to move to other occupations,

Table 5. Educational status of fish-retailers in coastal Karnataka

Level of education (No. of schooling years)	Retail categories				Total
	Fixed point retailers		Mobile retailers		
	Fresh fish	Dry fish	Head loaders	Two-wheeler retailers	
1-7	82 (54.30)	13 (48.10)	39 (68.40)	15 (45.50)	149 (55.60)
8-10	23 15.20)	5 (18.50)	3 (5.30)	6 (18.20)	37 (13.80)
12 and above	3 (2.00)	1 (3.70)	0 (0.00)	3 (9.10)	7 (2.60)
No education	43 (28.50)	8 (29.60)	15 (26.30)	9 (27.20)	75 (28.00)
Total	151 (100)	27 (100)	57 (100)	33 (100)	268 (100)

χ^2=14.167, p=0.117, NS d.f. = 9
Note: Figures within the parentheses represent percentage of respective column.
Source: Survey Data 2010-11

awareness of market opportunities and also avail benefits from the state-sponsored welfare schemes (Indian Institute of Management, 1984). Hence, educational level of fish-retailers was carried out and is presented in Table 5.

It revealed that only 2.6 per cent of the total retailers were educated above 12th standard. The educational qualifications of men two-wheeler retailers was relatively low compared to their counterparts such as head loaders. Although the region has been declared as fully-literate (GoK, 2010), it is observed that nearly 28 per cent of the overall respondents had no formal education. Further, the level of education had no significant impact on the retail categories of fixed-point and mobile retailers (χ^2 =14.167, p=0.117).

Marital Status and other Demographic Features

The relationship between marital status and other demographic features is one of the important indicators of quality of life of fish-retailers, especially, fisher women. This is particularly true in a traditional fishermen community where women play a pivotal role in managing the family. The result of study on marital status of fish-retailers and its comparison with other demographic features like average age and annual income which helped to assess the extent of their vulnerability, is presented in Table 6.

Table 6 reveals that among the sample fish-retailers 67.5 per cent were married, 4.5 per cent were unmarried and 28 per cent were widows. It also explains the difference in the socio-economic conditions with respect to marital status of fish-retailers. The annual income of widows was least (₹46,712), followed by married and single women retailers. This indicates the vulnerability of those traders who operate their business without family support and have less social capital. Thus, widow women fish-retailers who constituted the majority (63%) of dry fish-retailers and head loaders (37%) were exposed to risk factors. The traditional community based institutions used to take care of such situations by allocating a part of the catch at concessional price to such vulnerable sections. However, such a system has deteriorated over the years with centralized landings in fisheries harbours and mechanization.

Expenditure Patterns across Fish-retailers

To understand the socio-economic conditions of fish-retailers, analysis of income and expenditure levels are very important (Manrique and Jensen, 1998). It has been found that the food habits of people vary according to socio-economic factors, regional constraints and ethnic traditions. Hapke (2001a) confirms this observation in her studies on petty traders in a south Indian fishery. Similarly, the share of expenditure on non-food items indicates the importance attached to the investment on human resources such as education, health and utilities (Table 7).

The fish-retailers as one of the production and distribution systems tend to incur about 20- 24 per cent of their total food expenditure on fish at imputed price. The fish-retailers spend relatively low on fruits and vegetables, meat/chicken/egg, milk and other items as

Table 6. Demographic and marital status of women fish-retailers in coastal Karnataka

Socio-economic factors	Marital status			
	Single (N=12)	Married (N=181)	Widow (N=75)	Overall (N=268)
Family size (No.)	6.33 (2.50)	5.56 (2.10)	5.29 (2.80)	5.52 (2.30)
Annual income (₹)	76000 (17225)	55345 (18836)	46712 (20657)	53854 (20188)
Average age (years)	33 (12.96)	45.23 (8.62)	55.35 (8.21)	47.51 (10.29)
Retailers category (in percentage)				
Fresh fish (N=151)	2.00	75.50	22.50	100
Dry fish (N=27)	0.00	37.00	63.00	100
Head loaders (N=57)	0.00	57.90	42.10	100
Two wheeler retailers (N=33)	27.30	72.70	0.00	100
Total (N=268)	4.50	67.50	28.00	100

Note: Figures within the parentheses represent standard error.
Source: Survey Data 2010-11

Table 7. Expenditure patterns of fish-retailers in coastal Karnataka

Expenditure pattern	Fish-retailers categories				Overall (N=268)
	Fixed point retailers		Mobile retailers		
	Fresh fish (N=151)	Dry fish (N=27)	Head loaders (N=57)	Two-wheeler retailers (N=33)	
Total food expenditure (₹)	27949 (12190)	24104 (6354)	25327 (11555)	30278 (8418)	27290 (11274)
Percentage of expenditure on					
Cereal and pulses	35.57	36.10	40.17	34.59	36.61
Fish	23.91	24.36	22.62	20.19	22.77
Milk and milk products	12.33	13.44	13.47	17.29	14.13
Meat/chicken/egg	5.27	5.35	4.28	9.40	6.07
Vegetables	9.46	9.16	9.41	9.37	9.35
Fruits	8.91	6.94	7.36	7.70	7.73
Eating outside	4.55	4.65	3.23	2.16	3.65
Total non-food expenditure (₹)	21585 (29585)	18979 (15012.69)	9994 (5575)	53163 (100589)	22746 (43406)
Percentage of expenditure on					
Education	50.83	42.35	30.86	70.62	48.67
Health care	27.04	36.09	28.86	17.07	27.26
Clothes	22.13	21.56	40.28	12.31	24.07
Total expenditure	49534 (32735)	43084 (17455)	35322 (16339)	83441 (102940)	50037 (46334)
Percentage of food expenditure in total expenditure	56.4	56.0	72.0	36.3	55.1
Percentage of non-food expenditure in total expenditure	43.6	44.0	28.3	64.0	45.0

Note: Figures within parentheses represent standard errors
Source: Survey Data 2010-11

compared to on cereals, pulses and fish. The fresh and dry fish-retailers spend annually 4.55 per cent and 4.65 per cent of their total food expenditure, respectively on eating outside.

The expenditure on education and health care together constitute around 76 per cent of the total non-food expenditure. The two-wheeler retailers incur proportionately less on health care and more on education than other categories of retailers. The dry fish-retailers spend around 36 per cent of their non-food expenditure on health care compared to 17 per cent by mobile men-retailers. Thus, in the absence of proper health insurance product, these women-retailers become much vulnerable to health risks. Overall the food expenditure constitutes 71 per cent among head loaders, whereas two-wheeler fish traders spend only 36 per cent, indicating gross difference in their socio-economic status. A higher share of food expenditure indicates that women head loaders tend to spend/invest less in education, health care, etc.

The relationship between expenditure and income of a family is positive. With rise in income, the proportion of income spent on food decreases and on non-food increases (Engel, l857). Thus, the income elasticity of demand is normally lower for food than for non-food items. Table 8 presents the basic relationship between annual income and expenditure on food and non-food commodities

Table 8 shows that in the lowest income bracket of ₹25,001-50,000, the food expenditure constituted 50 per cent of the total income, while in highest income bracket of more than ₹2,0 0,000, it was 18 per cent. The break-up of food expenditure across different income groups presented in Table 9 shows a significant difference, in income and food expenditure on different items, except in the case of cereals, fish and milk and milk products. Thus, we observe a shift in the consumption pattern of households with increase in income in respect of meat/chicken, vegetables, fruits and eating outside. It is interesting to observe that there is almost uniformity in the proportion of expenditure on fish in various income groups, which ranges between 22 and 24 per cent.

Table 8. Relationship between family income and total food and non-food expenditure

Annual income (₹)	Food expenditure (₹)	Non-food expenditure (₹)	Total expenditure (₹)
25001-50000	18802 (6337)	9204 (8874)	28007 (13436)
50001-75000	23799 (7920)	18777 (12313)	42576 (18297)
75001-100000	24796 (6630)	20888 (20246)	45684 (23280)
100001-150001	28777 (11144)	38142 (75611)	66918 (77720)
150001-200000	29853 (8053)	23280 (47520)	53133 (48768)
200001-250000	39622 (15581)	17747 (14964)	57370 (21616)
Overall	27290 (11274)	22746 (43406)	50037 (46334)

Note: Figures within the parentheses represent standard errors

Source: Survey Data 2010-11

Per Capita Annual Consumption of Food Commodities

The per capita annual consumption of food among the sample households in terms of quantity and value, is presented in Tables 10 and 11, respectively. Table 10 reveals that fish retailers consume about 52 kg of fish per capita per year, which is at least 5-times higher than the all India average of 9 kg/ year. In majority of the studies related to food consumption, meat/ chicken, eggs and dairy products occupy the second position (Kumar *et al*., 2005).

Like in other socio-economic indicators, we did not observe much difference in consumption pattern across the retailer categories. As per Table 11, the total value of fish consumption (imputed) was much higher than of items such as milk, fruits, vegetable and meat/ chicken/eggs. In terms of value, the fish occupied second position, next only to cereals among the fish retailers, which is the common consumption pattern in the coastal region. The value of per capita fish consumption constituted 23 per cent of the total food expenditure which is remarkably high. Further, it suggests that by involving small scale fish retail distribution system there could be more equitable spread in consumption, who otherwise would not buy fish from the market. Also, these communities spend a very low percentage of their total food expenditure on items like fruits and vegetables, etc.

Table 9. Relationship between income and food expenditure

Annual income (₹)	Total food expenditure (₹)	Percentage of expenditure on						
		Cereals and pulses	Fish	Milk and milk products	Meat/ chicken / egg	Vegetables	Fruits	Eating outside
25001-50000	18803 (6337)	40.80	22.15	14.22	4.38	8.66	6.64	3.15
50001-75000	23799 (7920)	37.19	23.14	15.4	4.52	8.80	7.65	3.30
75001-100000	24796 (6530)	35.97	21.87	16.77	5.13	8.87	7.81	3.58
100001-150001	28776 (11144)	35.90	23.62	14.18	5.33	9.15	8.03	3.79
150001-200000	29852 (8053)	35.84	23.70	11.71	5.68	9.66	8.58	4.83
200001-250000	39622 (15581)	31.72	23.69	9.03	9.32	11.26	9.30	5.68
Overall	27291 (11274)	36.24	23.03	13.55	5.73	9.40	8.00	4.05

Note: Figures within the parentheses represent standard error
Source: Survey Data 2010-11

Table 10. Per capita annual consumption of food commodities

(Quantity in kg)

Food commodities	Retail category				Overall
	Fixed point retailers		Mobile retailers		
	Fresh fish	Dry fish	Head loaders	Two-wheeler retailers	
Cereals and pulses	88.86 (22.95)	85.31 (28.71)	93.76 (17.91)	89.32 (22.53)	89.60 (22.59)
Fish	54.22 (13.50)	44.11 (17.34)	48.07 (19.49)	53.70 (7.51)	51.83 (15.19)
Milk and milk products	37.99 (11.91)	36.26 (15.86)	40.38 (15.42)	54.31 (24.14)	40.34 (15.91)
Meat/chicken/ egg	3.49 (3.18)	2.31 (2.53)	3.26 (3.45)	6.77 (5.22)	3.72 (3.65)
Vegetables	19.92 (10.52)	14.59 (8.12)	15.27 (10.36)	17.26 (9.73)	18.06 (10.36)
Fruits	12.61 (13.46)	5.97 (3.63)	7.52 (6.61)	10.71 (4.61)	10.69 (11.11)
Eating outside	3.41 (2.06)	3.55 (2.13)	3.06 (1.51)	3.31 (1.05)	3.38 (1.96)

Note: Figures with in the parentheses represent standard error
Source: Survey Data 2010-11

Table 11. Per capita annual consumption of food items

(Value in rupees)

Food items	Fish-retailers category				Overall
	Fixed point retailers		Mobile retailers		
	Fresh fish	Dry fish	Head loaders	Two-wheeler retailers	
Cereals and pulses	1827	1701	1880	1926	1838
	(965)	(604)	(317)	(481)	(782)
Fish	1295	1170	1174	1103	1233
	(458)	(428)	(417)	(248)	(430)
Milk and milk products	667	663	687	986	710
	(199)	(278)	(262)	(447)	(281)
Meat/chicken/egg	344	230	230	616	342
	(310)	(250)	(204)	(509)	(335)
Vegetables	523	412	425	500	488
	(335)	(209)	(191)	(225)	(288)
Fruits	524	348	379	462	469
	(300)	(157)	(173)	(185)	(263)
Eating outside	290	281	339	326	297
	(188)	(142)	(157)	(27)	(174)

Note: Figures within the parentheses represent standard error
Source: Survey Data 2010-11

Allocation of Hours to Different Activities

Distribution of hours by the fish-retailers was classified into four activities, viz. household, personal, economic and social, to represent the real time allocated by them to business and non-business activities. The study of allocation of working hours provides an insight into the possible opportunities to increase the working hours by shifting from the leisure. Further, such analysis also helps in understanding the latent under-employment present in the fisheries sector. The average daily hours spent on all these four activities are shown in Table 12.

Table 12 shows that fisher women retailers in general spend 11-13 hours on business compared to 9-10 hours by men retailers. Thus, the women retailers are not able to attend their traditional role in the family. The two-wheeler retailers by spending even least number of hours on business are able to have more income. It indicates that the access to transportation and good communication could positively influence their income and reduce the time spent on business activities.

Relationship between Income and Working Hours

Table 13 presents the analysis of time spent on different activities and income. It reveals that a marginal increase in the number of working hours leads to a substantial increase in their annual business income. Thus, there is a direct relationship between the number of hours spent on business activities and annual gross business income.

Empowerment in Decision-making Process

The women's ability to influence or make family decisions that affect their lives and future is one of the principal components of empowerment. Andrist (2008) has revealed that greater access to social capital provides fewer restrictions on women's autonomy. The fisher women in coastal Karnataka have liberty to take household decisions. Table 14 shows the role of women in decision-making at the family level with respect to their own marriage, employment, education of children, buying of assets, savings, credit and family expenditure.

Table 14 reveals that except in the case of their own marriages and buying of assets, the fisher women

Table 12. Allocation of hours to different activities

(No. of hours)

Activity	Fish-retailers categories				
	Fixed point retailers		Mobile retailers		Overall (N=268)
	Fresh fish (N=151)	Dry fish (N=27)	Head loaders (N=57)	Two-wheeler retailers (N=33)	
Household	2.62 (10.82)	3.11 (12.96)	2.92 (12.17)	3.64 (15.17)	3.07 (12.79)
Personal	7.57 (31.54)	8.78 (36.58)	8.84 (36.83)	9.64 (40.17)	8.71 (36.29)
Economic	12.64 (52.67)	11.10 (46.25)	10.68 (44.50)	9.55 (39.79)	10.99 (45.79)
Social	1.17 (4.88)	1.01 (4.21)	1.56 (6.50)	1.17 (4.87)	1.23 (5.13)

Note: Figures within the parentheses represent percentage
Source: Survey Data 2010-11

Table 13. Relationship between income and working hours of fish-retailers in coastal Karnataka

(No. of hours)

Annual income group of respondents (₹)	Activity			
	Household	Personal	Economic	Social
< 25000	2.75 (0.46)	8.63 (0.74)	11.50 (0.76)	1.29 (0.49)
25000-50000	2.87 (0.83)	8.80 (0.93)	11.03 (1.24)	1.44 (0.60)
50001-75000	2.65 (0.74)	8.92 (1.01)	11.21 (1.21)	1.53 (0.68)
75001-100000	2.46 (0.64)	8.42 (0.70)	12.23 (0.58)	1.20 (0.41)
Above 100000	2.00 (1.00)	7.70 (1.34)	12.60 (1.82)	1.70 (0.84)

Note: Figures within the parentheses represent standard error
Source: Survey Data 2010-11

Table 14. Empowerment of fisher women in decision-making process

Decision-making areas	Self	Husband	Jointly	Family members collectively	Parents	Father	Mother
Own marriage	24 (8.96)	0 (0.00)	5 (1.86)	29 (10.82)	166 (61.94)	12 (4.48)	32 (11.94)
Employment for self	108 (40.30)	12 (4.48)	43 (16.04)	39 (14.55)	18 (6.72)	0 (0.00)	48 (17.91)
Education of children	142 (52.98)	1 (0.40)	65 (24.25)	50 (18.65)	4 (1.49)	0 (0.00)	6 (2.23)
Buying of assets	57 (21.26)	1 (0.40)	63 (23.50)	125 (46.64)	6 (2.23)	0 (0.00)	16 (5.97)
Saving and credit	147 (54.86)	0 (0.00)	53 (19.77)	48 (17.91)	6 (2.24)	8 (2.98)	6 (2.24)
Expenditure (self and family)	131 (48.88)	2 (0.75)	54 (20.14)	49 (18.28)	20 (7.46)	0 (0.00)	12 (4.49)

Note: Figures within the parentheses represent percentage
Source: Survey Data 2010-11

have proved their ability in taking self-decisions. The women retailers not only decide themselves with regard to savings, credit and expenditure but also on education of their children and seeking employment. It indicates the impact of independent business on their empowerment in the decision-making process. Despite these empowerments, there are indications that fisher women are being adversely affected by mechanization and commercialization (Kurien, 1988) The women retailers have little say in the matters such as marriages, which indicates the presence of strong family system and social network in this area.

Conclusions

The study of socio-economic status of small-scale fish-retailers in coastal Karnataka has shown that women constitute a majority in this area in terms fixed point traders, dry fish-retailers, and head loaders (mobile), while only a small portion (12%) is represented by mobile (two-wheeler) men fish-retailers. The participation of women in fish marketing is unique in this area as in no other sector there is as much involvement of women as in this sector. The women dominate the fish retail marketing and have excellent skills and knowledge critical to product quality and thus market access**.** In small-scale fisheries, women receive and contribute a substantial part of the family income. The study has also found that, men-mobile counterparts spend less time on marketing and are able to earn 30-40 per cent higher income.

The consumption portfolio analysis has indicated that low consumption of milk and meat products by fisher women retailers is probably complemented with high consumption of fish and fish products by them. The actual nutritional impact of such consumption allocation needs to be assessed in future studies. The low educational level suggests that these fisher women get less opportunity to move out of their business and hence, the state policy to support modernization of fish marketing through the entry of modern retail stores should consider the social impact of such measures on these women groups.

References

Andrist, L. (2008) *Social Capital's Dark Side and Patriarchy in India.* Working Paper No.7. University of Maryland, Maryland.

Berkes, F., Mahon, R., McConney, P., Pollnac, R. and Pomeroy, R. (2001) *Managing Small-scale Fisheries: Alternative Directions and Methods*. International Development Research Centre, Ottawa, Canada.

Bhatta, R. and Bhat, M. (1998) Impacts of aquaculture on the management of estuaries in India. *Environmental Conservation*, **25**(2): 109-121.

Bhatta, R. (2000) An economic analysis of fishing operations in coastal Karnataka. *Journal of Social and Economic Development,* **2**(2): 329-347.

CMFRI (Central Marine Fisheries Research Institute). (2010) *Marine Fisheries Census 2005.* Cochin.

Engel, E. (1857) Die Productions- und Consumptionsverhaltnisse des Konigreichs Sachsen. Reprinted in Engel's Die Lebenskosten belgischer Atbeiter-Familien. Dresden, 1895.

GoI (Government of India) (2008) *Handbook on Fisheries Statistics*. Ministry of Agriculture, New Delhi.

GoK (Government of Karnataka) (2009) *General Family Income and Expenditure Survey*. Directorate of Economics and Statistics, Bangalore.

GoK (Government of Karnataka) (2010) *Karnataka at a Glance*. Directorate of Economics and Statistics, Bangalore.

Hapke, H.M. (2001a) Petty traders and development in a south Indian fishery. *Economic Geography,* **77**(3): 225-249.

Hapke, H.M. (2001b) Development, gender and household survival in Kerala. *Economic and Political Weekly,* **36**(13): 1095-1107.

Ibrahim, P. (1992) *Fisheries Development in India*. Classical Publishing Company, New Delhi.

Indian Institute of Management (1984) *Marketing of Fish in India.* Concept Publishing House, New Delhi.

Kumar, P., Dey, M.M. and Paraguas, F.J. (2005) Demand for fish by species in India: Three stage budgeting framework. *Agricultural Economics Research Review,* **18**(2): 167-186.

Kurien, J. (1988) *Studies on the Role of Fishermen's Organisation in Fisheries Management of Developing Countries***.** FAO Fisheries Technical Paper 300. Food and Agriculture Organization of the United Nations, Rome.

Kurien, J. (1991) *Ruining the Commons and Responses of the Commoners: Coastal Overfishing and Fishermen's Actions in Kerala State, India*. United Nations Research Institute for Social Development, Switzerland.

Kurien, J. (2005) *Responsible Fish Trade and Food Security*. FAO Fisheries Technical Paper, No. 456. Food and Agriculture Organization of United Nations, Rome.

Mahon, R. and McConney, P.A. (Eds) (2004) *Management of Large Pelagic Fisheries in CARICOM Countries.* FAO Fisheries Technical Paper. No. 464. Food and Agriculture Organization of the United Nations, Rome.

Manrique, J. and Jensen, H.H. (1998) Working women and expenditures on food away-from-home and at-home in Spain. *Journal of Agricultural Economics,* **49**(3): 321-333.

Murickan, J.S.J. (1983) Interlinkages of credit labour and marketing relations in traditional fishing: The case of Purakkad. In: *Fisheries Development in India,* Eds: U.K. Srivastava and D. Reddy. Concept Publishing Company, New Delhi. pp. 175-201.

Murthy, M. N. (1977) *Sampling theory and methods*. Culcutta: Statistical Publisher.

Nayak, N. (1986) *Impact of the Changing Pattern of Fish Vending by Women in the Fishing Community.* Programme for Community Organization, Trivandrum.

Platteau, J.P. (1984) The drive towards mechanization of small scale fisheries in Kerala; A study of the transformation process of traditional village societies. *Economic and Political weekly,* **19**: 65-103.

Teltscher, S. (1994) Small trade and the world economy: Informal vendors in Quito, Ecuador. *Economic Geography* **70**: 167-87.

Revised received: March, 2016; Accepted: July, 2016