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Transformation in Gender Roles with Changes in Traditional Fisheries in Kerala, India

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Abstract

In most food production systems technological changes, such as mechanisation, have often resulted in the displacement of women from their traditional roles. This paper looks at three different fisheries in the traditional sector in the central part of the state of Kerala, India and attempts to analyse the changes in gender roles. The ring seine fishery which was initially small scale, has now transformed into a capital intensive, high powered, labour intensive fishery with landings shifting from the beaches to the harbours. With the landings shifting to the harbours and becoming linked to the price incentives of the market, women have slowly been marginalised from marketing activity. The stake net fishery is generally practiced by the *Dheevara* community. Women are completely excluded from fishing operations and come into the picture only after the catch is landed. In the localised clam fishery, women were once actively involved in handpicking for the clams. But motorised canoes gave more scope for men and hence women were displaced. These changes, need fishery-specific interventions to give women greater access to the benefits of the fisheries.

Introduction

The impact of change can be positive, neutral or negative. In food production systems, changes can be induced by factors which could be technological, policy related, socio-cultural, political, legal and environmental. In most food production systems, technological changes such as mechanisation have often resulted in the displacement of women from their traditional roles in those systems (Subrahmanyam 1999). For instance mechanisation in agriculture resulted in improving food production by bringing in more area under cultivation, which was a positive effect of the change. However, the negative effect of the change with mechanisation was that the small farmers and women farmers could not take advantage of mechanisation, were deprived of the

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benefits of mechanisation and, as a result, had a diminished role in the sector. Mechanisation thus had a negative impact on the role of women in agriculture.

In the fisheries sector, fishermen have benefitted from the mechanisation of fishing craft by being able to go further and deeper into the seas and exploiting either unexploited areas or species of fish. The negative impact has been the over-exploitation of many common species of fish and many oceanic regions according to FAO (FAO 2012a). Another impact is the re-allocation of the roles of certain sections of the population traditionally dependent on the sector. A significant negative impact of deep sea fishing is that women traditionally participating in on-shore fishing were unable to explore the deeper areas of the seas and the oceans, unlike their male counterparts, due to physical limitations, safety concerns, lack of adequate knowledge of seamanship and navigation, and limited capacity to invest in financial resources required for deep-sea exploration. This has also resulted in another impact in the post-harvest activities in fisheries in that, with fishing activity shifting to harbours or becoming harbour-centric, the traditional beach-based post-harvest activity of women has decreased. However, the negative impacts spilling over from the changes may not be intentional. Many fishermen and fisherwomen may not have had coping strategies to meet the changes which had occurred to serve the burgeoning needs of the society.

Bearing in mind the lessons from agricultural mechanisation and our observations on the gendered consequences of the advent of deep sea fishing, this paper looks at three different fisheries in the traditional sector in the central part of the state of Kerala in India. We analyse the resultant changes in the gender roles.

The state of Kerala on the south-west coast of India has 10% of the country's coastline, and contributes 20% of India's marine fish production (Das et al. 2012). The state also contributes 40% to the seafood exports of the country. The state has a continental shelf of about 40,000 km^2, and has among the most productive waters in the Exclusive Economic Zone of India. There are 223 fishing villages with one million people depending on the marine resources and inland fishery resources for their livelihood. The number of fisherwomen in the state is 0.36 million (http://spb.kerala.gov.in/).

Materials and Methods

The framework

This study uses an indicative framework (Fig.1), which tracks, defines, and explains the transformations in the fisheries and aquaculture sector, and uses the components; technology development, policy formulation, environmental changes and development issues to explain the changes observed in three types of fisheries, namely the ring seine pelagic fishery, stake net fishery, and clam fishery. The framework was presented in the FAO Workshop on Future Directions for Gender in Aquaculture and Fisheries Action, Research and Development during the 3rd Global Symposium of Gender in Aquaculture and Fisheries in Shanghai, China during 23 to 24 April, 2011 (FAO 2012b). In the field of technology development, the components which would be used for examining the aspects of the direct and indirect impacts resulting from the changes in

the fisheries were: activity profile; resources – access and control; and institutional constraints and opportunities (Moser 1993). The activity profile includes questions such as who does what activity, and when and where the activity is performed. The access to resources and control of resources include questions such as what resources are available; who has access to which resources; and who has the over-all control of the resources. The institutional constraints and opportunities deal with policy and law.

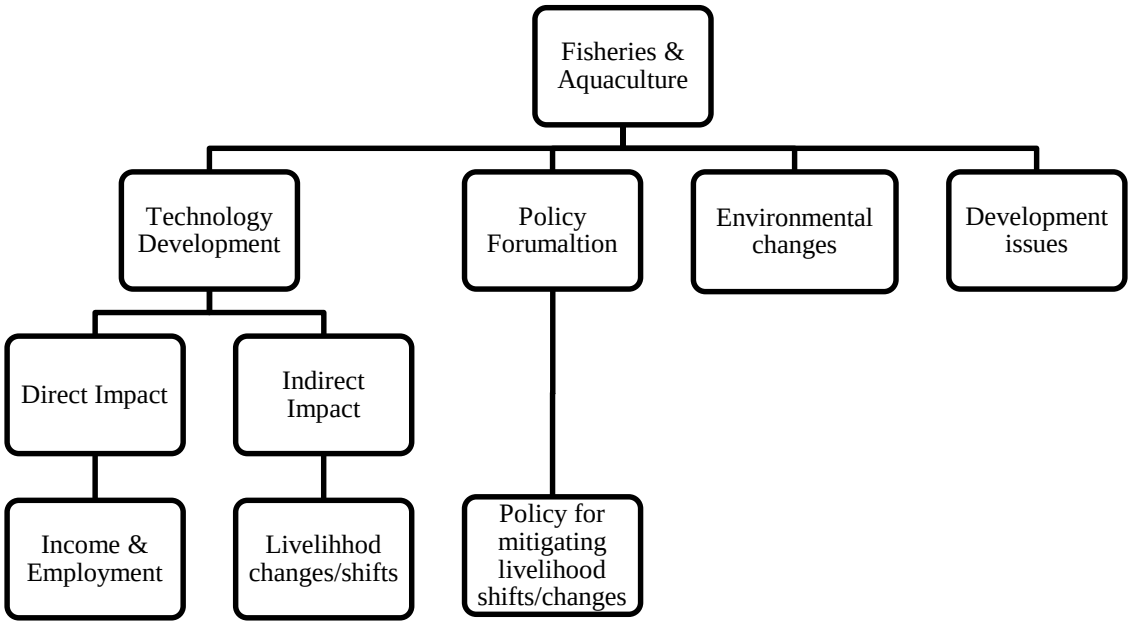

Fig. 1. Indicative Framework of transformation in gender roles with changes in the fisheries sector.

Source: FAO Fisheries and Aquaculture Report No. 998 FIRA/R998 (En) - Report of the FAO Workshop on Future Directions for Gender in Aquaculture and Fisheries: Action, Research and Development, Shanghai, China, 23–24 April 2011.

The indicative framework was used on the above mentioned fisheries described. The pelagic ring-seine fishery is coastal and the clam and stake net fisheries are inshore. All three fisheries studies are based in Ernakulum district of state Kerala. The ring seine pelagic fishery and the clam fishery changes deal with the direct impacts that resulted from changes with technology development, and the stake net fishery deals with the indirect impacts that resulted from changes with policy formulation and development issues in the sphere of livelihood changes and shifts.

Focus group discussions were used to study the scenario in ring seine sectors, while individual case studies were utilised in the clam and stake net sectors. In addition, relevant literature was reviewed to understand the developments in the concerned fields.

Results

The study indicates that there was and continues to be participation of women, in various degrees, in all the three fisheries. The results are presented separately for each fishery.

Ring-seine fishery

The ring seine fishery plays a significant role in the marine landings in the state with a contribution of 51.6% (CMFRI 2011) and operates along the entire coast of Kerala, except for the southern tip of the state. The ring seine is an encircling net, which was first designed and introduced by the Central Institute of Fisheries Technology, Cochin, in the mid-eighties for the traditional fishery as a new gear through the motorisation programme of traditional craft (Panicker et al. 1985). The adoption and popularisation of ring-seines (Balan and Sathianandan 2007) in the mid-eighties was the single most significant development in the post-motorisation of Kerala fisheries. The crafts using ring seines have grown enormously in size and their propulsion has changed from out board motors (OBMs) to in board motors (IBMs). The fishery has transformed into a capital intensive, high-powered, labour intensive fishery with landings shifting from the beaches to the harbours. The special feature of this fishery in Kerala is that the fleets are entirely operated by local fishermen, who mostly belong to the Latin Catholic community, with a unique traditional system of managing their fishing activity. This system regulates the work and wage sharing arrangements (Das et al. 2012).

There are two types of ownership of the fishing units, individual and collective. Individual ownership is for smaller crafts up to 12 m Length Over All (LOA), which are generally non-motorised or fitted with OBM. The average cost of the unit including vessel and engine ranges from INR. 50 lakh (USD 90,000) to INR. 60 lakh (USD 100,000). We also treat the ownership of a unit by a family as individual ownership. In larger units with the sizes of the craft and gear being bigger, the ownership is collective, with the unit being owned by a group of fishermen who are shareholders.

Women do not have any share in the ownership of the craft and gear in this sector. Women's traditional roles were in post-harvest activities, including sorting, marketing and processing the catch. During the early phase of development, the ring seiners were small scale beach landing crafts, possible because of the OBM engines fitted to them. This facilitated the active participation of women, who took over the post-harvest activities on the beaches and were actively engaged in sorting the catches and further marketing or processing. Since the crafts are now berthed in harbours, fishermen themselves have to travel from the fishing villages, leaving in the early hours of the day to reach the harbor from where the fishing trips begin. Women, who have to also manage household responsibilities, find it difficult to go to the landing centres and be there during the hours the landings take place, and thus, have been excluded from the marketing channel. The number of women engaged in marketing from this community has dwindled considerably (John 2009).

Stake net fishery

The stake net, known as *Oonnivala* in the Malayalam language, is very common in the backwaters of Kerala (Kurup et al.1993). It works using the fishing principle of filtering, and it can be effectively used where a strong current runs. The fishery is based on daily tidal conditions. The net is tied between stakes at the beginning of the tidal cycle, and is hauled just before the cycle

ends. The stake net is a non-selective gear. The stake net fishery is generally operated by people of the *Dheevara* community. The Government of Kerala, India brought different sub-castes of Hindu fishing communities under one section called *Dheevara* in 1984. It includes five sub-castes which are *Arayar, Mukkuva, Mogayira, Vala* and *Padanna* (Beegum 2007). *Dheevara* community has traditional rights over designated stake net fishing areas or regions in the backwaters, locally called *padus.* This type of fishing system is also seen in Tamil Nadu (Mathew 1991) and Sri Lanka (Amarasinghe 1997). The *padu* fishing is a traditional system of allocating rights to the fishing grounds to eligible fishermen in a fishing site (Rajagopalan 2012). The system defines the group of rights holders and resource boundaries and fishing sites. The *padu* system involves fishing site rotation which provides equal opportunity to prime fishing locations for all the eligible fishermen based on a lottery system. This system emerged as a response to change in markets and legislation in the 1970s. The average investment in the gear is about INR. 10,000 (USD 180), with each stake costing around INR. 5,000 (USD 90).

Each family may own one or more pairs of stakes between which they tie the net and conduct fishing operations. The *padu* system of fishing allows spatio-temporal regulation where fishermen are allowed access to specific fishing grounds by rotation, and all the eligible fishers can eventually access all fishing grounds. The work associated with the stake net fishery generally streches from the night to the early hours of the morning and is often back-breaking. In Kerala, inheritance of the *padus* has been through the male line, which is the same as in Tamil Nadu (Lobe and Berkes 2004), and it generally passes from the father to the son when the son attains 18 years of age. The membership rights are bestowed by the elderly persons of the village.

Women are completely excluded from fishing operations and come into the picture only after the catch is landed, when they are engaged in sorting the catch and later marketing them or drying the catch before marketing. There are religious rituals associated with setting up of the stake net and women are also not allowed to participate in these. Traditionally, if there were no male children in a family, the *padu* rights automatically reverted back to the system after the death of the fisherman in the family, and the widow or the female children were not entitled to such rights. Women-headed households could not even hire a labourer on wages to use fishing gear and craft – most often the fishing gear and craft had to be sold. On an average, women spent 4 to 5 h in sorting the catch before marketing is carried out. The marketing is still carried out by both men and women depending on the trading arrangements.

The one significant change that has taken place in the *Dheevara* community is that the traditional inheritance of the *padus* by women as dowry has slowly disappeared owing mainly to economic considerations over the last 25-30 years. With the fragmentation of families, there has been fragmentation of ownership of the *padus*. Almost around the same time, widows started taking over the stake nets of their husbands and leasing them out, in the absence of any other means of livelihood for the upkeep of the family. Ritualistic customs, however, still prevent women from handling the *padus* and touching them during certain times.

State legal issues have cropped up, with the fishery being classified as destructive. Stake nets, a non-selective gear, are mainly used to catch high valued prawns and hence the mesh size is

reduced to increase the catch which results in harvest of juvenile organisms. The operation of stake netting is mainly concentrated in and around bar mouths and this environment is also drawing the attention of conservationists (Vijayan et al. 2002). The estuarine fisheries of Kerala are regulated and managed by the Department of Fisheries according to the Travancore Fisheries Act, 1950. Further regulations were also promulgated for regulating and managing the use of stake nets (Mohamed et al. 2013) and this triggered a decline in the catch from stake nets. State interventions are also in place to phase out the fishery (http://www.newindianexpress.com/cities/kochi/Regulate-Use-of-Fishing-Gears-Stakenets-Says-Expert-Panel/2014/08/05/article2365220.ece). This is, however, being resisted by the fishermen for whom this has been a source of livelihood for generations. The stake net fishery is facing increasing competition from other fisheries as well as commercial and environmental interests. The increasing populations of new fishers seeking access to fishing rights in the region are putting a strain on the *padu* system (Rajagopalan 2012).

Clam fishery

The clam fishery of the state of Kerala is carried out in the backwaters, which the state is abundantly blessed with (Loveson and Sivalingam 2013). The backwaters have a unique ecosystem in which freshwater from the rivers meets the seawater from the Arabian Sea. The major species of clams found in these backwaters are *Meretrix casta* (Gmelin, 1791), *Paphia malabarica* (Chemnitz, 1782) and *Villorita cyprinoides* (Gray, 1825). The clam fishery is a localised fishery, which evolved basically to cater to the lime industry because the shells were more sought after than the clam meat. The fishermen are again from the *Dheevara* caste.

Harvesting of *Villorita cyprinoides* (black clams) continues throughout the year, and each fisherman harvests black clams about 20 days a month. A scoop net is used from a small canoe for the harvesting operation. The canoes are now mostly motorised, fitted with a small engine. They carry out the fishing standing on the canoe. Generally a single person is able to carry out the operation. Fishermen harvest in a different site almost every day. However, there is no harvest during stormy days in June and July.

Women do not actually harvest clams from canoes, but may use canoes to reach the harvest sites. Clam fishing is carried out by women by hand-picking, by standing in the waters about half-a-metre deep during the tides, and performing the time-consuming and prolonged labour-intensive work to identify regions of clam abundance in the water by using their feet. By hand picking, they can usually collect about two baskets of clam during the process. They remove the clay on the clams by rubbing them with their feet and then pick them with their hands and collect them in baskets made of aluminum or bamboo. A woman can harvest up to 6 $kg.day^{-1}$. They generally start the clam-picking process as early as 3.00 am by visiting the backwaters in their own canoes, and return with the harvest at 2.00 pm.

Clam processing is usually done in the fishermen's yards at home on the same afternoon as the harvest. Processing is carried out by the fisherwomen (Photo 1). The clams are put in large aluminium tubs with water obtained from the edge of the shore. The clams are boiled for about an

hour. When boiling causes the bivalve shells to open, the women pick out the meat, after lifting the boiled clams onto hand-held sieves or sieves hung between trees. The sieving activity is carried out by the women or by both the men and women. All of the clams are sieved by the afternoon and the clam meat is then washed in another sieve, and poured into aluminum tubs.

Photo 1. Women processing clam in homesteads.

The fisherwomen or fishermen either supply the meat to the traders or take it themselves to a local market to sell. In some instances fisherwomen also sell the clam meat within their local villages and save some for family consumption. If the processing is done during the afternoon, the marketing is carried out early in the evening. The wives of some fishermen begin the processing of clams by 3 am, and go to the market by 7 am, carrying the clams on their heads. Agents are also involved in sales of clam meats to retail food markets and large restaurants. The shells are sold through organised fishermen's societies to various industries because of their utility in manufacturing lime, poultry feed and other products. The harvest activity has almost become completely male-centric, with women now being restricted to processing and shucking of the clam meat and further marketing of the clam meat in wholesale and retail activities. The time analysis of fisher persons involved in the clam picking and processing activity has been presented in Table 1 (Gopal et al. 2011).

Clam fishermen are organised into professional societies. The fishing rights and licenses for harvesting are issued by the State Department of Mining and Geology to society members. Licenses are generally not issued to the wives of fishermen. The State government provides authority to male fishermen to gather juvenile clams from deeper waters and transplant them to shallow zones along the shores, where the women can wade at low tide and harvest them by hand. Lack of motorised canoes due to lack of credit, displaces women from the roles of harvesting

clams, hence, they harvest only low volumes when compared to male counterparts. There are no government regulations for the fishery except that juvenile clams should not be harvested.

Table 1. Time analysis in clam harvesting, processing and marketing.

Market	Timing/ Gender	4.00 to 6.00 am	6.00 to 8.00 am	8.00 to 10.00 am	10.00 am to 12.00 pm	12.00 to 2.00 pm	2.00 to 4.00 pm	4.00 to 6.00 pm	2.00 to 4.00 am
Morning Market	Men	Clam Picking							
	Women	Clam Processing	Clam Marketing						Clam Processing
Evening Market	Men	Clam Picking							
	Women			Clam Processing			Clam Marketing		

Source: Gopal et al. 2011.

However, there are on-going tensions between industrial and fisher groups with regards to clam shell mining. The excessive mining authority of the industries has resulted in damage to calm beds, damaging the ecology of clam habitat and thus affecting clam fisheries and the people dependent on them for their livelihood (Thomson 2009).

Discussion

During the 1960s, the beach landings from the ring seine fishery facilitated the active participation of women, who took over the post-harvest activities such as sorting the catches and further marketing and processing the fish. However, during the 1990's and after the advent of mechanised crafts, women became marginalised with little role to play. The landings were shifted to the harbours and became linked to price incentives of the market; women slowly became sidelined. Women who are still engaged in marketing frequent the harbours to purchase fish, but they have to face various types of hardships such as jostling for limited space, waiting for long hours for the crafts to land their catch and the auctioning process to complete, unless they are able to compete with bigger traders during auction. In many cases women do not participate in the auctioning process and buy fish from other wholesale traders. The other beach-based post-harvest activities such as handling the catch have been taken over by organised male labour.

Since the stake net fishery involves intense physical labour, women are not involved in harvesting operations. The catches in general have been declining and there is increasing pressure to abandon what had been a way of life for centuries. In this changing scenario, the need to protect *padus* from passing on to another family and in the process getting lost, is pre-empted by discontinuing the practice of women inheriting the *padus*. The fact that ownership transfer has not taken place for the past two generations may lead to social unrest if not resolved amicably. The *padu* system discriminates against women even on non-fishing rights such as drinking water and distribution of welfare schemes in natural disasters (Rajagopalan 2012).

Table 2. Indicative framework.

Factors and gendered impacts	**Ring-seine fishery**	**Stake net fishery**	**Clam fishery**
Technology Development	Increase in investment, size and power of fishing units.	Not much change in technology, still continues to be traditional methods of harvest.	Canoes for reaching collection grounds, canoes motorised with engines.
Direct Impact (income, employment)	Labour intensive; entirely male; landings shifted from beaches to harbours, women displaced from the postharvest activities on beaches like sorting and further marketing, women marginalised from the organised harbor based marketing channel.		Women restricted to processing and shucking of meat, marketing.
Indirect Impact(livelihood changes)	No share in the ownership of craft and gear for women; women marginalised in marketing and thus livelihoods impacted.		
Policy formulation		Changes in *padu* system-disappearance of traditional inheritance of *padus* by women, uncertainty regarding state policy, no tax collection, no records of ownership of stake nets.	State department of mining and geology issues fishing rights and harvesting licenses to males, state government provides authority to male fishermen to gather juveniles.
Impact of change		Women lose formal rights to inherit *padus*, uncertainty regarding state policies posing livelihood threat to dependents of the fishery.	Women not issued licenses and denied fishing rights.
Environmental change	-	Depleted resources, juvenile fishing, tying net at the beginning of high tide which is banned.	Clam beds destroyed by excessive mining industry, damage of ecology.
Impacts of change		State interventions to phase out fishery.	Tension between fisher and industrial groups, damage of clam beds affect the fisheries and dependents.
Development issues		Traditional ownership transfer has not taken place for past two generations, uncertainty regarding fishery as far as state policy is concerned.	
Impacts of change	-	The fishery has not shown any growth and is at a standstill.	

Harvesting of black clam continues throughout the year (Kripa et al. 2004). However, the fisherwomen involved in clam fisheries are still very poor and caught in a low income trap in spite of their long working hours and tedious, manual low technology efforts of collection, processing and sales of clams. Most women work single-handedly. The fishing which was done by diving and hand-picking was an activity women in the coastal areas had been actively engaged in. This affected the health of women in the fishery and many had problems such as backache, headache, myalgia, anaemia and difficulties in sight and hearing. In the clam fishery of Anjilikkad, Alappuzha district, Kerala, 52% of women are involved in carrying out all operations in capture, clam picking, processing and marketing (Sathiadas et al. 2004). Women also engage in clam harvesting in Ashtamudi Lake, Kollam district, Kerala, when they do not have work in nearby cashew factories (http://spo.nmfs.noaa.gov/mfr723/mfr7233.pdf). Although there is good export potential, they still depend on local markets for disposal of clam meat. Lack of credit coupled with low investment and low technology compels them to do this as a small scale family enterprise for their survival and sustenance. Market expansion and export promotion through value addition and product diversification may enhance the price, and thereby the income earning potential of these fisherwomen. Through suitable capacity building programmes in value-addition the livelihood options for the clam fisherwomen can be diversified (Sathiadas et al. 2004) and this can be backed by suitable institution support to improve their socio-economic conditions.

Conclusions

Women in the three fisheries sectors have been displaced out of several activities where they have been involved. In the ring seine sector, traditional post-harvest practices are no longer exclusive to women. The drudgery of life has increased for the women as they have to travel longer distances to reach harbours, wait for the catch to be landed, jostle to get a share, and in general spend longer hours than before in procuring and marketing the catch. In a similar way, the fishermen have to travel long distances to begin the fishing trips. With the social, economic and legal issues affecting the stake net fishery, women are still active in the post-harvest sorting activity, though again with high drudgery and their access to informal *padu* rights are precarious due to the stagnation in formal/traditional rights processes. In the clam fishery, women are marginalised in the harvesting sector due to their continued use of traditional methods of collecting clams rather than using motorised canoes for harvesting. They however, continue to process the harvested clam and are also involved in marketing.

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