Gender in Aquaculture and Fisheries: Engendering Security in Fisheries and Aquaculture
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Short Communication

Gender Roles Analysis of Ornamental Fish Enterprises in Maharashtra State, India

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Abstract

Ornamental fish breeding, rearing and production is an emerging business in India and has the opportunity for major growth, especially in domestic trade. In Maharashtra State, the Rainbow Revolution scheme was started in 2007. About 305 men and women are beneficiaries of this scheme. Gender role profiles of the ornamental fish producers are used to explore the differences between men and women's access to and control over resources in the ornamental fish enterprises in the northern coastal Maharashtra districts of Thane and Mumbai. Information was collected using semi-structured interviews and stakeholder meetings. Out of 90 farms, people on 30 farms were interviewed. The gender roles profile was studied using the Harvard analytical framework. The participation and time spent by men in the ornamental unit was significantly higher (8 hrs day^{-1} average) than that by the women (4 hrs day^{-1} average). Of the farms sampled, 22 units were owned by men and 8 by women, and men were found to have higher access and control over resources. Community norms, including the prevailing social hierarchy, demographic factors and the access to special training on ornamental fisheries were the major factors influencing people in taking up this venture. The study suggests that the role of women in ornamental fish production can be enhanced through targeted schemes for women with a focus on increasing ownership and training programmes. This will make the business more equitable and sustainable.

Introduction

The demand for ornamental fishes is increasing, especially in the United States of America (USA), Europe and Japan, stimulating many countries in Asia to start capturing and culturing ornamental fishes. Nearly 60 % of the international trade in ornamental fish originates from developing countries, mainly in Asia (FAO 2006). India's share in ornamental fish export is negligible

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and mainly dominated by wild varieties of fish from north eastern states. The domestic trade of aquarium fish is reported to be growing at 20 % annually (Jain and Jain, 2009). However, only 0.04 % of Indian households keep an aquarium as compared to 10-21 % in Europe and USA, indicating a major opportunity for growth of ornamental enterprise for domestic trade (Jain and Jain 2009). The 'Rainbow Revolution' scheme was initiated by the Marine Product Export Development Authority (MPEDA), Government of India in the year 2007 which aims to encourage breeding and rearing of ornamental fishes for domestic trade and export of fish. The scheme was implemented in 3 stages i.e. Grade I for cluster based rearing, Grade II for breeding and rearing and Grade III for breeding, rearing and export. The MPEDA has provided a 50 % subsidy for establishing ornamental units, along with 3 to 5 days training on ornamental fish breeding and rearing. The scheme was initially implemented in 4 states, i.e. Maharashtra, West Bengal, Tamilnadu and Rajasthan and later extended to other states.The business is being promoted amongst women's groups for livelihood security (Swain et al. 2013; Remeshan and Shaktivel 2014).

In India, approximately 1.8 million people are employed in net mending, marketing fish, peeling, curing, preservation, trading, purchasing, handling, drying, filleting, displaying, and fish-selling activities, with women forming 48 % of this total labour force (FAO 2011; Nag et al. 2012). Income earned by women contributes to the local economy, and in some areas it provides capital to male producers to improve their productive fisheries assets. In ornamental fish production in West Bengal, women do the feeding, collection of live food and selling of ornamental fishes to retailers (Ghosh et al. 2003). In Odisha, ornamental fish breeding and farming as a backyard activity has been taken up, especially in rural areas (Swain et al. 2011).

The success of women's self-help groups in ornamental fish enterprises has been related to the homestead status of the ornamental fish enterprises, and is enhanced through linkages with credit, technology, infrastructure, skill development and trade (Swain et al. 2013). Jayalal et al. (2016) also stressed the importance of finance and technology. Rameshan and Sakthivel (2014) found that ornamental fish enterprises can help women farmers to generate income and employment. The role of women in ornamental fish enterprises in India has been highlighted also by Shaleesha and Stanley (2000) and Dutta et al. (2013).

Men and women's access and control over the resources are essential to ensuring their right to equality and to an adequate standard of living. In many communities, gender disparities with regard to land and other productive resources are linked with assumptions that men, as heads of the households, control and manage productive resources. (UNHR 2013). Unequal access to resources limits women's capacity to ensure agricultural productivity, security of livelihoods and food security and is increasingly linked to poverty, migration and urbanization (United Nations 2011).

The present study had the objectives of understanding the differentiated contribution of women and men to the production and value addition within ornamental fish enterprises as well as how men and women might use and make decisions differently on the natural resources on which they depend for their livelihoods.

Materials and Methods

The study was carried out in the northern coastal districts of Maharashtra, namely, Mumbai and Thane. The primary data were collected through a semi-structured interview schedule and stakeholder meetings. The Marine Product Export Development Authority (MPEDA) records 90 fish producers in Mumbai and Thane. Out of these, 30 fish producers (22 men and 8 women) from all blocks from Mumbai and Thane district were selected randomly for the study.

To achieve the objectives of the study, the Harvard Analytical Framework given by Overhalt et al. (1985) was used. The Harvard Analytical Framework is a grid for collecting data at the micro-level (i.e., at the community and household level). The framework has 3 main components i.e., activity profile, access and control profile and influencing factors.

The non-parametric Mann-Whitney test statistic was used to test the difference between men and women's participation and time spent in various productive, reproductive and social-political activities. This test was used to compare differences between the independent groups when the dependent

variables are either ordinal or continuous but not normally distributed (Snedecor and Cochran 1967).

The null hypothesis was that there is no significant difference between men and women's participation.

Results

The study revealed that the majority of men and women involved in the ornamental fish business were middle-aged, college graduates. Ornamental fish farming was either a primary or a secondary occupation. Most of the units established in Mumbai and Thane have taken up the benefits of the 'Rainbow Revolution Scheme' implemented by MPEDA. Institutions such as the College of Fisheries, ICAR-Central Institute of Fisheries Education (CIFE) and MPEDA had motivated them. Their neighbors, friends and market potential, in order, were the other sources of influence. Almost all were members of a co-operative society and self-help groups.

Participation of men was higher in activities such as observation of fish health, water parameters, live food culture and maintenance, recording of parameters, setting of fish for breeding, preparation of tanks for rearing or breeding, recording of activity, preparation for marketing, packing of marketable fish, preparation and maintenance of filter system activities and marketing (Table 1). For women, participation was higher in activities like feeding, cleaning of tanks and siphoning feed preparation and removal of offspring. In addition, the majority of household work, collecting firewood, collecting water and agriculture and dairy work activities were done by women.

Men spent 8 hrs.day^{-1}on management of the ornamental fish production units, whereas women's involvement was reported to be 4 hours/day. Women spent most of their time, i.e. on average 11.5 hrs.d^{-1}, in household and community works (cooking, cleaning, caring, personal work and community works), whereas men spent 6.5 hours on these activities.

It is clear from table 2 that, there is a significant difference between men and women regarding participation as well as time spent in productive, reproductive and social and community activities.

Table1. Participation and time spent by men and women in different activities of ornamental fish production.

S.No	Activity Profile	Particpation (%)		Time Spent (hrs/ day)	
	Productive activities	***Men (n=30)***	***Women (n=30)***	***Men***	***Women***
	One time activity				
1	Construction of ornamental unit	100	33	-	-
2	Stocking of seed	87	70	-	-
	Daily activities				
1	Feeding	87	50	1.63	0.47
2	Cleaning of tanks and siphoning	73	50	0.77	0.57
3	Observation of fish health	87	33	0.77	0.22
4	Water parameter check	73	33	0.32	0.15
5	Feed preparation	73	60	0.72	0.68
6	Live food culture and maintenance	73	33	0.65	0.07
7	Recording of parameters	87	33	0.33	0.15
8	Setting of fish for breeding	87	53	0.27	0.20
9	Removal of fingerlings	87	50	0.21	0.16
10	Preparation of tanks for rearing or breeding	73	33	0.25	0.14
11	Recording of activity	87	43	0.25	0.14
12	Preparation for marketing	100	43	0.29	0.10
13	Packing of fish	87	43	0.25	0.08
14	Marketing	100	63	0.77	0.63
15	Preparation and maintenance of filter system	100	30	0.11	0.07
	Reproductive/Domestic activities	-	-	2.47	8.33
1	Household work	100	100	1.00	7.33
2	Other activities	90	60	1.47	1.00
	Social and community activities	-	-	4.1	3.1
1	Weddings	100	100	-	-
2	Funerals	100	100	-	-
3	Village meetings	100	40	-	-
4	SHG activities	100	63	-	-

Table2. Comparison between the men and women in participation and time spent for ornamental fish business and household activities. A significance level of 0.05 was selected.

Parameters	Z value	P-value	Decision
Participation	-4.654	0.000	Reject Ho
Time spent	-2.292	0.022	Reject Ho

In the study of access and control of men and women over resources, household, fishery related and financial resources were each examined. Household resource included land, farm, machine and equipment and other household assets. Fishery related resources included the ornamental fish units, breeding and rearing units, management of the units, production, marketing and income resources. Financial resources included income, expenditure, savings and credit.

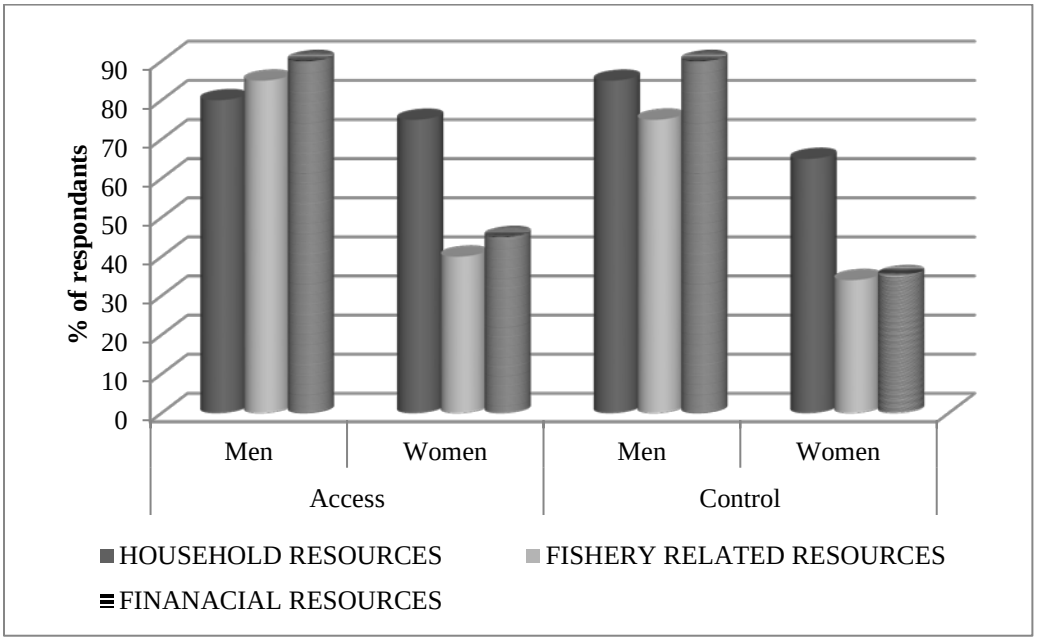

Fig. 1. Access and control over household, fishery related and financial resources between men and women

For all resources, men had greater access and control than women (Fig. 1). The women had considerably higher access to household resources and higher control over household resources than fishery related resources and financial resources.

Table 3. Access and control of men and women over household, fishery related and financial resources

Parameters	Z value	P-value	Decision
Access	-4.675	0.000	Reject Ho
Control	-4.559	0.000	Reject Ho

There is a significant difference between men and women's access and control over resources (Table 3). On an average, men have higher access to resources (87 %) compared to women (52.56 %). Men have higher control on resources (80.89 %) as compared to women (49.89 %).

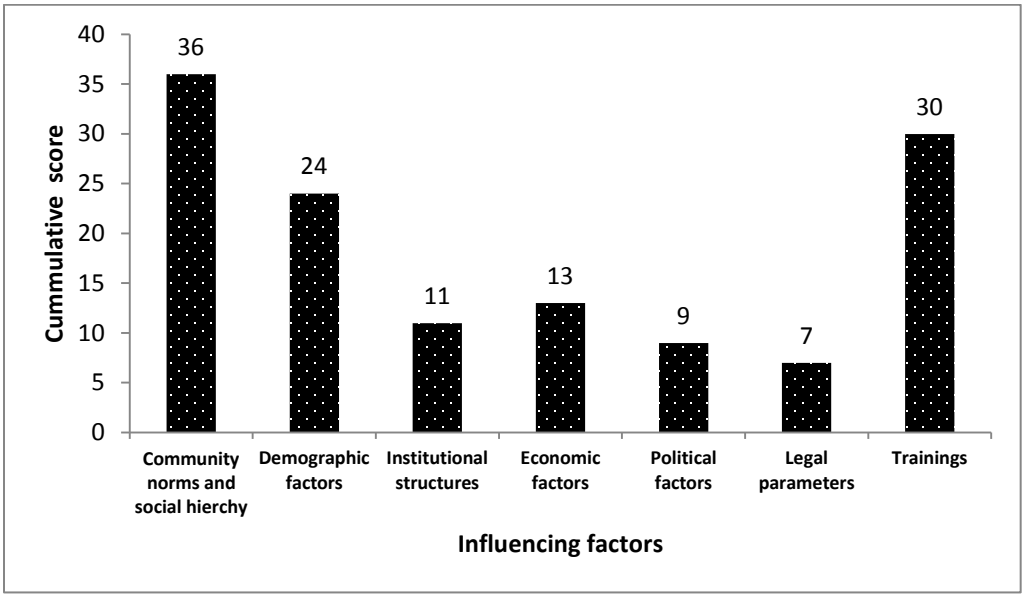

Fig. 2. Influencing factors affecting activity profile and access and control of resources

Among the influencing factors (Fig. 2), community norms and social hierarchy played the main role in deciding division of productive and reproductive roles as well as access and control of resources for men and women followed by training and demographic factors. Institutional structures, economic factors, political factors and legal parameters had relatively less influence.

Discussion and Conclusions

The maximum participation of men is in the construction of the ornamental fish unit, seed stocking, water and health check, live food preparation recording of activity. Women's participation was predominantly observed in feeding, cleaning of tanks and siphoning feed preparation and removal of offspring. There were notable differences between men and women in the access to and control over household, fishery and financial resources. Men had greater access and control over household, fishery and financial

resources when compared to women. Though women participated in fishery activities they had less access to and control over fishery resources when compared to men. The results obtained were similar to other studies which have also stated that men usually have more access and control over resources related to agriculture land, farm assets, inputs such as improved seeds, fertilizers and insecticides, management of labour, management of cash and procuring and repaying loan (Gupta 2011 and Paul 2016).

The main influencing factors were community norms and social hierarchy, training and demographical structures.

There is a vast opportunity for growth of ornamental fish enterprise in domestic trade. The gender role profile of ornamental fish producers reveal that even when the maximum ownership of the ornamental fish enterprise is with men, participation of women in the venture is significant. Women spent about 18 % of a day's time in the activities related to ornamental fisheries. In addition they spend 46 % of a day's time in the household work or reproductive roles. Men on the other hand spend 33 % of their day's time in the activities related to ornamental fish venture. Women are spending half of the time spent in comparison to men in this venture. It would be interesting to know whether the profit earned from the business is shared with women or not. As this study is recent, further results will shed some light on these features. From the initial field work it seems that women's ownership could be increased by having special schemes and training programmes for women in the field of ornamental fisheries. This will make the venture more equitable and sustainable.

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