

EMPOWERING WOMEN WITH AQUACULTURE KNOWLEDGE AND SKILL TO INCREASE FISH PRODUCTION

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ABSTRACT

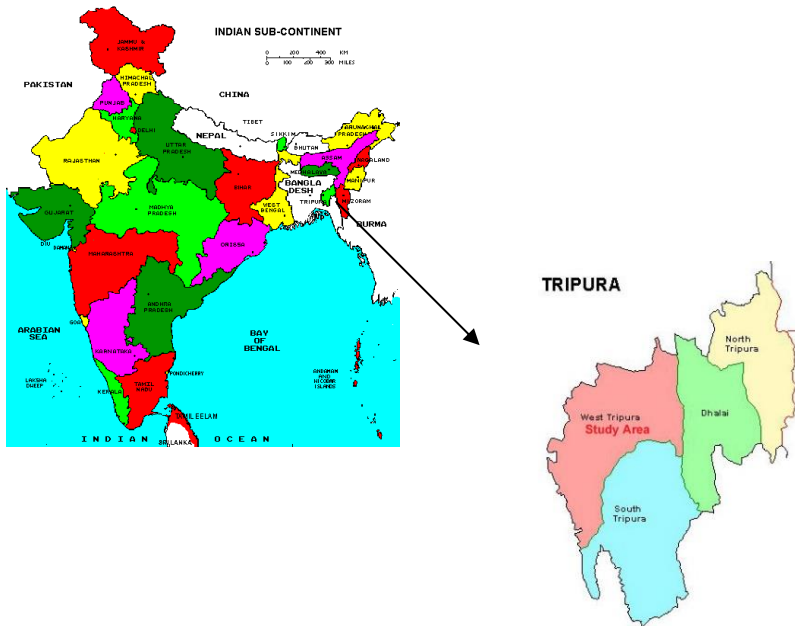
A survey to assess the participation of women in aquaculture conducted in Tripura state located on the Northeastern part of India, revealed that involvement of women in aquaculture activities increased fish production significantly. However, most women never attended any training, while the majority of the men received training. In most cases, men enriched with knowledge did not share the knowledge gained from training with their spouses. Considering the nature of aquaculture work, wherein women's involvement is expected to bring greater benefits, use of the 'family approach', involving both husband and wife to provide knowledge and skills in aquaculture is suggested.

Key words: *Tribal people; Bengali community; family approach; training; empowerment; gender.*

INTRODUCTION

Tripura state is located on the Northeastern part of India (Figure 1) and is culturally rich with nearly 31 percent of the population comprising tribal communities and the rest being Bengali and other communities. Ethnic conflict has hindered the state's growth for the past three or four decades. This problem is addressed through various strategies with focus on developmental programs in order to help people have better livelihoods. The economy of this state is primarily agrarian and contributes to 64% of the total employment in the state.

Rice and fish are the staple diets of the people. Women are known to be productive contributors to aquaculture productivity when they are empowered with aquaculture knowledge and skills (Kusakabe and Kelkar, 2001). Hence, the present study was undertaken to understand the level of participation of women in aquaculture as a basis for designing programs and policies that will help to empower women through aquaculture.

Fig. 1. Map of India showing the experimental area

METHODOLOGY:

Administratively Tripura is divided into 8 districts, 23 subdivisions, and these subdivisions are divided into 58 rural developmental blocks for administrative convenience. Each block has several grass roots level administrative set ups known as Gram Panchayats / Village Councils and these are 1176 in number. For the study, West Tripura was selected; the district has 9 blocks and 170 Gram Panchayats / Village Councils. Department of Fisheries maintains data on each village and this information was used to select the villages from each block. From each block, 25% of the total Gram Panchayats were selected based on the weighted average of three indicators viz., number of fish farmers (20% weight), pond area (30%) and productivity (50%). Based on this weighted average, Panchayats were ranked as best, medium and least performing categories. From each category an equal number of panchayats were selected. From the selected village, three percent of the total fish farmers or a minimum of 30 farmers were surveyed, whichever was more. Altogether data was collected from 996 families.

The collected data comprised 42.77 percent tribal and 57.23 percent non-tribal families. With a view to understand the role of women in tribal as well as non-tribal communities, the data was processed separately. However, in many cases, little difference was found and hence only the combined results are reported here. The data was analyzed using the SPSS program. Besides quantitative survey, focus group discussions were also conducted to understand the issues related to women participation.

RESULTS AND DISCUSSION

I. Socio-economic indicators

Family size, land holding, water area owned and income

The average family size was 5.79 persons with an average family land holding of 0.95 ha. Since a large part of the land is under forest cover and such areas are under government custody or community ownership, individual landholding is small in Tripura. However, large sized families need to intensify the agricultural activities in the small area of land owned and search for alternative employment opportunities to earn their livelihood. The average monthly per capita income is about US \$22. Nearly 30.3 percent of the families were found to be below the poverty line as per the Government classification. The Government provides subsidized rations and other facilities to those registered families below the poverty line. The average water area of the pond owned by the families was almost the same in both the tribal and non-tribal families and this large water area of about 900 m² provides good opportunity for the families to use these ponds to enhance their income through aquaculture (Table 1).

Assets owned by communities useful for aquaculture activities

More than 50 percent of the families owned television sets. Others owned either radio or tape recorder. Extension messages were effectively relayed through television and radio to the target groups. Bicycles and rickshaws were the common mode of transport used by most families. A small number of families also owned telephones, and mobile phones are becoming popular in rural areas. It is likely that in the immediate future, most families would use phones for speedy communication. In Northeast Thailand, aquaculture farmers were found to use the telephone to seek aquaculture information from friends and staff of the Department of Fisheries (Kusakabe et.al, 2003)

Food habits of people

Rice and fish are the staple diets of the majority of people in Tripura. Non-tribal farmers consumed almost double the amount of fish (22.6 kg/person/year), as compared to tribal farmers who consumed 10.6 kg/person/year. Fish is imported almost daily into Tripura. Hence, an objective of the state is to increase local fish production and to reduce or eliminate imports. Tribal families consumed dried fish at 0.16kg/person/year compared to non-tribal farmers consumption at 0.10kg/person/year. (Table 1).

FISH CULTURE ACTIVITY

Purpose of building fish pond

In Tripura, more than 100,000 farmers are involved in aquaculture (Anon., 2007). Ponds built for various purposes are used for fish culture. Seventy-three percent of the farmers indicated that they built ponds mainly for fish culture. Twenty percent of the farmers indicated that they built ponds mainly to store water for domestic purposes. The high rainfall in the region coupled with the proper renovation and reclamation of the existing ponds provide a great opportunity to increase fish production.

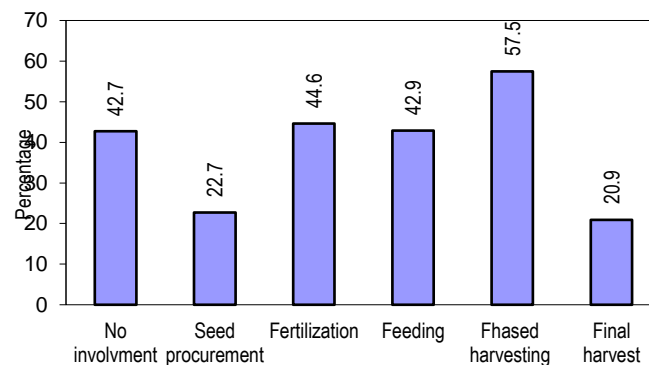
Fish productivity

The overall average productivity of fish was 1498 kg/ha/year compared to the production of 10,000 kg/ha/year in demonstration ponds. This low productivity was largely due to overstocking of fish seed, under fertilization of fish ponds and under feeding of fishes. Non-tribal farmers were found to better manage ponds and obtained higher production (1822 kg/ha/year) compared with tribal farmers production (1064 kg/ha/year). Hence, there is enormous scope to increase fish production by helping both tribal and non-tribal farmers obtain required aquaculture knowledge and skills.

Involvement of women in aquaculture activity

Women's participation in aquaculture activities was not common; still considered men's work by most women. Overall, 42.7 percent of women did not participate in any aquaculture activities; the rest of the women were involved in some. The most important activity was phased harvesting of fish for family consumption with 57.5 percent of women involved. Fertilization of fish was the next important activity carried out by women, and this was closely followed by feeding and seed procurement. Marketing of fish is not a traditional activity of women with only 5.31% of the women involved (Fig. 2).

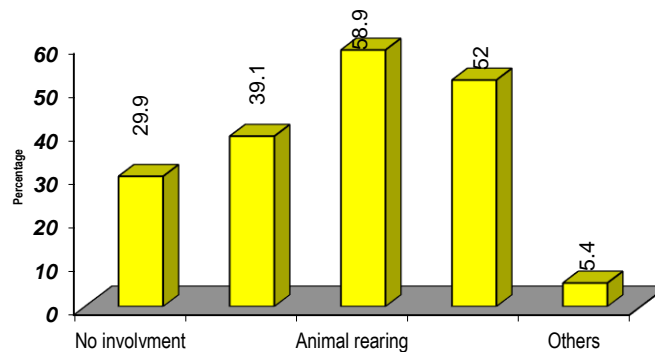
Fig 2: Involvement of women in different aquaculture activities



Involvement of women in various agricultural activities

Animal rearing was the most popular activity for women (Figure 3), followed by aquaculture then agriculture and vegetable cultivation. In addition, a few women were involved in weaving and other handicraft activities. Women involved in aquaculture activities did not carry out the activities independently and did not use the income earned from those activities to meet their personal and family necessities, unlike women involved in animal rearing and vegetable farming. Aquaculture is not yet considered an activity that can be easily managed by women as part of their domestic work. Since this activity is a high-income generating activity when managed properly, it is useful to empower women and encourage them to use aquaculture both as an income generating activity and to meet the family food requirements.

Fig 3: Percentage of Involvement of women in different economic activities other than household activities



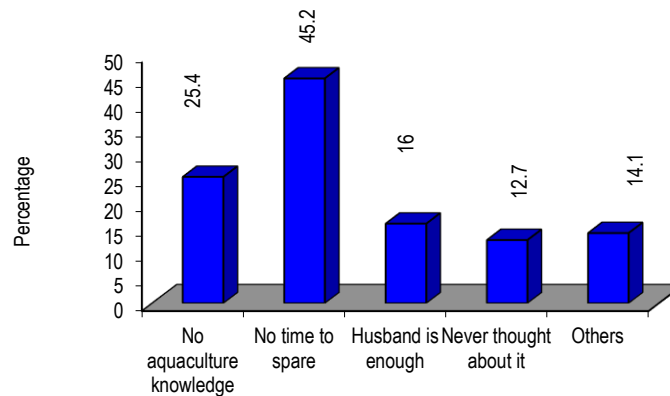
Reasons for non-involvement of women in aquaculture activity

When the women were queried on why they were not involved in aquaculture (Fig. 4), the most common answer from women was 'no time to spare' followed by 'no knowledge'. Some women also felt that their husbands can manage the activity by themselves. A few women believed, there was no tradition of women getting involved in aquaculture activity along with various other reasons like pond is too far, old age, poor health. An activity schedule indicates women were most engaged in carrying out household activities in both tribal and non-tribal communities.

Focus group discussion also revealed additional information on why women hesitate to participate in aquaculture activities. Many of them felt that it is an activity meant for men since often the person has to get into the water in the course of pond management. Considering the nature of work, particularly in terms of harvesting and marketing fish, many women felt that men being stronger, are more suited to the activity. Women also recognized the need to have more women field staff as it would help them to discuss aquaculture issues with them freely. In Bangladesh, CARE adopted

the strategy of appointing gender balanced field staff approach with positive effects in terms of empowering women with new skills (Debashish et.al., 2001)

Fig 4: Reasons reported by women for non-involvement in aquaculture



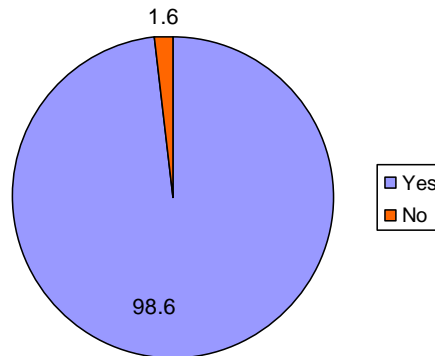
PROVISION OF AQUACULTURE KNOWLEDGE AND SKILLS TO WOMEN

Overall 1.4 percent of the women participated in the training. Among the tribal community who participated, the average productivity was 1232 kg/ha - higher than those who did not (1065 kg/ha). Among the non-tribal population, there was no major difference in production between those who attended the training and those who did not. It would be helpful, if the training is more practical oriented since the majority of women are illiterate.

When women were asked for the reasons why they could not attend the training, 80.8 percent of the women responded saying that they were not invited, 5.6 percent indicated that there is no time to spare, 7.6 percent remained silent and 6 percent had other reasons. In Cambodia, when similar problems cropped up, the family approach of inviting both husband and wife was adopted. Even after adopting such an approach, when many women with family commitments could not attend, training was arranged close to their homes and at a time convenient for them (Nandeesh et. al., 1994). Similarly in Bangladesh, the family approach was successful. Because of the cultural restrictions, separate learning sessions for men and women were arranged and female trainers were often used to train women participants (Debashish et.al., 2001)

When women were asked whether they will be interested to attend training if invited, 67.7 percent of women expressed interest. When other women were queried for the reasons for not being able to participate in the training (32.3%), large percent indicated lack of time as the main reason (48.9%). Old age (19%) was another important factor and a small percentage of woman also had no specific reason (15.3%). These reasons need to be taken in to consideration and evolve suitable strategies that will provide scope for larger participation of women.

Fig 5: Participation of women in aquaculture related training program

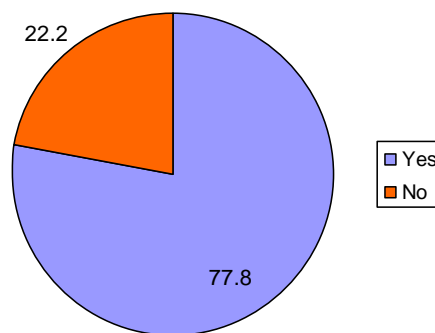


Participation of men in training programs and sharing of knowledge

Slightly over 84% of tribal men and 73.3% of non-tribal men attended the training (Fig 6). This reflects the State Government’s efforts to provide required knowledge and skills to people; but their effort so far has benefited men more than women. A minority of men shared the knowledge they gained in the training, with their communities (Table 2).

When men were asked whether they would encourage their wives to participate in training, over half said they would.

Fig 6: Participation of men in aquaculture related training program



DECISION MAKING PROCESS IN THE FAMILY

The majority of women said that decisions pertaining to aquaculture were made by men alone in both the tribal as well as non-tribal communities. In a few families, only women made the decision, but they were either from female headed households or the male members were engaged in other activities. In about 20 percent of the families, decisions were made jointly by both male and female

members of the family (Table 3). Unless women acquired aquaculture knowledge and skills, men in the family would not consult women in decision making.

On financial matter, in the case of tribal families, decisions were made jointly by the majority of the families, but less than half among non-tribal families. With regard to the overall decision-making process, 94 percent of the decisions were made jointly among tribal farmers, while in the case of non-tribal farmers, only 69.4% of the decisions were made jointly

Perception of women on their contribution to family economy

Only 2.3 percent of women felt that their contribution to the family income was high, but fifty-five percent of women felt that their contribution was low. This was largely due to the fact that women often do not view their household activity as an economic activity and only the income earned by engaging in income generating activity like vegetable cultivation, animal rearing, weaving, etc. are considered as income generating activities. It is important to note that as the men get involved in trading the fish harvested, the money was spent without consulting women. Considering the fact that fish culture is a reasonably simple activity, which can be carried out by women with appropriate knowledge and skill, there is need to focus on women. Once women are able to actively participate in the activity, they can gain gradual control of the income generated resulting in empowering women.

Impact of women participation in aquaculture on fish production

In general, when ponds were located within the homestead area, women observed their spouses implementing the aquaculture practices, then they too became involved in participating in some of the productive aquaculture activities. As a result of such participation, women's involvement had significantly positive impact as compared to their non-involvement (Table 4). This is most apparent when looking at the figures for non-tribal families. In a number of studies conducted in developing countries have shown that women's involvement in aquaculture always contributed positively for aquaculture development, particularly when women were empowered with knowledge and skills in aquaculture (Kusakabe and Kelkar, 2001).

Aquaculture being a new activity is yet to be integrated into the farming systems of the family and women in particular are yet to recognize that it is an activity that can be carried out by them. At present, women are not aware of the various types of resources available on the farm that can be effectively used to increase fish pond productivity without having to spend money on the purchase of inputs. As a result, they use rice bran and oil cake when purchased and available at home. Studies conducted in Cambodia have demonstrated that when women are given proper education, women have used various resources available on and off the farm to increase fish productivity (Nandeesh et.al.,1994). The northeast region with its rich biodiversity provides an excellent opportunity to develop low-cost aquaculture techniques.

CONCLUSION

The results of the present study demonstrate the potential benefits of imparting aquaculture knowledge and skills to women to increase fish production. Existing training approaches largely focus on training a person from the family and that, most often, happens to be the men in the family. Because of various constraints trainers often do not focus on gender balanced training approaches. Though in the present study we have not measured gender awareness, it is recognized that lack of gender awareness is one factor hindering gender balanced approaches in development activities. As the findings provide adequate evidence on women's interest in participating in aquaculture activities, suitable policies need to be developed to ensure targeting of both women and men in the family. A large percentage of women expressed interest to participate in training programmes and a majority of men expressed their willingness to allow their wives to participate.

The Department of Fisheries, Government of Tripura has recognized the need to focus on women and a number of strategies have been evolved to empower women. However, as the results of the present study demonstrate only very small percentage of women participated in training. The Department of Fisheries has agreed to place more emphasis on the family approach in their intervention strategies,

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Table 1: Socio-economic indicator of Fish farmer's family of West Tripura District

Indicators	(In percentage)		
	Tribal families	Non-tribal families	Overall
Number of families			
Average water area per family (in ha.)	0.09 (± 0.10)	0.09 (± 0.11)	0.09 (± 0.10)
Average family size	5.64 (± 2.09)	5.91 (± 2.58)	5.79 (± 2.38)
Average land holding (in ha.)	1.12 (± 1.13)	0.83 (± 0.86)	0.95 (± 0.99)
Per capita income	898 (± 747)	851 (± 773)	871 (± 762)
Below poverty line	38.90%	24.40%	30.30%
Per capita fish consumption (kg/year/person)	10.6 (± 12.0)	22.6 (± 14.6)	17.4 (± 14.8)
Per capita dry fish consumption (kg/year/person)	0.16 (± 0.10)	0.10 (± 0.09)	0.13 (± 0.10)
Fish production from cultured ponds (kg/ha/year)	1064 (± 890)	1822 (± 1381)	1498 (± 1253)
Assets owned by families that can benefit aquaculture (%)			
TV	50	67.2	59.9
Radio	32.7	22.9	27.1
By cycle	55.2	72.2	64.9
Scooter / Bike	8.4	11.8	10.4
Telephone	9.5	17.4	14.1

Table 2: Participation of men in aquaculture related training programmes

Particulars	(In percentage)		
	Tribal families	Non-tribal families	Overall
Participation of men in aquaculture related training programmes			
Training attended			
Yes	84.4	73.3	77.8
No	15.6	26.7	22.2
Percentage of people sharing the knowledge gained with their spouses			
Sharing of information with wife			
Yes	14.8	23.4	19.8
No	85.2	76.6	80.2
Perception of men about provision of training to women			
Women should participate in training			
Yes	65.3	75.2	71.2
No	34.7	24.8	28.8

Table 3: Decision making process on aquaculture, financial & family matters

(In percentage)

Decision made by	Tribal families			Non-tribal families			Overall		
	Aquaculture	Financial	Family	Aquaculture	Financial	Family	Aquaculture	Financial	Family
Male alone	81.1	12.6	3.4	70.6	46.7	26.3	75.4	31.1	15.9
Female alone	3.9	3.6	2.8	4.7	5.5	4.3	4.3	4.7	3.6
Jointly	15	83.7	94	24.6	47.7	69.4	20.2	64.2	80.5

Table 4: Impact of Woman involvement in different communities on fish production

Women involvement	Tribal families		Non-tribal families		Overall	
	Percentage of total	Average production/ha	Percentage of total	Average production/ha	Percentage of total	Average production/ha
Not involved	54.68	1054 ^a (±1027)	36.61	1650 ^a (±1275)	44.66	1325 ^a (±1183)
Involved	45.32	1106 ^a (±732)	63.39	1886 ^b (±1453)	55.34	1601 ^b (±1295)

Figures with same superscript are not significantly different