

Conservation Orientation about Fishes in Northern India

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ABSTRACT

Co-management, i.e. sharing responsibility for resource management between the government and user groups, is widely seen as a key to improving fisheries management and reducing over exploitation. Several factors may determine the success of any co-management policy or programme for conservation and sustainable management of resources. One such important factor is the kind of orientation that the resource users have about the conservation of their resources. Therefore, a study was undertaken at selected sites of three states namely, Himachal Pradesh, Madhya Pradesh and Uttar Pradesh to assess the conservation orientation of the members of fishing cooperative societies. A total of 580 fishermen who were members and 35 non-members of cooperative societies were taken as respondents. An index was prepared to measure the orientation of the members of the fishing cooperative societies towards conservation of fishery resources. The findings indicated that the overall conservation orientation of the members was high in HP and MP whereas, it was low in UP. Though the overall conservation orientation of the members at the selected sites of both HP and MP was higher, the sense of responsibility and sense of capability towards conservation was higher among the members at Tawa and Bergi reservoirs of MP.

Key words : *Co-management ; Resource management ; Fisheries management ;*

In the wake of several theoretical developments and policy changes in natural resource management, 'Co-management', defined as "an arrangement where responsibility for resource management is shared between the government and user groups", is widely seen as a key to improving fisheries management and reducing overexploitation (Jentoft 1989, Sen and Nielsen 1996, Pomeroy and Berkes 1997, Neiland and Béné 2003, Thomson 2006), reflecting a growing trend towards decentralized natural resource management (Ribot 2002). The main argument for co-management is that it can result in more efficient management, while allowing greater involvement of resource users in management decisions. Co-management is generally considered to be more democratic, have lower transaction costs and possibly be more sustainable than top-down management due to better communication and less conflict amongst participating stakeholders (Pinkerton 1989 and Nielsen et al. 2004).

It is believed that co-management arrangements are more suitable for facilitating conservation of resources. However, the degree to which any co-management policy or programme for conservation and sustainable management of resources can succeed, will depend, to a large extent, on several factors. One such important factor

is the kind of orientation that the resource users have about the conservation of their resources. How much users (fisherfolks) will cooperate and share the responsibility of conservation and management of their resources with the government agencies will depend upon different aspects of their orientation towards conservation. On the other hand, involvement of fisherfolks and their organizations in the management of resources may increase their conservation orientation positively. Further, when users are organized in the form of some organization, it is expected that their orientation towards conservation will be higher than those who are not organized (Singh and Ballabh 1997). The present study was undertaken at selected sites of three states namely, Himachal Pradesh, Madhya Pradesh and Uttar Pradesh with the following specific objectives:

1. To document the socio-economic profile of the members of fishing cooperative societies at selected locations.
2. To assess the conservation orientation of the members of fishing cooperative societies at selected locations.

MEHTODOLOGY

The study was undertaken at two sites each in H.P (a. Gobind Sagar and b. Pong reservoirs); M.P. (a. Tawa

and b. Bergi reservoirs) and U.P (a. Sultanpur, Faizabad, Jhansi and Lalitpur districts and b. Matatila reservoir). These locations were purposively selected because: (i) in H.P. the fishing cooperative societies were reported to be successfully functioning with active support of state fisheries department (Moorti and Chauhan 1997, Tyagi et.al 2008); (ii) in M.P, at Tawa reservoir, also reported to be successfully functioning with active support of a NGO which grew out of the rehabilitation problems of the tribals displaced by the Tawa Dam. (Jyotishi and Parthasarathy 2007, Tyagi et.al 2007); at Bergi reservoir, the fishing cooperative societies managed the fishery resources successfully for six years but its management was taken back and given to the state agencies by the government and (iii) in U.P, the fishing cooperative societies were not well developed. One more location (Matatila reservoir) was selected in U.P. where no cooperative society existed and fishing is done under contract basis. Thus, the U.P. sites could serve as a good control scenario to compare and see whether the conservation orientation of the member fisherfolks was different where functioning of the fishing cooperative societies was reportedly effective.

Finally, a total of 580 fishermen (10 members from each society) from the selected 11 fishing cooperative societies of Gobind Sagar reservoir, 9 societies of Pong reservoir, 10 of Tawa reservoir, 15 of Bergi reservoir, and 13 of small reservoirs/ riverine areas of UP were taken as respondents for this study. Besides, 35 fishermen fishing under the contract system at the Matatila reservoir of UP were also studied. The selected fishermen were personally interviewed with the help of a specially developed interview schedule during 2006-08.

Conservation orientation of the fishermen was operationalised in terms of their psychological inclination, opinion and commitment towards conservation. It consisted of 5 dimensions. An index was prepared to measure the orientation of the members of the fishing cooperative societies towards conservation of fishery resources. It consisted of 15 statements related to above 5 dimensions (3 statements for each dimension). Both negative and positive statements were included in the index. The opinion of fisherfolks was sought on a four point rating scale ranging from strongly agree to strongly disagree and scores 4, 3, 2, 1 were given for each positive statement. The scores were reversed in case of negative statements. Thus total score for each dimension could range 3-12, whereas overall score of a respondent could range 15-60. The responses were analysed using simple distribution statistics.

RESULTS AND DISCUSSION

Socio-economic profile of the members : The data pertaining to the socio-economic profile of the members of the selected sites are presented in Table 1. It is clear from the data that over two third of the respondents were middle aged. Majority of the respondents were educated at least up to primary level whereas, 25- 44 per cent of the respondents in HP and MP were educated up to middle level. In HP and MP sites, very few fishermen were illiterate. However, at the selected sites of UP, one third of the respondents were illiterate. Socio-economic status of the fishermen at all the selected locations was on the lower side (mean score 10.3–14.2 out of 27). Though majority of the respondents were in medium socio-economic category, however, one fourth of the respondents at Bergi reservoir (MP) and small reservoirs and riverine sites of UP and two third respondents of Matatila reservoir (UP) were in low socio-economic status category.

The extension contact and cosmopolite level of the respondents at HP sites was medium, however, the mean scores of respondents at MP and UP sites for these variables was very low. As far as the awareness and involvement of respondents in government schemes is concerned, it was medium at Gobind Sagar, Pong reservoirs (HP) and Bergi (MP) reservoirs, whereas, it was low at Tawa reservoir (MP) and sites of UP.

Conservation orientation : With the help of an index (as mentioned above) efforts were made to document and understand the orientation of the fishermen towards conservation. More specifically, it consisted of 5 dimensions viz. 1- Awareness which refers to the degree to which the fishermen are aware of the issues related to fish conservation. 2- Attitude which refers to the attitude of fishermen towards fish conservation and the importance they attach to it. 3- Interest referring to the interest and willingness of the fishermen for undertaking fish conservation measures. 4- Sense of responsibility which refers to the degree to which the fisherfolks perceive their responsibility and the responsibility of their organizations vis-à-vis the responsibility of the government agencies for undertaking fish conservation measures. 5- Sense of capability which refers to the degree to which the fishermen perceive that they and their organizations are capable of undertaking fish conservation measures on their own vis-à-vis the dependency they feel on the government agencies for fish conservation.

Table 1. Socio-economic profile of members of the fishing cooperative societies

Profile variable	Himachal Pradesh		Madhya Pradesh		Uttar Pradesh		
	Gobindsagar Reservoir N=110	Pong Reservoir N=90	Tawa Reservoir N=100	Bergi Reservoir N=150	Small Reservoirs Riverine N=130	Matatila (Non-members) N=35	
<i>Age</i>	Young	17 (15.4)	08 (9)	07 (07)	30 (20)	19 (15)	14 (40)
	Middle	77 (70)	67 (74)	69 (69)	98 (65)	92 (70)	16 (46)
	Old	16 (14.5)	15 (17)	24 (24)	22 (15)	19 (15)	5 (14)
	Av. Age (Yrs.)	46.4	42.1	44.5	40.5	42.37	38.5
<i>Education</i>	Illiterate	6 (5)	5 (6)	7 (7)	31 (21)	49 (37)	10 (29)
	Primary	52 (48)	35 (39)	57 (57)	68 (46)	41 (31)	19 (54)
	Middle	48 (44)	36 (40)	35 (35)	38 (25)	26 (20)	6 (17)
	Metric	3 (2)	11 (12)	1 (1)	8 (5)	7 (6)	0 (0)
	Above Metric	1 (1)	3 (3)	0 (0)	5 (3)	7(6)	0 (0)
<i>House Type</i>	Kuchha	82 (75)	59 (66)	69 (69)	98 (65)	70 (54)	25 (71)
	Mixed	24 (22)	31 (34)	31 (31)	48 (32)	52 (40)	10 (29)
	Pucca	4 (3)	0 (0)	0 (0)	4 (3)	8 (6)	0 (0)
<i>Socio-economic status</i>	Low	11 (10)	06 (7)	16 (16)	34 (23)	30 (23)	22 (63)
	Medium	83 (75.4)	71 (79)	77 (77)	105 (70)	92 (71)	13 (37)
	High	16 (14.5)	13 (14)	07 (07)	11 (7)	8 (6)	0 (0)
	Mean	13.6 [27]*	14.2 [27]*	12.2 [27]*	12.3 [27]*	11.5 [27]*	10.3 [27]*
<i>Extension contact</i>	Low	03 (3)	10 (11)	13 (13)	35 (23)	31 (24)	19 (54)
	Medium	77 (70)	58 (65)	77 (77)	96 (64)	73 (56)	14 (40)
	High	30 (27)	22 (24)	10 (10)	19 (13)	26 (20)	2 (6)
	Mean	8.0 # [16*]	7.1# [16*]	4.5 [16*]	5.5 [16*]	4.8 [16]	3.2 [16*]
<i>Cosmopolitaness</i>	Low	17 (16)	05 (6)	10 (10)	22 (15)	13 (10)	24 (68)
	Medium	77 (70)	76 (84)	80 (80)	108 (72)	103 (79)	10 (29)
	Highly positive	16 (15)	09 (10)	10 (10)	20 (13)	14 (11)	1 (3)
	Mean	9.1 # [11]*	7.7 # [11]*	4.4 [11]*	4.2 [11]*	7.2 [11]*	2.3 [11]*
<i>Awareness and involvement in govt. schemes</i>	Low	03 (3)	09 (10)	09 (9)	19 (13)	19 (15)	28 (80)
	Medium	83 (75)	68 (76)	85 (85)	98 (65)	94 (72)	7 (20)
	High	24 (22)	13 (14)	06 (06)	33 (22)	17 (13)	0 (0)
	Mean	8.5 [12*]	7.7 [12*]	5.9 [18*]	7.8 [18*]	6.5 [24*]	1.8 [24*]

Figures in parenthesis indicate percentage

* Maximum obtainable score

Significantly higher than fisherfolk members of fishing cooperative societies of MP and UP

Table 2. Overall Conservation Orientation of the members of fishing cooperative societies

Profile variable	Himachal Pradesh		Madhya Pradesh		Uttar Pradesh	
	Gobindsagar Reservoir N=110	Pong Reservoir N=90	Tawa Reservoir N=100	Bergi Reservoir N=150	Small Reservoirs Riverine N=130	Matatila (Non –members) N=35
Low	11 (10)	12 (13.5)	09 (09)	17 (11)	25 (19)	24 (68)
Medium	75 (68)	60 (66.5)	72 (72)	97 (64)	87 (67)	9 (26)
High	24 (22)	18 (20)	19 (19)	36 (24)	18 (14)	2 (6)
Mean*	46.1	46.0	45.6	47.3	36.2 #	22.5 #

Figures in parenthesis indicate percentage, * Possible score range was 15 - 60

Significantly lower than fisherfolk members of fishing cooperative societies of HP and MP

Overall conservation orientation of the fisherfolks at Gobindsagar and Pong (HP) and Tawa and Bergi (MP) reservoirs was on the higher side (mean score above 45 out of 60), whereas, it was low (mean score 36 out of 60) for members at the small reservoir and riverine sites of UP and it was very low (mean score 22.5 out of 60) at the Matatila reservoir (UP) where fisher folks were not members of cooperative societies (Table 2). Though majority of the respondents at most of the locations were in medium conservation orientation category, but greater portion of the respondents at the sites of UP were in low conservation orientation category.

The responses of the fisher folks on each of the individual dimension of the conservation orientation were also analyzed. Awareness of the conservation issues was high (mean score above 9 out of 12) at all the locations, except Matatila reservoir (UP) (Table 3). However, greater portion of the respondents at the sites of UP were in low awareness category. Attitude and interest of the

fisher folks towards conservation were high at HP and MP sites but they were low (mean scores 7.1 and 7.2) and very low (mean scores 5.1 and 5.2) at the small reservoir and riverine sites of UP and Matatila reservoir (UP), respectively. Similarly, the sense of responsibility and sense of capability of the fisher folks towards conservation were also high at HP and MP sites but they were very low at all the sites of UP (mean scores 6.8, 5.9, 4.7 and 4.2). Further, the data also indicate that about one fourth of the respondents at HP and MP sites had high awareness and attitude towards conservation, whereas very few respondents at all the sites had high sense of responsibility and sense of capability towards conservation. Another noteworthy trend brought out by the data is that at HP sites, mean scores for the dimensions, sense of responsibility and sense of capability towards conservation were slightly lower than the scores for awareness, attitude and interest towards conservation. However, this was not the case at MP sites.

Table 3. Orientation of the members of fishing cooperative societies towards different dimensions of Conservation Orientation

Components of Conservation Orientation		Himachal Pradesh		Madhya Pradesh		Uttar Pradesh	
		Gobindsagar Reservoir N=110	Pong Reservoir N=90	Tawa Reservoir N=100	Bergi Reservoir N=150	Small Reservoirs Riverine N=130	Matatila (Non-members) N=35
<i>Awareness</i>	Low	3 (3)	3 (3)	12 (12)	10 (6)	30 (23)	10 (29)
	Medium	80 (73)	72 (80)	57 (57)	103 (69)	76 (58)	20 (57)
	High	27 (24)	15 (17)	31 (31)	37 (25)	24 (19)	5 (14)
	Mean score*	9.9	9.7	9.4	9.9	9.2	6.3 #
<i>Attitude</i>	Low	18 (16)	17 (20)	18 (18)	12 (8)	27 (21)	12 (34)
	Medium	62 (66)	51 (56)	56 (56)	99 (66)	82 (63)	21 (60)
	High	20 (18)	22 (24)	26 (26)	39 (26)	21 (16)	2 (6)
	Mean score*	9.5	9.5	9.2	9.5	7.1 #	5.1 #
<i>Interest</i>	Low	14 (13)	20 (22)	20 (20)	15 (10)	10 (7)	15 (43)
	Medium	85 (77)	58 (65)	60 (60)	105 (70)	96 (74)	19 (54)
	High	11 (10)	12 (13)	20 (20)	30 (20)	24 (19)	1 (3)
	Mean score*	9.7	9.4	9.7	9.3	7.2 #	5.2 #
<i>Sense of Responsibility</i>	Low	11 (10)	20 (22)	22 (22)	15 (10)	43 (33)	14 (40)
	Medium	87 (79)	52 (58)	67 (67)	119 (79)	78 (60)	21 (60)
	High	12 (11)	18 (20)	11 (11)	16 (11)	9 (7)	0 (0)
	Mean score*	8.6	8.8	9.3	9.6	6.8 #	4.7 #
<i>Sense of Capability</i>	Low	11 (10)	9 (10)	10 (10)	25 (17)	40 (31)	14 (40)
	Medium	89 (81)	76 (84)	73 (73)	110 (73)	86 (66)	21 (60)
	High	10 (9)	5 (6)	17 (17)	15 (10)	4 (3)	0 (0)
	Mean score*	8.4	8.5	9.0	9.0	5.9 #	4.2 #

Figures in parenthesis indicate percentage;

* Possible score range for each of the dimension was 3 - 12

Significantly lower than fisherfolk members of fishing cooperative societies of HP and MP

CONCLUSION

The educational level and socio-economic status of the fisher folk members of the fishing cooperative societies at selected sites of HP i.e. Gobind Sagar and Pong reservoirs and MP i.e. Tawa and Bergi reservoirs were higher than the selected fisherfolks of UP. However, extension contact, cosmopolitanism and awareness and involvement of fisher folks in government schemes were lower in both MP and UP sites than the HP sites. It may be partly due to the lower socio-economic status of the fisher folks at these sites, but it may also be due to lack of extension efforts by the state fisheries departments and other agencies in MP and UP.

Overall conservation orientation of the fisher folk members was high in HP and MP. However, it was low in UP in both the cases, where fisher folks were members of the fishing cooperative societies and where they were not members and worked under the contract system. Higher conservation orientation of the fisher folk members

in HP might be partly due to their higher socio-economic status. However, this might largely be due to the fact that in HP, a system of cooperative management of these resources had been developed over last three decades (Tyagi et.al. 2008). Thus, effective functioning of fishing cooperative societies and greater efforts of the state fisheries department might have contributed towards higher conservation in HP.

Though the overall conservation orientation of the fisher folk members at the selected sites of both HP and MP was higher, the sense of responsibility and sense of capability towards conservation were higher among the fisherfolk members. It again might be attributed to their previous experience, willingness and eagerness to manage the fishery resources independently in their respective reservoir, whereas, in case of HP, the fishing cooperative societies work under the supervision and control of the state fisheries department in the management of fishery resources.

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