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Role of Community Institutions in Joint Forest Management

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ABSTRACT Forest is one of the most important resources for the very survival of human beings, especially those who are living in and around the forest. However, one of the major reasons for its depletion is unsustainable exploitation often by the same very people whose survival depends on the forests. Several attempts have been made in different countries to save this invaluable resource. Joint Forest Management (JFM) in India is one of such attempts which is characterised by active participation of the community institutions together with the Department of Forests. In this paper an attempt is made to discover the underlying institutional factors that enable or inhibit functioning of the Joint Forest Management Committees (JFMCs) and their effectiveness. Primary data were collected from 200 members of 63 JFMCs from four territorial forest divisions of Paschim Medinipur district of West Bengal. Apart from JFMC members, 19 forest department officials and staff were also interviewed to know about the performance of the JFMCs. Collected data were coded, assigned scores and analysis was done with the help of statistical package for social sciences (SPSS10.0) for windows. Results suggest that locally evolved institutional arrangements are major factors that contribute to JFMC functioning which is represented by gradations. Moreover, among various parameters of institutions, control mechanism plays the most significant role in influencing the functioning of JFMCs. Therefore, to assess the performance of JFMCs in a shortest possible time, review of control mechanism only will represent a fairly accurate picture.

INTRODUCTION

Forests are abode of numerous species of both plants and animals, which constitute biodiversity through a web of life. It supports various life forms including human beings who dwell in settlements in and around forests. However, they are under severe degradation and depletion the world over (Earth Summit Report, 1992).

Joint Forest Management (JFM) in India is an attempt to reverse the process of forest degradation on one hand, and to meet people's need on the other. It is an explorative initiative to bring together the Forest Department (FD) and the resource users - the forest community people (FC) through formation of Joint Forest Management Committee (JFMC). JFM is a unique approach which blends both scientific management techniques and age old indigenous practices to conserve forest on sustainable basis.

Adoption of JFM programme by the state governments and its relative success compared to earlier management options of forest resources have attracted national government and international donor agencies in promotion and development of the programme. It encourages one to look into the internal social and institutional dynamics of JFMCs and identify factors that enable or inhibit their functioning which ultimately determine their performances. The present paper attempts to study the institutional arrangements (IA) and its impact on the functioning of JFMCs, and contribution of individual parameters of IA on the functioning of JFMCs

MATERIAL AND METHODS

The study was carried out in Paschim Medinipur district of West Bengal, where JFMCs have been functioning for more than a decade. Keeping in mind the tenet of the JFM programme, data were collected from both JFMC members and the FD representatives. In total, 200 members were interviewed from 63 JFMCs from four territorial forest divisions of Paschim Medinipur district. Apart from JFMC members, FD officials and staff were also interviewed to know about the performance of the JFMCs. Altogether 19 FD representatives were interviewed, including Divisional Forest Officers, Range officers and Beat officers.

Collected data were coded, assigned scores and analysis was done with the help of statistical

package for social sciences (SPSS10.0) for windows.

RESULTS AND DISCUSSION

The West Bengal government order on JFM (Ref 4461-For. dated 12.07.89) stipulates series of activities for members of the JFMCs to facilitate forest conservation practice. Based on the degree of their success in those activities and on the basis of ecological parameters (Table 1), the forest officials classify and grade the JFMCs as A+, A. B+, B and C (Departmental Report to the Divisional Forest Officers sent by the Range Officers).

Table 1: Criterion for ranking of forest by FD

Rank	*Crown density*
A+	Above 0.8
A	0.61 - 0.8
B+	0.51 - 0.6
B	0.41 - 0.5
C	Below 0.4

Joint Forest Management Committees are "associations" (McIver and Page, 1950), of people constituted with a purpose to conserve forest resources and ensure its sustainable resource exploitation to meet people's needs in an equitable manner. This possibly is difficult to achieve without institutional and procedural details with regard to functioning of JFMCs.

Hence, Institutional arrangement (IA) is considered as one of the key factors which influences the functioning of JFMCs and its absence indicates to the contrary. In JFM programme, JFMCs enjoy specific benefits from a particular forest patch, in lieu of their responsibility to ensure effective conservation of forest resources. As a group, they influence individual members' behaviour towards conservation. Non-members are kept away from the forest patch totally or partially. This exclusion becomes essential to control and regulate pressure on the given forest patch. Otherwise the biotic pressure may lead to over-exploitation and weaken the collaborative effort (Vira 1999). Besides, individual members are always interested to enhance their personal benefit as much as possible by using the resource excessively without contributing to its generation. The problems have been dealt with by JFMCs by developing appropriate institution and socially sanctioned norms and procedures (McIver and Page, 1950) related to the decision-making process about access, use, and control of forest resources.

There are a number of studies (Roy, 1995; Sarin, 1996; Sivaramakrishnan, 1998; Vira, 1999; Das, 2003; Ravindranath and Sudha, 2004) which have dealt with institutional mechanisms in JFM. These studies tried to investigate under what kind of institutional arrangement JFMCs meet their objectives successfully and what are the factors that influence the functioning of JFMCs as institutions?

However, in most of the cases, IA refers to norms, rules and regulations which are locally made and implemented (Sarin, 1996; Roy, 1995). It is true that the rules formed and followed indicate members' level of proactiveness. However, knowledge of IA is not complete without studying the system of information sharing, monitoring and control mechanisms and conflict solving arrangements. Therefore, these aspects of the IA have been explored in the present paper, which present a comprehensive picture of the functioning of JFMCs. Table 2 shows the parameters and the constituent aspects of IA.

Rules Following (RF): The study looks into the rules followed by JFMC members (either evolved by them or told by the FD) to carry out various activities like patrolling of forest, control of forest fire and grazing, collection of non-timber forest produces (NTFPs) and arrangement of meetings. Only those rules are included in the study, which were in practice at the time of the study.

Monitoring Mechanism (MM): Rules, norms and procedures, even if they are developed by JFMCs, are not automatically followed by members, unless supervised by appropriate authority. Therefore, the paper explores the system adopted by JFMCs to monitor different activities and how far these rules are observed by their members.

Control Mechanism (CM): Monitoring is carried out with a purpose to control undesirable behaviours and promote those behaviours which are considered necessary. Well established system of reward and punishment helps members to understand what is expected of them. Keeping this in mind, the present study probed the control mechanisms and their practice in real situation.

System of Information Sharing (IS): Upward

Table 2: Institutional arrangements and constituent parameters

Factors	*Parameters*	*Constituent aspects*
Institutional Arrangement (IA) Computed based on 5 parameters and a total of 21 constituent aspects	Rules followed (RF)	Convene meetings, Patrol forest, Punish offenders, Control fire, Control grazing and Collect NTFPs
	Monitoring Mechanism (MM)	Resolutions taken in the meetings, Patrol activity, Illegal felling of trees, Grazing rules and rules for collection of NTFPs.
	Control Mechanism (CM)	With regard to Patrolling of forests, Illegal felling of trees and Grazing and collection of NTFPs.
	Information System (IS)	Convene meetings, Patrol forests, collection of NTFPs, Selection of labour
	Conflict Resolution mechanism (CR)	Issues of conflicts, Mechanisms to resolve conflicts

and downward flow of information not only indicates relationship among the members but also helps in effective functioning of the JFMC. The study examines the areas and methods of information sharing.

Apart from knowledge of the information sharing mechanism among the members of JFMCs, it also explores the same with neighbouring JFMCs, panchayats and the Forest Department.

Conflict Resolution Mechanism (CR): Conflict is inevitable in any social group. However, sustainability of groups depends upon its ability to manage conflict effectively. The nature of conflicts and mechanism to solve them signify cohesiveness, equity and ability of leaders to direct the group. In this paper, the issues of conflict among members and mechanisms to solve them have been examined.

Table 3 presents the results of the correlations that exist among the constituent parameters of IA as well as those with the dependent variable, i.e. gradations of JFMCs. In any correlation table, if any one or more constituent aspects have high correlation value, it implies that any one of them could be used for predicting performance of a given JFMC and therefore, considerable simplification of a regression model is possible.

Table 3 shows that the gradations of JFMCs

Table 3: Correlation of five constituting parameters of IA with gradation of JFMCs

	RF	*MM*	*CM*	*IS*	*CR*	*Grade*
RF	1					
MM	0.64	1				
CM	0.69	0.77	1			
IS	0.70	0.39	0.46	1		
CR	0.08	0.02	-0.00	-0.01	1	
Grade	0.80	0.77	0.82	0.64	0.043	1

are positively correlated with the RF, MM and CM score of the JFMCs. Among all the parameters of IA, the maximum correlation with gradation is obtained with the CM score (0.82), followed by RF (0.81) and MM (0.77). This shows that all the three parameters are more or less equally important aspects of the institutional arrangements of JFMCs. Highest correlation of CM (0.82) with the gradation of JFMCs indicates that usually, higher CM scores mean a high gradation and lower CM scores indicate low gradation of JFMCs.

Interestingly, scores of IS do not show as clear correlation with performance of JFMCs as that for RF, MM and CM. However, it shows a moderately high correlation (0.64) with the grades of JFMCs. It is seen that, while the JFMCs with structured method of IS has acquired higher score than informal information sharing system, the study shows that many a time the latter works better in a village society.

Among all the parameters under IA, CR shows the least correlation (0.04) with the gradation of JFMCs. The least correlation value of CR with the JFMC gradation contradicts the general assumption that less conflict and its effective management mechanism help in performing the groups better. The reason behind this apparent inconsistency might be the psychology of the respondents. It is well known that, conflict is inherent in any human group, and JFMCs are not exceptions. However, during data collection, it was observed that respondents are generally hesitant to express it in front of an outsider in the very first or second meetings. Moreover, in most of the cases it may not be present in an overt form and that is why, members do not feel its presence, and accept it as it is. Besides, JFMCs also develop some inbuilt mechanisms in the group to manage

conflict; nevertheless they are unable to explain it when enquired. Owing to these reasons, data on conflict could not reveal the true picture.

Further, the Table 3 shows that, IS has relatively low correlation value with MM (39%) and CM (47%). In the present study IS scores are calculated mainly on the basis of information sharing mechanism between the EC and the GB members regarding different rules and activities of JFMCs. Besides, information sharing mechanism between the JFMC and the BO has also been looked into. Therefore, high scores in IS only denotes organised effort to share information and not necessarily indicate members willingness to act on the basis of those information. For example, members may know about the rule of patrolling through written circular. However, this knowledge may not ensure their participation in forest patrolling. On the other hand, effective monitoring and control mechanism help members to follow rules and refrain from any deviation. This justifies the lower correlation value of IS with MM and CM.

Based on the above results, multiple regression analysis (Hair et al., 2003) has been used to assess whether the different parameters of IA, that have been studied, can actually explain the functioning of the JFMCs in terms of the gradation of forests done by the FD. Such investigations can provide valuable insights into the relative importance of the influencing aspects of JFMC functioning and can help in development of monitoring and capacity building programmes for JFMCs in the future.

Moreover, the analysis would also help to find out whether there exists a subset of the set of parameters studied, which can explain the variation in gradation accurately enough. Thus, these factors are considered sufficient only to assess the functioning of JFMCs and other factors can be ignored to simplify the regular monitoring process to assess the performance of JFMCs.

To examine this, first, a single factor simple regression model of IA has been built. Table 4 presents the results of the single factor regression model.

From the table 4, it is seen that in term of R^2 that, IA is the predominant factor with a value of 0.82. The result indicates that, IA can explain 82% of the functioning of JFMCs. It is also seen that the t-statistic for the estimated coefficient is significant at 0.05 level for IA. From the F-statistic, it is seen that the model is significant at 0.01 levels. The high value of the statistic shows that IA can explain most of the dependent variance. Based on the results obtained above, next multiple regression models are built in terms of the various parameters under IA in steps.

Table 5 illustrates that t statistic for the three parameters of RF, MM, and IS are significant at 0.05 level. On the other hand, for CM, it is significant at 0.01 level. Their coefficients are also of similar values. On the contrary, the coefficient of CR is not only of negligible value, it is also insignificant. These values indicate that among the parameters of IA, CM is the most important parameter for predicting functioning. Significance of other three parameters, excluding CR, is somewhat similar.

Table 4: Simple regression model of IA

Model	*Factor*	*B*	*SE B*	*b*	*R^2*	*Adjusted R^2*	*F*	*t*
1	IA	1.39	.08	.91	.82	.82	282.54***	16.81**

*** = significant at .01 level
** = significant at .05 level

Table 5: Summary of stepwise regression analysis of different parameters of IA

Factor	*B*	*SE B*	*b*	*R^2*	*R^2 Adjusted*	*t*	*F*	*R^2 Change*	*F Change*	*D F Change*
RF	.35	.14	.25	.83	.81	2.58**	55.61**	-	-	-
MM	.28	.09	.26			2.96**				
CM	.35	.09	.35			3.80***				
IS	.27	.10	.20			2.62**				
CR	.03	.09	.02			.34				

*** = significant at .01 level
** = significant at .05 level

From the standardised beta, it is seen that, all the four parameters contribute to explain the gradations of JFMCs. Among those, CM is somewhat predominant (.35), followed by MM (.26), RF (.25) and finally IS (.20). This is more or less consistent with the result of correlations presented in Table 3.

Based on these findings, finally, a multiple regression model has been built only with the parameters, which, are found (table 5) significant (according to t statistic) and have contributions (according to standardised beta value) to explain the functioning of JFMCs. The results of these are shown in table 6.

In the table 6, it is seen that, for the model including the significant parameters of IA, the three parameters of RF, MM, and IS are significant at 0.05 level while CM is significant at 0.01 level.

The standardised beta value reveals that all the four parameters have contributions to explain the gradations, although contribution of CM is the highest (.35) among them. RF and MM have similar contribution of .26. On the other hand, contribution of IS is .20. This is consistent with the observations of earlier correlations.

These results of multivariate regression analysis have shown and evaluated contributions of IA and their constituent parameters to explain the functioning of JFMCs in terms of their gradations. The corresponding values in the regression have indicated the relative importance of these parameters in terms of their contribution in explaining the gradations of JFMCs. Moreover, the statistical significance values indicate that the conclusions derived are very likely to hold over similar other data sets with a high probabi-lity.

CONCLUSION

Results suggest that locally evolved institutional arrangements are major factors that contribute to JFMC functioning which is represented by gradations. This finding also corroborates the earlier findings of Roy (1995) and Sarin (1996), where access and management rules of the JFMCs have been considered as the basis of effective functioning. Moreover, among various parameters of institutions, control mechanism plays the most significant role in influencing the functioning of JFMCs. It helps to maintain expected behaviours among members by reprimanding offenders and reward those who have done good work. Adherence to rules and regular monitoring are also important aspects of continuing functioning. Regular monitoring keeps members involved and enthusiastic and helps to identify their deviation from the established pattern of behaviour, if any. It further helps to justify existence of any rule at a given point of time. However, the result shows that, control mechanism is the most important aspect of institutional arrangements to assess functioning of JFMCs. Other parameters of institutional arrangements can be ignored to simplify the regular monitoring process to assess the performance of JFMCs in a shortest possible time.

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Table 6: Summary on regression analysis of significant parameters of IA

Factor	*B*	*SE B*	*b*	R^2	*Adjusted* R^2	*t*	*F*	R^2 *Change*	*F Change*	*Sig. F Change*
RF	.36	.13	.26	.83	.82	2.68**	70.56***	-	-	
MM	.28	.09	.26			2.99**				
CM	.35	.09	.35			3.81***				
IS	.27	.10	.20			2.61**				

*** = significant at .01 level
** = significant at .05 level

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