



Factors Affecting The Community Participation In Water Resource Management Development Programme And Aquaculture Management In Odisha As A Doctoral Study

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Abstract

The levels of participation in either of the NGO and GO implemented Water Resource Management areas are not satisfactory, because of some socio- cultural, economic, institutional and physical, technical factors. However, the NGO made Water Resource Management performed comparatively, well. In this regard, several variables are identified for determining the reasons for non-participation. Even though there have been many policy changes in the implementation of Water Resource Management programmes along with the decentralization of power and resource management, there is little awareness about the causes affecting the level and collective action to manage Water Resource Management resources. Under a diverse socio-economic condition, setting up any new institution and have people's involvement is a very challenging task. It is not easy to convince all the beneficiaries to participate within a given period. If the community participation is to be institutionalized, especially over the long run it is essential to rationally analysed the variables affecting community participation.

Introduction

As discussed in the previous chapter, the levels of participation in either of the NGO and GO implemented Water Resource Management areas are not satisfactory, because of some socio- cultural, economic, institutional and physical, technical factors. However, the NGO made Water Resource Management performed comparatively, well. In this regard, several variables are identified for determining the reasons for non-participation. Even though there have been many policy changes in the implementation of Water

Resource Management programmes alongwith the decentralization of power and resource management, there is little awareness about the causes affecting the level and collective action to manage Water Resource Management resources. Under a diverse socio-economic condition, setting up any new institution and have people's involvement is a very challenging task. It is not easy to convince all the beneficiaries to participate within a given period. If the community participation is to be institutionalized, especially over the long run it is essential to rationally analysed the variables affecting community participation.

In the present study based on the literature review and beneficiaries' perception, the variables are selected which influence the participation. The descriptive statistics method is used to identify the average response (mean value) regarding the average influence of each variable. Further, the factors and regression analysis is found to be appropriate to consider the influence of independent factors (socio-cultural, economic, intuitional and physical and technical) on dependent factors (community participation).

Descriptive statistics of participation variables

Table 4.1 and 4.2 reports the average collective response of Water Resource Management beneficiaries about their participation. Descriptive statistics summarizes the data in a meaningful and suitable way using quantitative analysis. Descriptive statistics helps in the interpretation of raw data in a more straightforward and precise manner. The mean value shows in Table, 4.1 and 4.2, mainly represents the mean and standard deviation the each variable included in the study. The mean values of the variables show their impact ranking. The value of each variable identifies the influence of that variable on the participation.

Review of Literature

But the privatisation of natural resources may not always give the desired results. It was argued by Bromley & Cernea (1989) that the privatisation of CPR ensures the right to a limited group while excluding the rights of the majority of the others. Criticizing the privatization, Wade (1988) was of the opinion that imposing the regulation externally, is not a necessary condition for the use and management of commons. He argued that the privatisation of resources or government control over the commons breakdown the local management institutions, whereas shared property rights can strengthen collective action among the user groups. Olson (1971) supported the view that neither privatization nor centralization or nationalization of the CPR solves the problem of degradation completely. She also admitted that in some cases the privatization and centralization have facilitated the efficient use of CPR. She stated that some small groups can organize themselves for the collective action to manage the CPRs.

Olson is optimistic about the small groups, and they can organize themselves with collective goods without depending on any other external force, positive incentives, except the collective good itself. This happens because in a small group the members attain the personal benefits. The achieved benefit from the collective action is more than the total costs that they have to make to produce the collective action. In addition to this, each member knows that acting collectively is more beneficial than individually. Another theoretical approach to analyse collective action used by the researchers and policy makers is the 'Prisoner's Dilemma of Game Theory' (Rasmussen & Meinzen Dick, 1995). This theory attempted to answer the question,

whether or not people will choose cooperation and organise themselves to cooperate with each other voluntarily. Prisoner's dilemma analysis is applied to common property management, where there are many individual either to cooperate or defect for personal interest. The pieces of evidence show that the rational choice of each will instigate him / her to take a free ride at the cost of others, finally leading to what Hardin told as 'tragedy of the common'. The structure and payoff of prisoner's dilemma game are often criticized as highly artificial, as it may not always represent the real life situation faced by individuals in most natural resource management situations.

Research Methodology

Post Facto Research Design have been used in this Research. The author is a Subject Matter Specialist-Fisheries under ECRICC project of Dept. of Forest & Environment, Govt of Odisha. He has done his PhD by Research in regular mode from his day to day work and research by affiliating with LIUTEBM University. Earlier he was working under Odisha Livelihoods Mission.

Community participation in different phases of Water Resource Management

Variable one stands for the community participation in various phases of the Water Resource Management project (Table.4.1 and 4.2). Participation has become essential to make Water Resource Management development programme successful. However, variations in community participation are found in different phases of the Water Resource Management project (from pre- planning, planning, implementation, post-implementation and participation in meetings and decision-making). To involve the community in pre-planning and post implementation phase of Water Resource Management is the biggest challenge for the Planning Implementation Agency (PIA). The participation in pre-planning phase is found to be less as it needs serious efforts of PIA to involve the community (discussed in detail in third chapter). In initial phase of implementation of Water Resource Management project people are not very much interested to participate. As they are in dilemma whether they are going to get any benefit or not.

In post implementation phase the number of Water Resource Management meetings are less therefore community participation is affected. The table (4.1) and (4.2) shows that, the mean value of pre-planning and post implementation phase of Water Resource Management project is 4.06 and 4.09 in NGO implemented and GO implemented Water Resource Management, respectively. The mean value of variable post-implementation of NGO and GO implemented Water Resource Managements are 4.46 and 4.47 respectively. Apart from different phases of the Water Resource Management implementation project, two crucial activities in which they participate are Water Resource Management meetings and decision-making process. In NGO implemented Water Resource Management area, the mean = 4.46 is associated with the participation in meetings and mean value = 4.40 with decision-making participation. While in case of GO implemented Water Resource Management, the mean value of participation in meeting is 4.30 and mean value of decision making is 4.20.

Socio-cultural variables

Variable two stands for the perception of NGO and GO implemented Water Resource Management beneficiaries towards the socio-cultural variables that influence their participation (Table 4.1, 4.2). The mean and standard deviations in beneficiaries' responses towards many socio-cultural drivers of participation in the Water Resource Management project are analysed. In NGO implemented Water Resource Management areas, conflict (variable) among different stakeholders has been perceived as the most significant variable of participation in the Water Resource Management project (mean = 4.29). Awareness of the Water Resource Management programme follows this with a mean value of 4.28. In case of GO implemented Water Resource Management both the variables, conflict (mean = 4.28) and awareness (mean value = 4.28) are found to be important determinants of participation.

Institutional variables

The institutional variables influencing the participation in Water Resource Management programme are associated with implementing agency (NGO or Government), property rights (whether private, central, state and common property regime), natural resource treatment works (like soil and water conservation activities, contour bunding, check dams, farm ponds, village pasture land.), level of participation in previous rural development project, the size of Water Resource Management user groups, trust and misconception or no clarity over the meaning of participation among the external agents. The beneficiaries' perceptions about the institutional factors affecting participation in Water Resource Management development programme are presented in Tables 4.1 and 4.2. In NGO made Water Resource Management the variables, type of PIA (mean = 4.19) and property rights (mean = 4.15) were found to be the significant variables influencing the participation. However, in GO implemented Water Resource Management, the variable, type of PIA (mean = 4.25) was found to be significant followed by variable property rights (mean = 3.83).

Economic variables

The economic benefit is one of the manifested outcomes of any Water Resource Management project that is why it is viewed as an important variable that may have a direct impact on participation. The leading economic variables of community participation in the Water Resource Management project include livelihood sources, equal distribution of Water Resource Management project benefits, poverty and market linkages. It is observed that livelihood is the important economic variable with the mean score of 4.03, in NGO and 4.04 in GO implemented Water Resource Managements.

Physical and technical variables

The result of descriptive statistics depict that, among all the studied variables the physical and technical variables have a comparatively minor impact on participation. However, it was found that the interaction with the technical officials and other PIA officials is one of the critical variables that affect the participation. This variable secured the highest ranking (mean = 3.93 in NGO and mean = 3.95 in GO implemented Water Resource Management).

After the descriptive statistics analysis, the reliability test was carried out to measure the internal consistency

of the scale. For this purpose, Cronbach alpha coefficient was used. A value greater than 0.7 for Cronbach alpha (coefficient α) is used to ensure the internal consistency. Then the factor analysis is conducted to detect and remove the highly correlated variables from the empirical data and to restrict the variables within a certain number of groups.

Table 4.1: Descriptive statistics of participation variables(NGO implemented Water Resource Management area)

Sl no.	Variables	Mean	Std. Deviation	Number of households
1	(V1) Participated in pre-planning phase	4.06	1.004	167
	(V2) Participation in planning phase	4.32	.761	167
	(V3) Participation in implementation phase	4.46	.674	167
	(V4) Participation in post implementation phase	4.46	.628	167
	(V5) Participation in meetings	4.46	.751	167
	(V6) Participation in decision making in Water Resource Management activities	4.40	.757	167
	(V7) Participation in maintaining the Water Resource Management structures	4.43	.749	167
2	(V8) Conflict among differ stakeholders (between PIA and beneficiaries or between land holders and landless)	4.29	.739	167
	(V9) Awareness about the Water Resource Management programme	4.28	.735	167
	(V10) Promotion of traditional and historical practices devised by local communities to conserve the natural resources	3.69	1.170	167
	(V11) Gender of the Water Resource Management beneficiaries	3.89	1.141	167
	(V12) Village politics	3.29	.856	167
	(V13) Power differential among the different cast and class people	3.72	1.085	167
	(V14) Level of social solidarity among the beneficiaries	3.67	1.205	167
	(V15) Heterogeneity in terms of cast and land holding	3.64	1.272	167
	(V16) Local leadership to mobilize the community for participation	3.49	1.251	167
	(V17) Illiteracy of the beneficiaries	3.59	1.267	167
3	(V18) Type of planning implementing agency (PIA) of Water Resource Management Project	4.19	.882	167
	(V19) Property rights over the Water Resource Management resources	4.15	.750	167
	(V20) Natural resource treatment work under taken during the implementation of Water Resource Management project	3.90	1.209	167
	(V21) Water availability	3.68	.701	167
	(V22) Level of people's participation in previous project	3.82	1.142	167
	(V23) The size of Water Resource Management user group	3.81	1.124	167

	(V24) Trust between PIA and communities	3.77	1.216	167
	(V25) Misconception over the meaning of Participation	3.93	1.183	167
4	(V26) Sustainability of livelihoods provided by the Water Resource Management	4.03	1.174	167
	(V27) Unequal distribution of the benefits by	3.87	1.037	167
	Water Resource Management to landless and land owning households			
	(V28) Poverty of the beneficiaries	3.84	1.032	167
	(V29) Number of family members working	3.35	1.026	167
	(V30) Good market linkages to sell the agricultural products	3.74	1.163	167
5	(V31) Land tenure system, whether it is temporary or permanent land Ownership	3.83	1.024	167
	(V32) Interaction with the technical officials and other PIA officials	3.93	1.154	167
	(V33) The percentage of land under village commons or open access	3.89	1.227	167
	(V34) The available infrastructure to access the Water Resource Management resources	3.72	1.101	167
	(V35) Environmental condition	3.69	1.312	167

Table 4.2: Descriptive statistics of participation variables(GO implemented Water Resource Management area)

Sl no.	Variables	Mean	Std. Deviation	Number of households
1	(V1) Participation in pre-planning phase	4.09	.993	236
	(V2) Participation in planning phase	4.28	.853	236
	(V3) Participation in implementation phase	4.49	.655	236
	(V4) Participation in post implementation phase	4.47	.686	236
	(V5) Participation in meetings	4.30	.740	236
	(V6) Participation in decision making in Water Resource Management activities	4.20	.750	236
	(V7) Participation in maintaining the Water Resource Management structures	4.30	.687	236
2	(V8) Conflict among differ stakeholders (between PIA and beneficiaries or between land holders and landless)	4.28	.753	236
	(V9) Awareness about the Water Resource Management programme	4.28	.754	236
	(V10) Promotion of traditional and historical practices devised by local communities	3.50	1.201	236
	(V11) Gender of the Water Resource Management beneficiaries	3.85	1.153	236
	(V12) Village politics	3.74	1.134	236
	(V13) Power differential among the different cast and class people	3.66	1.113	236
	(V14) Level of social solidarity among the beneficiaries	3.56	1.242	236
	(V15) Heterogeneity in terms of cast and land holding	3.69	1.183	236
	(V16) Local leadership to mobilize the community for participation	3.63	1.219	236

	(V17) Illiteracy of the beneficiaries	3.64	1.262	236
3	(V18) Type of planning implementing agency(PIA) of Water Resource Management Project	4.25	.865	236
	(V19)Property rights over the Water Resource Management resources	3.83	1.218	236
	(V20) Natural resource treatment work undertaken during the implementation of Water Resource Management project	3.97	1.148	236
	(V21) Water availability	3.87	1.150	236
	(V22)Level of people's participation in previous project	3.69	1.249	236
	(V23) The size of Water Resource Management user group	3.77	1.134	236
	(V24) Trust between PIA and communities	3.82	1.127	236
	(V25) Misconception over the meaning of Participation	4.12	.797	236
	4	(V26) Sustainability of livelihoods provided by the Water Resource Management	4.04	1.127
(V27) Unequal distribution of the benefits by Water Resource Management to landless and land owning households		3.75	1.150	236
(V28) Poverty of the beneficiaries		3.88	1.005	236
(V29) Number of family members working		3.76	1.009	236
(V30) Good market linkages to sell the agricultural products		3.88	1.014	236
5		(V31) Land tenure system, whether it is temporary or permanent land Ownership	3.91	1.213
	(V32) Interaction with the technical officials and other PIA officials	3.95	1.121	236
	(V33) The percentage of land under villagecommons or open access	3.81	1.053	236
	(V34) The available infrastructure to access the Water Resource Management resources	3.74	1.086	236
	(V35) Environmental condition	3.68	1.073	236

Reliability test

Reliability test is carried out in research, to understand whether the questions in the questionnaire reliably measure the same latent variable (Rao, 2015). It helps in finding reliable cases for the analysis. In the present study, after collecting the data through a questionnaire survey, a reliability test was carried out on 35 variables using the Cronbach alpha coefficient method (Table, 4.3). The Cronbach alpha is found to be 0.936 in NGO implemented Water Resource Management area and 0.931 in GO implemented Water Resource Managements reveals the consistency among selected variables (Nunnally, 1978). These results support the validity and reliability of the questionnaire to measure the participation variables in a meaningful way.

Table 4.3: Reliability statistics

Type of PIA	Cronbach alpha	N of items
NGO	.936	35
GO	.931	35

Factor analysis

The purpose of factor analysis is to categorize a large number of variables or factors into small groups. These factor groups of data should be able to represent the relationships among the most considerable number of inter-related variables. In general, it is used to reduce a large number of variables into a few categories and group them on the basis of similar characteristics. In the present study, this technique is used to determine the groupings and reduce many variables into a few dimension/factors that affect the participation. Further, these factors are considered for the analysis. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity was carried out (Table 4.4) to check the sample adequacy (167 households of NGO and 236 households of GO made Water Resource Management) for factor analysis. The primary function of KMO test is to verify the sampling adequacy; ideally it should be more than 0.5. The values between 0.7-0.8 come under the category of acceptable, and values that are above 0.9 are excellent for the analysis. Bartlett's test is done to check the intensity of relationship among variables.

In view of Panda et al. (2012, p.445), "Bartlett's test of sphericity, tests whether the correlation matrix is an identity matrix, which would indicate that the factor model is inappropriate". The score of KMO and Bartlett's test of sphericity are found to be highly significant. In NGO made Water Resource Management area KMO measure was 0.874 while in GO made Water Resource Management KMO measure was 0.879. The generated scores of KMO (Table 4.4) from both the Water Resource Management areas supported the suitability of the data for the factor analysis. The Bartlett's test of sphericity is also measured and found to be significant (sig.). The value 0.000 in both the Water Resource Management areas demonstrates the importance of the study and show the validity and appropriateness of the responses gathered. Both the tests conducted revealed that sample size, questionnaire and data are found to be appropriate for the factor analysis of our study.

Table 4.4: Kaiser-Meyer-Olkin Measure (KMO) and Bartlett's Test

NGO implemented Water Resource Management	Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.874
	Bartlett's Test of Sphericity	
	Approx. Chi-Square df Sig.	3249.471 435 0.000
GO implemented Water Resource Management	Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.879
	Bartlett's Test of Sphericity	
	Approx. Chi-Square df Sig.	4318.829 435 0.000

4.4.1 Communalities

The Communalities signify the total amount of variance that the original variable shares with all other variables taken for the analysis. The Communalities are considered during the analysis to assess the acceptable levels of explanation of the included variables. Table 4.5 depicts the Communalities. Table 4.5 has two columns first column is the serial number of variables and questions (V1, V2, V11, V12....), the

second one is extraction. The principal component analysis assumes initially that all the variance between all the variables is common. The proportion of the difference (variance) explained by the different variable shows Communalities. The primary function of the Communalities is to represent the quantity of variance explained in every variable with remaining variables that are found after the extraction (Table 4.5, extraction column).

While checking the Communalities or the variance, the thumb rule is that the communalities of the variables should have a value greater than 0.50. If it is less than 0.50, then it is considered that the variable does not have sufficient explanation and is not being considered for the analysis. In this regard 5 variables have dropped from the analysis (V7, V12, V21, V29, and V35, Table. 4.5). These variables have communalities lesser than 0.50. In the present study, all the 30 variables of NGO and GO Water Resource Managements have communalities greater than 0.50. Therefore, all of them have taken for the further analysis. 5 variables have dropped from the analysis as they have Communalities less than 0.50. Table 4.5 shows the output of variables extracted through principal component analysis.

4.4.2. Initial Eigen values

The output of Table 4.6 shows the Eigen values related to each linear component (factor) before extraction, after extraction and rotation. The Eigen values related to each factor demonstrates the variance described by that specific linear component². The Eigen value is explained through percentage (Table 4.6, column 3, percent of variance). The first few factors are ordered according to their amount of variance and then subsequent factors. The subsequent factors do not explain greater amount of variance.

Table 4.5: Communalities

GO		NGO	
Sl no.	Extraction	Sl no.	Extraction
V1	.670	V1	.612
V2	.669	V2	.657
V3	.675	V3	.540
V4	.516	V4	.591
V5	.539	V5	.471
V6	.537	V6	.553
V7	.340	V7	.345
V8	.734	V8	.685
V9	.751	V9	.770
V10	.705	V10	.721
V11	.750	V11	.739
V12	.325	V12	.380
V13	.768	V13	.785
V14	.583	V14	.639
V15	.625	V15	.634
V16	.531	V16	.555
V17	.534	V17	.429
V18	.720	V18	.659
V19	.794	V19	.794
V20	.865	V20	.850
V21	.421	V21	.490

V22	.609	V22	.563
V23	.762	V23	.742

² For the further information, see the official webpage of sage publication at

<http://www.sagepub.com/field4e/study/smartalex/chapter17.pdf>

V24	.725	V24	.688
V25	.678	V25	.763
V26	.876	V26	.825
V27	.657	V27	.811
V28	.578	V28	.869
V29	.290	V29	.347
V30	.745	V30	.780
V31	.823	V31	.830
V32	.846	V32	.789
V33	.735	V33	.756
V34	.678	V34	.834
V35	.375	V35	.280

Notes: Extraction Method: Principal Component Analysis

While running the SPSS for this purpose, it extracts all the factors having Eigen value more than 1. Factor extraction is done by calculating the Eigen values of the R-matrix. R-matrix is a correlation matrix; it shows the correlation coefficient between each pair of variables. To analyse the importance of any component (Eigenvector), the extent of the associated Eigen values is looked into. SPSS uses Kaiser's standard of retaining factors, having Eigen values greater than 1 (Field, 2009a). In the present study, all the variables have Eigen values greater than 1. In the NGO implemented Water Resource Management area, the five extracted factors capture 64.274 percent of the variance of the 30 items; it can be estimated sufficient in terms of explained total variance. However, in case of GO implemented area, it is 63.082 percent of the variance. The five extracted factors are labelled as "Community participation", "Socio-cultural", "Economic", "Institutional" and "Physical-technical", respectively.

4.4.3 Extraction Sums of Squared Loadings

This section deals with the number of factors retained. The number of rows is made according to the number of factors retained. In the present study, the five rows in Table 4.6 correspond to five factors retained. The values are calculated based on their common variance. However, the values in this panel of table are comparatively always lower than the values of left panel of Table (labelled as Rotation Sums of Squared Loadings) as they are established on the common variance and are lesser than the total variance.

Factors Extracted through Principal Component Analysis of sampled households of both the studied Water Resource Managements

NGO implemented Water Resource Management									
*C	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	**PV	***CP	Total	**PV	***CV	Total	**PV	***CP
1	9.781	32.605	32.605	9.781	32.605	32.605	5.761	19.204	19.204
2	3.512	11.708	44.313	3.512	11.708	44.313	4.509	15.029	34.233

3	2.644	8.814	53.127	2.644	8.814	53.127	3.593	11.977	46.210
4	2.150	7.165	60.292	2.150	7.165	60.292	3.037	10.125	56.335
5	1.264	4.213	64.505	1.264	4.213	64.505	2.382	7.939	64.274
GO implemented Water Resource Management									
*C	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	**PV	***CP	Total	**PV	***CP	Total	**PV	***CP
1	9.312	31.041	31.041	9.312	31.041	31.041	5.673	18.911	18.911
2	3.282	10.940	41.980	3.282	10.940	41.980	4.607	15.358	34.268
3	2.582	8.605	50.585	2.582	8.605	50.585	3.193	10.643	44.912
4	2.406	8.019	58.605	2.406	8.019	58.605	2.927	9.757	54.669
5	1.367	4.555	63.160	1.367	4.555	63.160	2.524	8.413	63.082

Notes: *Component, **Percent of variance, ***Cumulative Percent

Rotation Sums of Squared Loadings

The last column of the Table 4.6 labelled as rotation sums of squared loadings represents the Eigen values of the factors after rotation. Rotation enhances the factors structure and helps in equalizing the relative importance of all the studied factors. In NGO implemented Water Resource Management, it has demonstrated that before rotation the variance of factor 1 was 32.605 percent that is higher than other four factors (11.708 percent, 8.814 percent, 7.165 percent and 4.213 percent). While after extraction the percentage of variance of factor 1 stands at only 19.204 percent of the variance. In GO made Water Resource Management, the variance of factor 1 was 31.041 percent, as higher than other four factors (10.940 percent, 8.605 percent, 8.019 percent and 4.555 percent). After extraction, the variance level of factor 1 is 18.911 percent. However, in NGO implemented Water Resource Management area, together all the components significantly explain the 64.274 percent of the variance. In case of GO implemented Water Resource Management area all the components shows the 63.082 percent of the variance (Table 4.6)

In Table 4.6, this column (Total) shows the Eigen values. It can be observed that the first component always contains most variance and has the highest Eigen value. And the next and successive components account for as lesser variance. Table 4.6 shows that in NGO implemented Water Resource Management area the first component has highest variance the successive component 9.781, similarly in case of GO made Water Resource Management, the first component variance is 9.312.

Cumulative percent

The cumulative percentage column in Table 4.6 represents the variance accounted for the first and all subsequent principal components.

Rotated component matrix

The rotated component matrix in factor analysis is called as Rotated factor matrix in factors analysis. Before the rotation, the factor loading the factor matrix is done. The factors loadings in factor matrix cannot be easily interpreted. In factor matrix, one variable may have high loadings on one or more than two other factors. Therefore, rotation factor matrix is done to make the factor loadings interpretable. Table 4.7 and 4.8 shows the factor loadings of the extracted factors after varimax rotation. Varimax rotational method is

used in the present study to get more simple and significant factor solutions. Generally in we find some variables corresponding to a particular factor in the rotated component matrix. Once we obtain these variables, we can assign them to a particular factor and give a suitable name to that factor.

From both the tables (Table 4.7 and 4.8), we find the number of variables that correspond to a particular factor. For example in NGO and GO implemented Water Resource Management areas, Factor 1 comprises of nine variables, conflict, awareness, traditional and historical practices to conserve the natural resources, gender, power differential, social solidarity, heterogeneity, local leadership, illiteracy. In this case, these variables can be clubbed together and termed as socio-cultural factors. Similarly, Factor 2 contains seven variables named, type of PIA, property rights, natural resource treatment work, participation in the previous project, the size of the user group, trust and misconception over meaning of participation. Together all these variables created a factor called, Institutional factor.

In case of Factor 3, the variables are participation in the pre-planning phase of Water Resource Management, planning phase, implementation phase, post-implementation phase, participation in meeting and decision making constitutes the factor named, community participation. The variables sustainability of livelihood, unequal distribution, and poverty and market linkage suitably fit into the economic factor. However, the variables land tenure system, interaction with PIA officials, land under village commons and accessibility to infrastructure are clubbed together and termed as the physical and technical factor. Based on the results of factor analysis method, it can be concluded that firstly the 30 variables were grouped under the five dimensions or the factors according to their factor loading value. The result of high loading of the variable shows the strong influence of factor on the variable. The arranged rotated values of factor loading with values 0.5 have been taken for further analysis. The purpose of factor loading is to predict the extent of the factor to explain a variable.

Table: 4.7: Rotated component matrix (NGO implemented Water Resource Management area)

Loaded Items	Factor Loadings				
	F1	F2	F3	F4	F5
F 1: Community Participation					
(V1) Whether participated in pre-planning phase	0.795				
(V2) Participation in planning phase	0.788				
(V3) Participation in implementation phase	0.754				
(V4) Participation in post implementation phase	0.642				
(V5) Participation in meetings	0.577				
(V6) Participation in decision making in Water Resource Management activities	0.559				
F 2: Socio-cultural factors					
(V8) Conflict among differ stakeholders (between PIA and beneficiaries or between land holders and landless)		0.834			
(V9) Awareness about the Water Resource Management programme		0.832			
(V10) Promotion of traditional practices devised by local communities		0.822			
(V11) Gender of the Water Resource Management beneficiaries		0.797			
(V13) Power differential among the different cast and class people		0.778			
(V14) Level of social solidarity among the beneficiaries		0.773			
(V15) Heterogeneity in terms of cast and land holding		0.732			
(V16) Local leadership to mobilize the community for participation		0.514			
(V17) Illiteracy of the beneficiaries		0.485			
F 3: Institutional factors					
(V18) Type of planning implementing agency (PIA) of Water Resource Management project			0.841		
(V19) Property rights over the Water Resource Management resources			0.800		
(V20) Natural resource treatment work under taken during the implementation of Water Resource Management project			0.786		
(V22) Level of people’s participation in previous project			0.741		
(V23) The size of Water Resource Management user group			0.712		
(V24) Trust between PIA and communities			0.688		
(V25) Misconception over the meaning of Participation			0.560		

F 4: Economic factors					
(V26) Sustainability of livelihoods provided by the Water Resource Management				0.841	



(V27) Unequal distribution of the benefits by Water Resource Management to landless and land owning households				0.904	
(V28) Poverty of the beneficiaries				0.831	
(V30) Good market linkages to sell the agricultural products				0.784	
F 5: Physical-technical factors					
(V31) Land tenure system, whether it is temporary or permanent land ownership					0.688
(V32) Interaction with the technical officials and other PIA officials					0.659
(V33) The percentage of land under village commons or open access					0.632
(V34) The available infrastructure to access the Water Resource Management resources					0.518

Extraction Method: Principal Component Analysis, Rotation Method: Varimax with Kaiser Normalization, a. Rotation converged in 5 iterations

Table: 4.8: Rotated component matrix (GO implemented Water Resource Management area)

Loaded Items	Factor Loadings				
	F1	F2	F3	F4	F5
F 1: Community Participation					
(V1) Whether participated in pre-planning phase	0.761				
(V2) Participation in planning phase	0.726				
(V3) Participation in implementation phase	0.723				
(V4) Participation in post implementation phase	0.691				
(V5) Participation in meetings	0.602				
(V6) Participation in decision making in Water Resource Management activities	0.544				
F 2: Socio-cultural factors					
(V8) Conflict among differ stakeholders (between PIA and beneficiaries or between land holders and landless)		0.850			
(V9) Awareness about the Water Resource Management programme		0.815			
(V10) Promotion of traditional practices devised by local communities		0.813			
(V11) Gender of the Water Resource Management beneficiaries		0.798			
(V13) Power differential among the different cast and class people		0.784			
(V14) Level of social solidarity among the beneficiaries		0.775			
(V15) Heterogeneity in terms of cast and land holding		0.762			

(V16) Local leadership to mobilize the community for participation		0.542			
(V17) Illiteracy of the beneficiaries		0.498			
F 3: Institutional factors					
(V18) Type of planning implementing agency (PIA) of Water Resource Management project			0.644		



(V19) Property rights over the Water Resource Management resources			0.816		
(V20) Natural resource treatment work under taken during the implementation of Water Resource Management project			0.815		
(V22) Level of people's participation in previous project			0.749		
(V23) The size of Water Resource Management user group			0.749		
(V24) Trust between PIA and communities			0.735		
(V25) Misconception over the meaning of Participation			0.831		
F 4: Economic factors					
(V26) Sustainability of livelihoods provided by the Water Resource Management				0.824	
(V27) Unequal distribution of the benefits by Water Resource Management to landless and land owning households				0.909	
(V28) Poverty of the beneficiaries				0.808	
(V30) Good market linkages to sell the agricultural products				0.794	
F 5: Physical-technical factors					
(V31) Land tenure system, whether it is temporary or permanent land ownership					0.761
(V32) Interaction with the technical officials and other PIA officials					0.729
(V33) The percentage of land under village commons or open access					0.640
(V34) The available infrastructure to access the Water Resource Management resources					0.614

Extraction Method: Principal Component Analysis, Rotation Method: Varimax with KaiserNormalization, a. Rotation converged in 5 iterations.

Community participation in Water Resource Management project

Factor loadings in Table 4.7 and 4.8 of both the NGO and GO implemented Water Resource Managements, show that almost all the variables of community participation is on the higher side. Higher factor loading of the variables indicates that these variables influence the participation process significantly. Highest factor loading of variable pre-planning phase, (0.795) in NGO implemented and (0.761) in GO implemented Water Resource Management shows that, it is most essential variable which the influence the overall participation. Along with the pre- planning phase of Water Resource Management project other phases of Water Resource Management project needs proper attention to involve the community.

Socio-cultural variable

The high factor loading value of 0.834 of the variable conflict, in NGO, implemented Water Resource Management area and 0.850 in GO implemented Water Resource Management indicates that this variable strongly influences the socio-cultural factor. During the field study number of casestudies of conflict (discussed in detail in chapter five) has found. The conflict mainly took place between PIA and Water Resource Management beneficiaries, and between the farmers. The causes of conflict was mainly concentrated on the sharing and distribution of the Water Resource Management project resources. Before the Water Resource Management project the villagers used to approach village chief for conflict resolution. But after Water Resource Management project the conflict resolution process becomes complex and now villagers are approaching the Water Resource Management officials for conflict resolution. Apart from the conflict other variables have also covered under the social-cultural factors, which affect the participation. These variables include awareness, traditional practices, gender, cast, class and level of social solidarity, heterogeneity, local leadership and Illiteracy. If community is aware about the programme and their traditional practices are encouraged in the participation they come forward for the participation. The male member participation is found to higher as most of the land related activities are carried out by them, the women, lower caste and class participation is low. Heterogeneity, leadership and illiteracy also affect the participation.

Institutional variable

In NGO implemented Water Resource Management high factor loading of the variable type of PIA (0.841) and in GO implemented Water Resource Management high factor loading of variable misconception over the meaning of participation (0.831), shows that these variables strongly influences the overall institutional variable. It is observed that in NGO implemented Water Resource Management that the approach of PIA plays a significant role to involve the community. The beneficiaries are mainly motivated to participate in case they are confident over the PIA' work. However, in GO implemented Water Resource Management the variable, misconception over the meaning of participation found to be essential to involve the community. The PIA failed to explain the meaning of participation to the community. Therefore while implementing the Water Resource Management project; these variables need to be addressed adequately. If the property rights is well defined and the natural resource activities give direct benefits then the

participation is high. On the other hand level of participation in previous project is high then the community is more confident to participate. The smaller group of people are easily motivated for their involvement. The variable 'trust between community and Water Resource Management officials' is also found to be relevant.

Economic variable

Factor loading is high in case of variable 'equal distribution of benefits of Water Resource Management resources', it is found to be (0.904 in NGO and 0.909 in GO implemented Water Resource Managements). In Water Resource Management project the unequal distribution of Water Resource Management benefits is one of the important issues. The inequality of resource distribution is found between the landless and land owner community. The land owner community gets more benefits in terms of water harvesting structures, land levelling and other land related benefits. In case of landless they don't get land related benefits. In this case, equal distribution of the benefits should be done among all the Water Resource Management beneficiaries to resolve the issue of inequality and poverty. Other economic variables such as sustainability of livelihoods, poverty and good market linkages also influence the participation.

Physical and technical variables

The factor loading was found to be high in the case of the variable, type of landownership (whether temporarily or permanent) 0.688 in NGO implemented Water Resource Management, and 0.761 in GO implemented Water Resource Management. This variable mainly influences the overall physical and technical variables. It is observed that the permanent land holders have come first for the participation then the temporary and landless community. This is because Water Resource Management project primarily focuses on land and water development works. The variables like interaction with the technical officials, land under village commons and available infrastructure are held responsible for the low participation. Frequent number of interaction establishes good rapport between officials and community. After the factor loadings of all the variables are complete, the five dimensions of study are identified and presented in Table 4.9. The identification of five dimensions of the present study is followed by the correlation analysis. Correlation analysis is applied to find out the positive or negative relationship between the dependent (community participation) and all

the four independent factors (socio-cultural, economic, institutional, and physical- technical).

Table 4.9: Factors/dimensions of the study

Sl.no.	Participation dimensions	Variables
1	Participation(Dependent)	Participated in pre-planning phase
		Participation in planning phase
		Participation in implementation phase
		Participation in post implementation phase
		Participation in meetings
		Participation in decision making in Water Resource Management activities
Factors affecting participation		
2	Social-cultural factors	Conflict
		Awareness
		Traditional and historical practices
		Gender
		Power differential
		Social solidarity
		Heterogeneity
		Local leadership
		Illiteracy
3	Institutional factors	Type of planning implementing agency (PIA)
		Property rights
		Natural resource treatment work
		Participation in previous project
		The size of user group
		Trust between PIA and communities
		Misconception over the meaning of participation
4	Economic factors	Sustainability of livelihoods
		Unequal distribution of the benefits
		Poverty
		Market linkages
5	Physical-technical factors	Land tenure system
		Interaction with the technical officials and
		Land under village commons
		Infrastructure availability

Correlations analysis

Table 4.10 (Pearson Correlations) indicates the relation between different dimensions. The correlation coefficient is the degree of the strength of the linear relationship between two dimensions. Field (2009b) says that “primarily the most important criterion is that the

significance value is less than 0.5”. However, if exact significance value is much lower, then we can be much more confident about the strength of the experimental effect. The values we use are 0.05, 0.01, and 0.001 (p.193). The correlation coefficient carries the values ranging between +1 and -1. The zero value shows that there is no relationship between dimensions. A+1 value represents the perfect positive relationship. It means that if one dimension changes its value, then other dimensions also amend its value. However, in case of -1, it shows the negative relationship. If one dimension increases its value, the other one will not increase its value. Values ranging between 0 and 0.3 (0 and -0.3) indicate weak positive relationships. Values between 0.3 and 0.7 (0.3 and -0.7) point out a moderate positive relationship. The values ranging between 0.7 and 1.0 (-0.7 and -1.0) show a highly positive (negative) relationship. In the present study, none of the correlations is found to be non-significant or having the value of p bigger than 0.001. Inter-correlation between the dimensions varies between low to moderate values. The socio-cultural (value 0.292) and institutional (value 0.598) dimension are found to be highly correlated with each other in NGO made Water Resource Management. It shows the positive relationship that means change in socio-cultural value will affect the institutional value. After correlation is over, the regression analysis is carried out to find out the effect of each factor on overall community participation.

Table 4.10: Correlation between dimensions (Pearson Correlations)

NGO implemented Water Resource Management area					
Factors	Participation	Economic	Institutional	Physical-technical	Socio-cultural
Participation	1				
Economic	.567**	1			
Institutional	.401**	.344**	1		
Physical-technical	.210**	.228**	.178**	1	
Socio-cultural	.413**	.292**	.598**	.133**	1
GO implemented Water Resource Management area					
Factors	Participation	Institutional	Economy	Physical-technical	Socio-cultural
Participation	1				
Institutional	.303**	1			
Economy	.515**	.345**	1		
Physical-technical	.222**	.167*	.194**	1	
Socio-cultural	.330**	.524**	.388**	.120	1

*Correlation is significant at 0.05 level (two-tailed)

**Correlation is significant at 0.01 level (two-tailed)

Regression analysis

Regression analysis refers to the statistical procedure that helps in establishing the relationships among variables. Regression analysis uses the empirical data for finding out; to what extent all the four independent factors affect the community participation in the Water Resource Management programme. Four factors socio-cultural, institutional, economic and physical technical are found to be significant for participation and acts as predictors of the criterion variable (community participation). Table 4.11 and 4.12 of both the NGO and GO implemented Water Resource Management show the results of regression analysis. Tables indicate range of unstandardized and standardized coefficients. In Table 4.11 and 4.12, Model 1 of NGO and model 2 of GO Water Resource Management, the 'Economic' variable (0.474 in NGO and 0.427 in GO implemented Water Resource Management) obtains the highest beta coefficient. It indicates the higher significance among other predictors in the Model. The t-value for the significance of each of the four predictors represents significance at 0.05 and 0.01 levels. Table 4.11 and 4.12 also provides obtained value for R (correlation coefficient), R Square (Regression coefficient) and adjusted R Square.

In this present study, the R value is found to be 0.632 in NGO made Water Resource Management and 0.576 in GO made Water Resource Management, signifies the higher level of correlation. It tells that all the four independent variables (socio-cultural, economic, institutional and physical technical) positively correlate with the dependable variable (community participation). Statistically, it is found to be true that the higher the value of R square implies, higher the level of explanatory power of the model. In the present study, the value of R square is 0.399 in NGO implemented Water Resource Management. This R-square value indicates that the predictor variables can explain 39 percent of the variance in the dependent variable. In case of GO implemented Water Resource Management, the value of R square is 0.332. Similarly, the predictor or independent variables explain the prediction of the 33 percent of the variance in the dependent variables. The external predictors will explain remaining variations.

The Adjusted R square represents the appropriateness of the model. Ideally adjusted R square value should be equal to or close to the value of R square. In both the models

(Model 1 of NGO implemented and Model 2 of GO implemented Water Resource Managements), the value of adjusted R square is 0.385 and 0.320 respectively. These adjusted R square values are close to the R square value of 0.399 and 0.332 respectively. These values support the fitness of the model. The standard error value of 0.45094 of Model 1 and 0.48668 of Model 2 indicates the reliable explanation of the model. Durbin-Watson Statistics (D- WS) helps to detect the autocorrelation problem present in the model. The ideal value of D-WS is 2. In both the models of our study, we find the value of Durbin-Watson (D-WS) is 1.919 and 1.751 respectively. It means that there is no autocorrelation present among the variables included in the model. The analysis of variance is carried out by taking into account these factors as predictor to identify the difference between the participation factors, such as socio-cultural, economic, institutional, physical-technical.

Table 4.11: Results of regression analysis of NGO implemented Water Resource Management

I Model	Unstandardized Coefficients		Standardized Coefficients	t	Sing.
	B	Std. Error	β		
(Constant)	1.272	0.297		4.290	.000
Economic	0.474	0.069	0.455	6.857	.000
Institutional	0.066	0.047	0.111	1.417	.048
Physical-technical	0.034	0.036	0.060	.953	.042
Socio-cultural	0.134	0.050	0.206	2.690	.008
Model 1	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
	0.632	0.399	0.385	0.45094	1.919

Predictors: (Constant), Socio-cultural, physical-technical, institutional
Dependent variable: Participation

Table 4.12: Results of regression analysis of GO implemented Water Resource Management

2 Model	Unstandardized Coefficients		Standardized Coefficients	t	Sing.
	B	Std. Error	β		
(Constant)	1.481	0.266		5.571	0.000
Economic	0.427	0.062	0.405	6.896	0.0000
Institutional	0.069	0.039	0.113	1.764	0.042
Physical-technical	0.037	0.033	0.062	1.126	0.031
Socio-cultural	0.128	0.044	0.187	2.902	0.004
2 Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
	0.576	0.332	0.320	0.48668	1.751

Predictors: (Constant), Socio-cultural, physical-technical, institutional
Dependent variable: Participation

Analysis of variance

Table 4.13 shows two ANOVA models, one each from NGO and GO implemented Water Resource Management areas. The residual of an observed value represents the deviation between the observed value and the expected value of the statistical error that are not observed. In simple terms, it is the observable quantity of the statistical error that has not been observed (for example, a sample mean value). The use and concept of residual and statistical error can be best explained by taking the example of the current data set. In the present study, the sample mean may be able to represent properly the whole population mean. But in this case, we can say that the difference between the response of each sample Water Resource Management beneficiaries and unobservable population mean (entire population of Water Resource Management beneficiaries) is called a statistical error.

However, the variance of the response of each Water Resource Management beneficiaries in a taken sample and the observable sample mean denotes a residual value. The Sum of Squares signifies three sources of variance viz; Model, Residual and Total. The ‘Total’ variation is the separations into the difference that can be represented by the independent variables (Regression) and the difference that cannot be represented by the independent variables (Residual). In the analysis of the variance, the term ‘df’ stands for the degrees of freedom

related to the sources of variance. In any case, the total variance has N-1 degrees of freedom. The regression degrees of freedom are equal to the number of coefficients calculated minus one.

The Mean Square is defined as the number of Squares divided by their particular degree of freedom. In our study together with five coefficients (including the intercept), the degrees of freedom for the model is given as $5 - 1 = 4$. The error in degrees of freedom is given by $df = 166 - 4 = 162$ in case of NGO implemented Water Resource Management area. While in GO implemented Water Resource Management area, it is given as $235 - 4 = 231$. The F statistics show the acceptability chances of the model. In other words, a predictor having low p-value probably indicates the acceptability of the model, as the changes in the predictor's value are associated with variations in the response variable.

The R square value (0.399 in case of NGO made (Table 4.11) and 0.332 (Table 4.12) in GO made Water Resource Management area) is supported by the $F = 26.938$ ($p < 0.05$, Table 4.13) in NGO and 28.710 ($p < 0.05$) in GO implemented Water Resource Management areas. This is significant at 5 percent level of significance (the sin. value is less than 0.05). Apart from this, the standard estimate of error (Table. 4.11 and 4.12) value is 0.45094 in NGO made Water Resource Management and 0.48668 in GO made Water Resource Management areas clearly indicates the reliable prediction of the model. Thus, we can conclude that the model correctly fits into our present study for analysis. The results of variance analysis show that the four selected dimensions are substantially different from each other. The following regression equation is made based on the independent and dependent variables considered during the study.

Table 4.13: Analysis of variance

NGO implemented Water Resource Management area						
1	Model	Sum of Squares	Df	Mean Square	F	Sig.
	Regression	21.911	4	5.478	26.938	.000
	Residual	32.942	162	.203		
	Total	54.853	166			
GO implemented Water Resource Management area						
1	Model	Sum of Squares	Df	Mean Square	F	Sig.
	Regression	27.201	4	6.800	28.710	.000
	Residual	54.714	231	.237		
	Total	81.914	235			

Predictors: (Constant), Socio-cultural, physical-technical, economic, institutional. Dependent variable: Participation.

Independent variables: The four dimensions obtained using factor analyses are considered as the independent variables for regression analysis. These dimensions include Socio-cultural (X_1), Economic (X_2), Institutional (X_3) and Physical-technical (X_4). These variables are called independent as they are not affected by the dependent variable (community participation). In fact these variables directly influence the participation.

Dependent variable (Y): Community participation in Water Resource Management development programme is taken as the dependent variable. This variable is called dependent as it changes if there is change in above four variables.

The mathematical demonstration of the regression equation of the NGO implemented Water Resource Management area is estimated in this way;

$$Y = a_0 + a_1X_1 + a_2X_2 + a_3X_3 + a_4X_4 \quad (1a)$$

Considering the values from Table 4.11, the regression equation of NGO implemented Water Resource Management area is written in the following form;

$$Y = 1.272 + 0.474X_1 + 0.066X_2 + 0.034X_3 + 0.134X_4 \quad (2a)$$

Community participation = $1.272 + 0.474 \times \text{economic} + 0.066 \times \text{institutional} + 0.034 \times \text{physical and technical} + 0.134 \times \text{socio-cultural}$.

Similarly for GO implemented Water Resource Management, the regression equation is as follows; Y

$$= b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 \quad (1b)$$

After putting the values of variables (Table 4.12) the equation is like this; $Y = 1.481 + 0.427X_1 +$

$$0.69X_2 + 0.374X_3 + 0.128X_4 \quad (2b)$$

Community participation = $1.481 + 0.427 \times \text{economic} + 0.69 \times \text{institutional} + 0.37 \times \text{physical and technical} + 0.128 \times \text{socio-cultural}$.

In the above regression equations (1a, 2a and 1b, 2b) of the NGO and GO implemented Water Resource Management areas, a_0 and b_0 are constants and describe the values of dependent variables. If the values of other independent variables are zero, a_0 and b_0 are also called intercept because it decides where the regression line touches the Y-axis. The coefficients of the independent variables of NGO implemented Water Resource Management are a_0, a_1, a_2, a_3 and a_4 . Similarly,

the coefficients of the independent variables of GO implemented Water Resource Management are b_0, b_1, b_2, b_3 and b_4 . Each unit change in independent variable value causes a change in the calculation of the mean value of the dependent variables. It can be depicted from Table 4.13 that the socio-cultural factors (0.134 in NGO and 0.128 in GO implemented Water Resource Management area) follows the economic factors (0.474 in NGO and 0.427 in GO made Water Resource Management) in having more influence on the overall participation.

The main reasons attributed to the highest influence of economic factors in participation process are linked to livelihood, poverty, employment, short term and long term benefits and market linkage. The Water Resource Management project enhances the agricultural and non-agricultural job opportunities (details will be discussing in chapter- 6). Hence, community participation in the Water Resource Management development programme is highly motivated by the economic needs. Majority of the Water Resource Management beneficiaries are poor therefore, the primary objective of their participation is to access some monetary benefits from the Water Resource Management projects. However, semi medium and medium farmers participate with two motives, firstly to get more economic benefits and to influence the decision-making process.

The socio-cultural factors such as conflict, awareness, heterogeneity, gender, power differential, influence the community participation. Among the socio-cultural factors, the most significant variable is conflict. Due to conflict, the farmers are often discouraged to participate. As number of case of studies of conflict have found during field study, the next chapter will be discussing it in detail. Gender is another crucial variable that is highly correlated with the participation level. The institutional factor is also a key determinant of involvement; however, in comparison with economic and socio-cultural factor it has a mild impact on participation. The physical and technical factors contribute least to the overall participation. The highest variable under this category that affects the participation is land tenure system.

CHAPTER- V Conflict and Conflict Resolution

Introduction

Although the concept of conflict was discussed in the previous chapter, not much attempt was made for the elaborate explanation on the causes and resolution of conflict. The present chapter focuses on the various causes and conflict resolving bodies in traditional and modern society. The concept of conflict refers to a disagreement between two individuals or institutions or groups. In social anthropology and sociology, the term social conflict may be defined as a struggle over values to gain status, power and resources. The aim of the conflicting parties is not only to achieve the desired values but also to neutralize or eliminate their rivals (Coser, 1956). In his book 'The functions of social conflict' (1956), Lewis Coser sees the social conflict from the perspective of structural-functionalism, which refers to a process of reintegration to the social change. The concept of conflict in sociological theories emerged during the nineteenth and early twentieth centuries.

However, in the mid-twentieth century the functionalists did not pay much attention to the conflict within the society. They were much more concerned about the integrating mechanisms like culture, norms, and common values that help in maintaining social order or stability rather than those phenomena that cause conflict and social change. From the functionalist point of view, the work of Talcott Parsons is significant for analysing conflict in society. Talcott Parsons (2007), a structural functionalist, states that the smooth functioning of social systems depends on maintaining equilibrium between the total flow of demands and supply of resources among the elements of society such as; the polity, economy, status, and culture, together all these constitute a social system. Any disturbance that affects this equilibrium of demand and supply resource flow in society leaves that society in a state of disequilibrium or dysfunction or prone to revolution. However, Lockwood (1956) argued that Parson created a fictionalized conception of the social world. He emphasized more on a systematically generated mechanism that maintains the equilibrium in society than a disequilibrium or disorder. For the

functionalists, conflict is a pathological state of the society. In the late 1950s, Ralf Dahrendorf criticized the Parsonian model of society which is based on consensus, integration, and stability. Dahrendorf reflected two dimensions of the society one are consensus, and the other is a conflict (cited in Turner, 2002). All the conflict theorists have taken the concept of power as a central element in their analysis of conflicts. C. Wright Mills (1999) talked about the sharing of power among the leaders of military, industry and politics (also known as power elite groups). He states that as ordinary citizens are powerless therefore directly or indirectly they are coerced to follow the elite, groups. There are three types of powers exercised by the power elite groups in any society, i.e. Authority (power given by powerless of the society voluntarily), Manipulation (power exerted by a particular group but unknown to the powerless) and Coercion (the type of power in which helpless are forced to follow the powerful). The members of the power elite groups share a similar origin, education, and lifestyle. Conflict refers to a mode of interaction between two or more persons in which the parties concerned attempt to control each other's behaviour.

The chances of conflict are more when two related parties are divided by incompatible interests or goals or fall in a state of competition for the control of scarce resources. While discussing culture and conflict Avruch (1996) differentiates conflict from dispute and concludes that "Conflict refers to some fundamental incompatibility in the very structure of a relationship and dispute refers to a particular episodic manifestation of a conflict. A dispute is a social activation "it occurs when at least one party goes public with the conflict, brings it to the attention of others in the group or community or decides to act on it" (Avruch, 1996, p. 242). The functional conflict theorists emphasize the importance of the interests of a group of norms and values. In this regard the way in which the pursuit of interests generates various types of dissatisfaction among groups as routine aspects of social life rather than abnormal or dysfunctional aspect. In case of natural resource management, conflict of interest arises between the users and non-users. Different degrees of access to resources are often a cause of conflict among its users (Stanbury, Pamela & Lynott, 1992). These resources could be agricultural lands, water, and common grazing land and forests resources. Both users and non-users prefer to

manage these resources in their way. The disagreements and incompatibility among two or more groups in using and managing these natural resources is an inevitable phenomenon in all human societies. Since the implementation of natural resource management programs (NRMP), the intensity of conflict has increased over the time. Further, the conflict among the user groups affects the level of participation and sustainability of the livelihood. Due to the relevance of conflict in general and in the area of NRMP in particular, identification of the sources and causes of conflict is essential for prioritizing the same. Accordingly an understanding of the historical and cultural background and the duration of the conflict is necessary (Hasnain & Hasnain, 2006).

Conflict is not a single entity, but it is generated by multiple groups as they lay claim to natural resources again it is at centre stage in cultural politics (Baviskar, 2003). Tania (2003) in her study in Indonesia found that, after the fall of Suharto regime in 1998, resource conflicts have generally been classified into two categories: 1) vertical conflicts that arose between rural people and the state or state-sponsored corporations; and 2) horizontal conflicts that took place between one social, ethnic or religious group against another. Differences arise because different stakeholders have different needs and perceptions. In this situation, the failure to arrive at a decision that meets the needs of all stakeholders results in conflict. For instance, to avoid conflict in the case of Water Resource Management project management, male preferences with respect to the use of water for irrigation needs to be compatible with female concerns for use of water for domestic use and other purposes.

Concerning the Water Resource Management development program, understanding conflict is necessary as the Water Resource Management is an essential unit of managing land, water, and other natural resources. Conflicts in Water Resource Management programs may occur at different levels, they may take place between the Water Resource Management Committee (WC) and the User Groups (UGs), the WC and the Self-help Groups (SHGs), the SHGs and the UGs. Sometimes it may also arise within Water Resource Management Association (because it is heterogeneous entity), or between farmers and the PIA for the selection of a site of Water Resource Management physical structures or among Water Resource Management secretary, presidents and UGs. Conflict may also occur between landholders and landless

and between the farmers having land on upper reach and lower reach farmers. The mechanisms adopted to resolve these conflicts involved both formal and informal systems. The formal methods include local courts while in informal methods a negotiation was done by mediators, mostly the elderly members of the village. It was observed that the conflicts arose due to some factors like, lack of planning of management of Water Resource Management resources without the consultation of the local community, limited involvement of people in Water Resource Management project, the institutional arrangements, lack of awareness and lack of coordination between the PIA and user groups. Other factors of conflict include weak monitoring and evaluating procedures, unequal distribution of Water Resource Management resources and the ineffective role of the village council in resolving the conflicts.

On the other hand, it was observed that the chances of conflict are less due to some elements of gender, class and age as they restrict the violent attitudes of certain groups and individuals. Women groups avoid expressing their grievances because of fear, lack of trust and social pressure. The poor and women feel marginalized and face economic constraints, and they are mostly excluded from decision-making procedures in the conflict resolution process. The elderly too are less likely to involve in a conflict because of their physical constraints. In the present chapter, an attempt is made to understand causes of conflicts associated with the sharing of Water Resource Management resources. This chapter also analyses the traditional and modern patterns of conflict resolution process in Water Resource Management program.

Conclusion

Traditional conflict resolution approaches

The collective consciousness among the people to take any decision regarding the village affairs was higher in the traditional society than in the modern society. Conflicts over the use of natural resources, particularly the water and land resources were not frequent in the rural social structure. Though the conflict among the people residing in one village or one locality was very rare, intra-community conflicts did not occur. The social customs, values and norms used to keep away the villagers from intra-village conflicts. But if the intra-community or intra-village conflict arose, it was resolved by the traditional village

chief or village council members. However, the frequency and intensity of conflicts were very less. The inter-village and inter-community conflict was also resolved by the village chiefs and villages council members. As agriculture was a dominant source of livelihood in most of the cases, the reason for the conflict was related to water for irrigation from the ordinary village pond. Sometimes there were conflicts over the use of grazing land and forest products. On the other hand, there is no competition among the villagers when water is used for domestic purpose. For irrigation, they mainly depended on rain water and as it is a universal need, collective action for the rainwater conservation was in place. They had a good system of water management. Before the introduction of the Water Resource Management program, the traditional village councils were playing an essential role in managing the water problems and conflicts.

In a traditional society, if any conflict relating to the conservation of natural resources gets evoked than the community in that village would solve it. If they failed to solve the disputes by themselves, they used to take the matter to the village chief. Village chief used to interfere only if the villagers approach him/her. After that the traditional village council would resolve the conflict. In case the dispute could not be settled at the village level, it used to be referred to the next level of appeal, i.e., statutory *Panchayat*. If they were unable to solve the problem, they approached the police and law courts. In all the villages covered under the study, it was observed that the traditional village chief belonged to either the elite group or an upper caste group. All the villagers irrespective of their caste and community used to abide by the chief's order. It was also observed that the people of the most respectable caste, Brahmin community, would also respect the chief even if he belonged to a tribal community.

In the past, the conflicting parties of both the Water Resource Managements directly approached the *Gauntiya* (a village chief) to register their complainant. *Gauntiya* was an elderly man of the village and he got the position of a village chief based on his ownership of land (medium farmers, who possess land more than 20 acres) irrespective of his caste or community. The traditional leadership of *Gauntiya* was hereditary. *Gauntiya* in turn used to instruct both the conflicting parties to inform the villagers regarding the place and time

of meeting in which their conflict has to be resolved. The meeting would be held in the evening as it was a convenient time for all the farmers. By evening, all of them would get back from their agricultural fields. Sometimes the meeting would run more than a day till the conflict got resolved.

Usually, the meeting used to be held in the village *mandap* (stage). In case of rain, the meeting would be shifted to the residence of *Gauntiya*. The conflicting parties usually take the responsibility of passing the information to all the villagers. On the day of meeting, all the elders of the village used to gather at a specified place. The participation of women in the meeting was tiny and even if they were present; their opinions were not taken into consideration. Women were called only if they were involved in the conflict or if they were the eye witnesses in a conflict. In some cases, their husband would speak on behalf of them. In the assembly, the villagers were free to ask the questions to the conflicting parties. The process was somewhat democratic in nature. The village community's views were taken seriously in a traditional village council, before arriving at any judgment. The *Gauntiya* did not make the decision independently, but he also involved other elders present at the meeting to analyze the dispute and to cross-examine the witnesses if necessary.

In a conflict resolution if a complainant referred any witnesses, the *Gauntiya* used to cross-examine the truthfulness of witnesses from many aspects. In this case, the witness might have to take an oath to his/her ancestors and it was considered to be taken seriously. The village elders had rights to question them regarding the causes of the dispute. They used to ask the time and place of crime, the reason for their presence, the matter he/she saw, what they did. Depending on the nature and seriousness of the case, the meeting was organized. In some instances, the problem was resolved during the first gathering of the villagers.

However, if it was not solved, then they called the meeting again, and if the case was too complicated, it used to take two or three meetings. After the examination of the facts and views of the witnesses, the village chief used to discuss all the dimensions of the case and based on the nature of the crime the penalties were announced. *Gauntiya* used to deliver

the judgment and tell the culprit to pay the compensation in cash or kind to the opposite party. The physical or mental punishment was prohibited. Instead penalties were in the form of compensation by way of money, repairing anything that has been damaged. For example, if they broke the water harvesting structure or open well, they had to get it repaired by using their labor and money. If someone took more water from the village pond or littered with it, he/she had to organize a feast for all the village council members along with some other elders and they would extract a promise that he would not do it again.

There were some other forms of penalties also. For example, giving a feast or some bottles of local wine to the village council members and throwing a party. If the convicted party did not obey the judgment passed by the village council, the villagers socially and economically ostracized him/her. The following two case studies of conflict between Teka Ghiblea and Dino Bhoi (Case I) in the NGO implemented Water Resource Management project and between Prohit Karmi and Indro Sahu (Case II) in the GO applied Water Resource Management throw an insight into the functioning of the traditional council.

Case I

In the NGO implemented Water Resource Management area, fifty-year-old Teka Ghiblea (Name changed for identity protection) and fifty-seven-year-old Dino Bhoi (Name changed for identity protection) of the Danipali village had a conflict during the year 2000. This conflict was of an intra-village and inter-community in nature. While Teka Ghiblea belongs to the Gouda (OBC) community, Dino Bhoi is a Sahara (ST) farmer. Both of them own land near the Ghaikhayi Canal that bypasses the Danipali village. Teka Ghiblea is a semi medium farmer owning more than five acres of land and Dino is a marginal farmer having less than 2.5 acres of land adjacent to the property of Teka. While Dino has his land in the lower region of that canal, Teka has his land in the upper reach. Being a marginal farmer Dino was poor, and agriculture was the only source of livelihood for him. In the month of May-June, the water level in the canal was low and the monsoon was uncertain.

Therefore all the villagers and the elderly members and the *Gauntiya* had appealed to all farmers to share the existing water equally. As there was no proper drainage system, the water has to pass through Teka's land to reach Dino's land. In this context, Dino requested Teka to release more water to his land but Teka refused and built a bund in drainage so that more water cannot flow from his land to Dino's land. Because of this, Dino could not get more water for irrigation. Teka also did not listen to the appeal of Dino's friends and relatives. Finally, Dino along with his relatives approached the village council and council chief (*Gauntiya*). After this, they arranged a meeting in the village for finding a solution by taking both the parties into consideration. In the meeting, the *Gauntiya* heard both the parties and also the witnesses from both the sides.

The *Gauntiya* after consultation with the elders arrived at a decision that Teka was found guilty of not allowing more water to Dino's land, and he also put a barrier that prohibited the free flow of water. As a solution to this conflict, the village council members warned Teka not to repeat the mistake. After the meeting, Teka had to offer wine and meat to all villagers present at the meeting. Teka obliged by the decision of *Gauntiya*. The above case indicates that the traditional village chief had the power to resolve the conflicts. The power and authority that is vested with village chief promotes social solidarity and maintains the social order. The resolution of this conflict shows that the village chief took a fair decision, and no discrimination was made on the basis of landholdings of the farmer. This indicates that everyone is equal before the law.

Case II

In the GO implemented Water Resource Management a conflict broke out in Bhudipadar village because of less availability of water in a village pond in 1995. The conflict was between Prohit Karmi a 40-year-old farmer, and Indro Sahu, a 52-year-old farmer. Both of them are OBCs. While Prohit Karmi belongs to Dumal community, Indro Sahu belongs to Teli community. Prohit Karmi a small farmer owns land near the pond that falls opposite to the side of the main road. Indro Sahu, a marginal farmer has land closer to the pond. During summer, the pond gets dried up, and only a little water was available for irrigation. Indro Sahu's land was closer to the pond so he could use most of the water for

irrigation. Other villagers would take the water only for domestic purpose. Villagers did not like this attitude of Indro, but they could not oppose it openly.

Once Prohit was drunk, and he abused him in front of Indro's house in his absence. However, the same was informed to Indro by his family members and that made him angry. This situation got serious into a verbal duel and later into a physical conflict. To control the situation, other villagers intervened and tried to settle the issue. For a permanent solution, an informal meeting was called by the *Gauntiya*, which was attended by other village elders and other farmers. After having a discussion with both the parties and witnesses, the *Gauntiya* consulted the elder farmers who were present at the meeting. In the meeting, the majority of the villagers supported the Prohit but they did not support his physical violence. Therefore, the village council members found Indro guilty and imposed some penalty on him. In this case, he was warned not to use much water of village pond during the summer or at the time of low rainfall. Prohit was warned not to abuse Indro again. Further, they were asked to offer wine to the villagers present at the meeting. Both of them accepted the decision of elders and village council members.

From the above case, it can be observed that the village council members used to hear the views of people and took the decision in a democratic way. And collective interests of the people usually prevailed over the individual interests. In every conflict resolution meeting, the priority of the *Gauntiya* and the village elders was to create a win-win situation for both the parties and to avoid the conflicts in future. However, in few cases even though the aggrieved individuals did not get the right compensation, but they abided by the decisions of village chief and elders. According to some of the respondents, if the accused was not able to pay compensation at the time of conflict resolution he/she could ask for extra time limit, like one or two months. But in this regard the other party too should also agree on giving him more time to pay back. The time limit depends on the nature of the damage, for example if it was physical injury and the aggrieved person wanted compensation in terms of money for the treatment soon. But in case, someone breaking the bund or changed the course of the channel from the village pond to the agricultural land he could be given the time to get it repaired till rainy season.

It can be concluded that conflicts may have erupted in the villages of both the Water Resource Managements due to differences in need, priority and greed for excess use of resources. Sometimes the elite group of users wants to access the resources at the expense of marginal sections of society which leads to conflict. It was found that few of the higher economic class like semi medium and medium farmers own the Water Resource Management physical structures easily than unprivileged class (marginal and landless people). Conflict may arise because of differences in accessibility between the haves and have-nots. It was observed during the fieldwork in GO implemented Water Resource Management that small farmer belonging to the Brahmin caste got the farm pond first his land due to his social prestige than small farmer belonging to the Scheduled caste (SC). In few of cases, it caused the conflict between the upper caste and lower caste people.

It was also observed that the political influence played a greater role in the decision-making process. The *Sarpanch* and the *ex-Sarpanch* had played a significant role in this regard. The social groups who had power or who do not have power try to get authority over the others. In few cases, it was found that conflict arose to share Water Resource Management resources because of unequal distribution of power and authority. Before the implementation of the Water Resource Management the type of authority prevailed in all villages was a traditional type of authority. In the traditional form of authority, subordinates follow their superordinate. Much before the implementation of the Water Resource Management, the above two cases show the traditional type of authority to resolve the conflicts.

The villagers (subordinates) consented to the decision of village council members or elders (superordinate). Therefore, the chances of conflict were less and resolved at the village level itself. But in some cases when the traditional village council (*Gauntiya* system) failed to solve the dispute, *Gauntiya* referred the particular case to the statutory *Panchayat* to resolve it and in worst cases if the statutory *Panchayat* also failed to answer it, the *Sarpanch* of the statutory *Panchayat* used to refer this matter to the police. It is notable that in modern society even if some conflict arises regarding the sharing of Water Resource Management resources, firstly they approached formal institution such as Water Resource Management officials. The role of village council members started declining. It was also observed that

a dominant group can go with a conflict for a longer period whereas a poorer group that lacked support in terms of money and power cannot sustain and would withdraw.

Inter village and inter-ethnic conflict

During the field study, it was observed that few cases that fell under the category of inter-village and inter-ethnic conflict were referred to outside the village Panchayat. In that meeting, the *Sarpanch* of the villages, conflicting parties, witnesses and elderly members or ex-*Sarpanch* were used to be present. The following case studies from both the study areas illustrate the conflict between two farmers belonging to two different villages.

Case III

In 1998, a conflict between two farmers belonging to two different villages was referred to *Sarpanch* in an NGO implemented Water Resource Management. Conflict arose between Jharu Nag, a 55-year-old farmer of Danipali village and Manglu Sagar, a 48-year-old farmer of Jharbandhali village. They belonged to Gonda community and both of them were landless and used to cultivate the government forest land for nearly five years. As the land did not belong to them, a proper demarcation was not made by them. While Jharu's land is situated in an upper reach of the Water Resource Management area, Manglu's land is located in middle reach. Once Jharu had cut some trees and shrubs for selling and domestic use, which was nearer to the Manglu's land. On seeing the act of Jharu, Manglu abused him and also lodged a complaint with the village chief. After having a discussion in the meeting, *Gauntiya* (village chief) found both of them guilty as they had encroached upon the government land and fine was imposed on each of them.

Manglu accepted the judgment, but Jharu refused. He told that though the land was not his own, he has been cultivating it for five years, so he has rights over the trees. As the village councils failed to convince Jharu, they had no option but to refer this case to the *Sarpanch* of Bendra Panchayat. After a few days, the *Sarpanch* called a meeting in which Manglu, Jharu and senior members from both Danipali and Jharbandhali village were present. After listening to both the parties their respective witnesses and also the village chiefs of both the villages, the *Sarpanch* imposed fine on both of them. Jharu was told to give some share of money to Manglu as he sold the trees while Manglu was told to offer

some wine to villagers present at the meeting. Both of them accepted this judgment. After the introduction of Statutory *Panchayat* and *Gram Sabha*, the traditional village council did not play a significant role in conflict resolution. Before the introduction of the Water Resource Management project (2004-05) during post the 90s, most of the cases of inter-village conflicts were restricted to the common grazing land, water bodies and forest lands. During that period, cases were directly taken to the *Gram Sabha* and then to the traditional village chief. After the introduction of Water Resource Management program the inter-village conflicts relating to agricultural irrigation, accessibility of common land and water bodies or intra-generational conflict for the construction of Water Harvesting Structure (WHS) on private land were mostly taken to the Planning Implementing Agency (PIA). With the implementation phases of the Water Resource Management project during 2004- 2010 the conflicts were more over the sharing of water of percolation pond, use of forest land, grazing the land and other natural resources on common land. Planning Implementing Agency (PIA) did not define ownership of these resources to the user groups.

The intra-generational conflict also took place taking the issue of construction of WHS on private land. The introduction of horticulture in GO implemented Water Resource Management and diversification of crops and cultivation during *Rabi* season in NGO implemented Water Resource Management created a competition among the beneficiaries to get more and more water. The sanitation program introduced in NGO implemented Water Resource Management also created demand for the more water for domestic use. As discussed earlier that after the implementation of Water Resource Management project villagers mainly approached the PIA for the conflict resolution.

Apart from this the NGO implemented Water Resource Management established a conflict resolution center (*Samadhan Kendra*) in the village. Ten members of this group are elderly members of the village. Along with these members, the conflicting parties and Water Resource Management secretary and the president also had to be present at the meeting. Conflicting parties had to call all the members and told them the timings of meeting. The conflict resolution centre was situated in the Jharbandhali village, but this institution did not sustain in the post-project period. The analysis of the data shows that the conflict takes place not only between two

individuals, but it can happen between two villages as well. If it arises between two villages the communication and exchange of goods and services get disturbed.

The social gathering of two villages gets suspended for example celebrating festivals and rituals together and engaging in the marital relationship. The inter-village disputes or conflict may arise at the time of implementation of Water Resource Management if the people see that, adjoining village is getting more facilities for water conservation. Besides this conflict also occurs when people cross the boundary of one village to access the Water Resource Management resources, forest resources, and common land resources. The case study 'IV' of NGO implemented Water Resource Management and case study 'V' of GO implemented Water Resource Management shows the findings of inter-village conflicts. The people of Danipali village of NGO implemented Water Resource Management accused PIA for unequal distribution of Water Resource Management benefits in two villages that led to conflict between people of two villages. In case of GO implemented Water Resource Management areas, the competition among the population of all three villages to get more benefits from the Water Resource Management project, gave rise to the conflicting situation.

Case IV

In 2006, the PIA officials of NGO implemented Water Resource Management organized a meeting in Danipali village. During the discussion over Water Resource Management works to be carried out, a group of people who were not satisfied with the works of PIA started abusing. Later on the conflict arises between the villagers of Daniplai and Jharbandhali villagers. The officials of PIA failed to resolve this conflict that led to the breaking of communication between the two villages for a year. The implementation of the Water Resource Management project was stopped in the Danipali village in 2006 that runs only for two years (from 2004-05 to 2005-06). At the time of interview during the field work; it was found that people did not approach the elder members of both villages and not even the *Sarpanch* and statutory *Panchayat* of the village to solve this problem.

The respondents replied that they did not approach any other conflict resolution body as the matter was related to the implementation of the Water Resource Management project for which PIA is solely responsible. A similar type of case study was also observed in the GO implemented Water Resource Management, where the people of two villages were dissatisfied with the work

of PIA. The PIA constructed more number of land and water conservation physical structures in Bhudipadar village than in Saltalpali and Grusumunda village. The conflict broke out between people of Saltalpali and Bhudipadar village. The resentment of Saltalpali villagers over PIA took the form of anger.

Sudam Bhoi of Saltalpali village and Mahadev Biji of Bhudipadar village once fought with each other. While Sudam belongs to Saura community and is a small farmer having 4 acres of land, Mahadev belongs to the Gauda community and is a marginal farmer having 1.5 acres of land. Sudam's land is situated in the upper reach of the Water Resource Management and Mahadev's land is in middle reach. Both of them share the water from the village pond adjoining to Gusuramunda village. In summer either there was no water or very less water was found in the pond. Even the availability of lesser water in the pond (*pokhri*), did not allow the lower reach farmers to get it due to silt and weeds and improper drainage system. To reach the lower reach farmer's land the water had to pass through the lands situated in the upper and middle reach farmer's land.

The farmers having land at lower reach had to struggle to get some water to save their crops during drought period. In 2010, there was a severe drought in this area. Mahadev, who has land in middle reach, was likely to lose all his crops. Once he lost his patience and shouted at Sudam, who was able to manage to get some water from the pond through drainage (nally) system as his land was closer to the pond. Mahadev wanted Sudam to allow some water to his land and also to strengthen his drainage channels so that water can flow to his land. But Sudam did not do it as he was much worried about his own crops. Mahadev was annoyed with PIA because in most of the cases they provided irrigation facilities to semi- medium and medium farmers. At the time of Water Resource Management project implementation, he did not have any source of irrigation. On the other hand, Sudam who was availing water from his private open well also got access to water from the common village pond. This situation aggravated and the conflict between Mahadev and Sudam changed into inter-village and inter-community conflict. In this case, neither PIA nor elders of the village had intervened to resolve the conflict.

After shouting at each other for a while, Mahadev and Sudam became silent. In this context, the structural functionalist perspective as discussed by Talcott Parson (as cited in Reddy, 1986) is relevant. The structural-functionalist perspective stated that if some disturbance affects equilibrium state of demand and supply resource flow in society, it leads to conflict. Equal distribution of resources maintains balance in various social systems i.e. polity, the economy, status, and culture. In case of Mahadev and Sudam, the unequal distribution of Water Resource Management resource caused conflict between them. In NGO implemented Water Resource Management, PIA was successful to resolve the conflict, in few cases but when the conflict became more serious, PIA was unable to resolve. In GO implemented Water Resource Management the conflict not only took place between the beneficiaries but also found among the user group presidents and Water Resource Management president.

Case V

In 2006, a conflict erupted between a group of people and Water Resource Management secretary in Gusuramunda village of GO implemented Water Resource Management. Both the conflicting parties were belonging to the same community called Dumat. At the time of implementation of the Water Resource Management project, a five feet in-depth small compost pit was given to few of the farmers to store the cow dung. The farmers who did not get the compost pit got annoyed with the secretary. One evening they gathered at common village place, shouted at the Water Resource Management secretary for not providing the compost pit to every individual. The friends and relatives of secretary got involved in an argument and the intensity of the conflict got increased. After the intervention of some of the other villagers, the dispute was stopped.

The villagers accused Secretary, favouring friends, relatives or his acquaintances only. The secretary defended himself saying that PIA officials instructed him to construct a limited number of compost pit due to limited fund. However, the compost pit was a requirement for all the villagers to store the cow dung to use it at the time of cultivation. Due to non-availability of compost pit, sometimes stored cow dung was sowed. Because of the competition, the villagers who do not need compost pit demanded cash as their co- farmers got some money to construct it. However, their request went in vain since the secretary did not listen to them. They approached the Water Resource Management president and Water Resource Management

officials but unfortunately they too did not respond positively and never interacted with the villagers. As discussed earlier that much before the introduction of Water Resource Management project most of the conflicts were resolved by village council member or the *Sarpanch* of the village. But after the introduction of the Water Resource Management project, the PIA officials used to resolve the conflicts. The officials never carried consultations either the traditional villagechief or the village *Sarpanch*. In most cases, the parties directly went to the Water Resource Management officials ignoring the village elders or *Sarpanch*. After the withdrawal of the Water Resource Management officials from the villages, they used to approach Water Resource Management president or Water Resource Managementsecretary. During the interview, some of the beneficiaries stated that the non-existence of alternative conflict resolution bodies in traditional days, they used to approach the traditional village chief or the *Sarpanch*.

But now a day in most of the Water Resource Management resource cases they have to contact Water Resource Management officials to receive direct and fast benefits. The benefit-oriented interest had encouraged the wealthy and few upper caste farmers to maintain close relations with PIA. It was observed that almost all the cases related to Water Resource Management resources shared during 2004- 2010, farmers would request the PIA officials to intervene and resolve the conflicts. It was stated by some of the beneficiaries that, if the conflict arose due to incomplete or lowin-depth farm pond (Plate, 4.1) the PIA officials did not listen to the marginal farmersand hijacked the cases. The un-welcomed intervention of the Water Resource Management officials sometimes discourages the farmer to approach PIA for conflict resolution and it made thesituation more complicated.

Case VI

In 2006, a conflict arose between two brothers over construction of farm pond on the private land. They were Khadi Pradhan, a 45-year-old farmer and Jibardhan Pradhan, a 32-year-old farmer of Jharbandhali village of NGO implemented Water Resource Management. After the implementation of the Water Resource Management, they got back their mortgage land. The PIA helpedthem financially to get it back. Both of them were marginal farmers and were belonged tothe Dumal community. While Khadi Pradhan's land is situated in the upper reach of the Water Resource Management, Jibardhan Pradhan's land is located in the lower reach. The construction of

field bunding took place on the high land. The land was not divided between two brothers. It was still in the name of their father (Arjun Pradhan, 60-year-old). But the real land owner (Arjun Pradhan) had agreed to get it registered in the land of his younger son (Jibardhan Pradhan).

Field bunding started on their land before the cultivation. When field bunding was in progress on the land of Jibardhan Pradhan at that time Khadi Pradhan started abusing him. Khadi Pradhan wanted the field bunding on his land. Later on both of them (Khadi and Jibardhan), started fighting with each other. Looking into the situation the PIA stopped the construction work and asked them to compromise. However, both of them did not agree for any compensation or agreement. PIA tried to solve this matter but failed to satisfy both the parties. After this incident both of them approached the *Sarpanch* of Salebhata Panchayat to intervene in this matter without consulting the village chief and their father. They narrated the incident to the *Sarpanch* in the *Gram Sabha* meeting. After discussing the issue in the *Gram Sabha* meeting, the village *Sarpanch* called a meeting at Panchayat office at Bendra, where elder members of *Gram Sabha* were invited. After hearing the point of view of both the parties and their respective witnesses, *Sarpanch* requested them to compromise but they did not. *Sarpanch* postponed this matter for one month, which did not bring any solution.

Therefore, *Sarpanch* instructed both the parties to meet the PIA as this case was related to the Water Resource Management project. They approached PIA but PIA refused to intervene as the fund for construction of field bunding, and implementation phase of the Water Resource Management was over. In the end, none of them got the field bunding on their land. In this case, the view given by Jayawardane (1963) was found to be true. As he discussed that in conflicting situation one party wants to control, each other's behaviour and conflicting parties go for a competition to the control of scarce resources. The two brothers, Khadi and Jibardhan Pradhan were competent for field bunding construction on their lands.

Case VII

At the time of construction of Water Resource Management physical structures, the presidents of every user groups wanted to have Water Resource Management structures first on their lands. They feared that the materials used for the construction would be finished. In NGO implemented Water Resource Management, same kind of incident was observed, but it did not lead to any serious conflict between the PIA and beneficiaries or between the President of Water Resource Management and members of the Water Resource Management association. In GO implemented Water Resource Management a conflict broke out between 60-year-old Himansusekhar Pradhan (Water Resource Management president) of Gurusamunda village and Ram Pradhan of Bhudipadar village. Ram Pradhan is a small farmer; he possesses the land at lower reach whereas Himansusekhar Pradhan is a semi medium farmer and possesses land at upper reach. It was an intra-ethnic group conflict as both of them belonged to *Dumal* communities. During the implementation of Water Resource Management Ram Pradhan requested the WDT members and PIA to construct a farm pond (*Chahala*) first on his land. As his land belonged to the lower reach of Water Resource Management, he needed water for irrigation. Himansusekhar owned the land situated on the upper reach of the Water Resource Management area. He had a private source of irrigation for his crops. To attain their personal gain, in Water Resource Management committee meeting both Ram Pradhan and Himansusekhar Pradhan insisted the PIA officials to quickly start the construction of Water Resource Management physical structures works in their village first though they were more concerned with their personal gains. The verbal abuse in Water Resource Management meeting between the Ram Pradhan and Himansusekhar became serious. After two weeks, in next meeting, the PIA officials convinced both of them to resolve their disputes. But Ram Pradhan and Himansusekhar did not resolve their conflict. The above case highlights the weakening of the traditional authority that was based on social status. The traditional type of authority helped in maintaining harmony in the village and there were very lesser chances of conflict.

Earlier the village social system was based on mutual sharing of natural resources and mutual understanding among the villagers. The maintenance and distribution of resources were symbolic in nature. The disputes were resolved inside the village territory, but the above case indicates that the conflict was moved out of the villages. The mutual understanding and the symbolic interaction for the use of resources had also decreased. It had direct impact on the village solidarity and villagers respect for the traditional authority. The following case further illustrated the declining of the village authority by the Water Resource Management officials thereby further eroding the people's faith on village council for conflict resolution.

Case VIII

In 2008, a conflict arose between Sadhu Bachor and Bhala Banchor of Budhipadar village in the GO implemented Water Resource Management. Both of them possessed the same percolation pond (*munda*). While Sadhu's land was situated in the upper reach of the Water Resource Management, Bhala's land was in lower reach. Sadhu was a small farmer, and Bhala was a marginal farmer. Both of them belonged to the Dumal community. Sadhu cultivated groundnuts (*mungfalli*) and black gram (*urad*) and Bhala cultivated paddy. At the time of cultivation, there was sufficient water in the percolation pond. Even though there was

water but it could not reach the Bhala' land due to no proper drainage system from Sadhu's land. Bhala wanted more water because generally paddy consumes more water in *Kharif* season, but Sadhu did not have any problem as his crops did not require more water. He was trying to keep his land little dry as it will be good for growing the crops. But Bhala who needed more water approached Sadhu to allow some water to his land. But his request was not positively responded by Bhala as his crop would have been affected. Even Bhala requested the office bearers of the Water Resource Management, but they did not help him.

After few days in Sadhu's absence, Bhala cut the field boundary of Sadhu and opened the outlet. Sadhu was shocked on seeing the outlet open, and the boundary of his field adjoining to Bhala's land was broken. Because of the heavy flow of the water some of his plants got damaged, and he feared that they may die. Sadhu and his wife along with his brother in law rushed to Bhala's home and shouted at him. It pulled other villagers there. Bhala tried to convince Sadhu about his intention to save the paddy. Sadhu did not accept this request rather he was beaten by Sadhu and his relatives. Later he was rescued by the villagers. Next day Bhala complained about this incidence to PIA officials and Water Resource Management secretary. They just consoled him and told him that they would convince Sadhu. Bhala was not satisfied with their judgment, and he filed a case in Ramapur police station against Sadhu.

Later on Water Resource Management president intervened and convinced both the parties for compromise. Bhala was quite unhappy with this judgment, but he had to accept it. It was observed that in most of the cases the marginal farmers and landless failed in getting justice. The Water Resource Management president and secretary favored the landlords and elite group of the villages in the event of conflict resolution process. In traditional village conflict resolution system, both the marginal and large farmers were treated equally before the law. It was observed that with the intervention of Water Resource Management program, the marginal farmers who used to be treated as equals lost their power. On the other hand, if the conflict occurred between a semi medium or medium farmer the Water Resource Management officials do little fair justice. It was found that the transparency and accountability in resolving the dispute were better in NGO implemented Water Resource Management than in GO implemented Water Resource Management.

Grass-root level institutions and PIA's role in conflict resolution

Before the introduction of the Water Resource Management project, people were mostly dependent on informal institutions (friends, elderly members of the village.) for the conflict resolution. However, it was not mentioned in the Water Resource Management guideline (2001) that PIA has to resolve the conflict but PIA was given the credit for the smooth functioning of the Water Resource Management project in a particular area. The cases discussed below will reflect at what level the PIA was able to resolve the conflicts among the beneficiaries. Generally Water Resource Management development team, secretary and president got involved in conflict resolution.

Case IX

In NGO implemented Water Resource Management, a conflict occurred between PIA officials and Water Resource Management beneficiaries in 2006. Baru Sagar, a 60-year-old marginal farmer of Jharbadhali

village, had a conflict with Water Resource Management officials. He belongs to Gonda community, and he has three sons named Shushil Sagar (40 years aged), Kausal Sagar (35 years aged) and Rudra Sagar (32 years aged). Agriculture and daily wage labour were their principal occupation. During the implementation of Water Resource Management they got a farm pond (*Chahala*). When they were digging a pit, a big stone hampered farm pond work and which was very low in-depth. Baru drew the attention of PIA officials about this matter. However, his grievance was not responded positively due to financial constraints. PIA official asked them to contribute some money so that re-digging could have been possible, but they were not ready for same.

Once when the PIA officials were constructing farm pond on some other land, Baru went there and shouted at them. However, it was only verbal abuse. Baru did not approach any of the conflict resolution body before approaching PIA officials. On the other hand, PIA was unable to deal with the conflicts with the farmers but they did not approach any eldermembers of the village for mediating in the matter. The PIA did not encourage the traditional local socio-cultural approach to dispute management. Further, it discourages people's faith in their created conflict resolution institutions. It also created a situation for the Water Resource Management beneficiary regarding whom they should approach for the conflict resolution if once PIA withdrew from the Water Resource Management area.

Socio-cultural aspects of conflict and Water Resource Management development programme

It came into notice that the conflict was not only confined to the sharing of Water Resource Management resources but also related to the social relations. And sometimes the social conflict got diverted to sharing of Water Resource Management resources. It was found that most of the inter-caste conflicts arose and symbolically they reflected in day to day social interactions in Water Resource Management activities. A case study of the dispute between Bhimsen Saa and Katula Muduli explains that the roots of conflicts are infused in the caste differences, and they manifested into a conflict of Water Resource Management resources sharing.

Case X

In Jharbandhali village of NGO implemented Water Resource Management if the villagers face some natural calamities like flood or drought, they do a ritual called Indro puja (God of water) for the well-being of all the villagers. Before the implementation of Water Resource Management, in the year 2002 this village received very scanty water. For organizing a religious ceremony, a group of people was collecting money from all the villagers. In that group a 40-year-old farmer, Bhimsen Saa had an argument with the 42-year-old Katula Muduli about raising the money. Bhimsen Saa belongs to Pandra community, and Katula Muduli belonged to

Keuta community. There is a tradition in the village that at the end of the ritual all the villagers cook and eat together and distribute local wine, and meat among all households present there. Katula too was present at that ceremony. While distributing the food to Katula, Bhimsen objected as Katula did not contribute the fund. However, because of the intervention of few elder members of the village Katula was allowed to take

food.

The action of Bhimsen led to a dispute between Bhimsen and Katula. From that day, onwards both of them were not on talking terms. After the implementation of the Water Resource Management project, it got manifested as a conflict related to sharing of water of village common open well. Both of them had their kitchen garden adjoining to the common openwell. Bhimsen was a small farmer, and Katula was a marginal farmer. Katula cultivated some vegetable, and his economy was more or less dependent on vegetables while Bhimsen grew the vegetables only for his consumption. Before the implementation of the Water Resource Management, that open well was not cleaned, and much water was not available. The level of water got increased with the intervention of Water Resource Management community development fund. The hostile relationship between Bhimsen and Katula was observed in the distribution of common open well water. During the *Kharif* season in 2002, starting from the sowing of seeds to harvesting, they were involved in abusing each other. As Bhimsen's land was nearer to the open well, he wanted to take all the water before Katula use it. In the month of August, there was no rain, Katula's vegetables were dying. As there was very less water in well Katula could avail more water only if Bhimsen would use less water. On the other hand, Bhimsen's plantations did not need much water as his land was closer to open well, and the soil moisture of his land was better than Katula's land. One day Katula borrowed a pumping machine from a medium farmer of the village and drew up water from the well without consulting Bhimsen. On seeing this, Bhimsen went to the Water Resource Management office in their village and requested the officials of Water Resource Management to impose fine on Katula. The Water Resource Management officials intervened in the matter, but Katula was too poor to pay any penalties imposed on him. Finally, officials asked both the parties to compromise and co-operate each other, and they warned Katula not to use all the water in future. This clearly demonstrates how interpersonal relations affected the use of water.

Conflict over leadership

At the village level, many grass-root level institutions were created such as Self Help Groups (SHGs), *Kisan Mitra* (farmer's friend), *Gram Sabha*, Statutory *Panchayat* and Water Resource Management committee. Most often conflicting situations arise when the leaders of some institutions come together for a particular meeting with selfish interest. At the time of the creation of different committees of Water Resource Management, it was observed that the leaders of various institutions contested for the post of president and Water Resource Management secretary. During the discussion with the contesting candidates it was found that most of them wanted to occupy the positions of president and secretary for monetary grants and the power associated with the positions so that they could help their friends and relatives to construct the water harvesting structures easily. The *Ex-sarpanch* or current *Sarpanch* played a significant role in the selection or nomination of the name of the Water Resource Management president or secretary. It was observed that Water Resource Management president and the secretary cannot win or cannot do their work without any political support. Local level political interference sometimes disturbs decision making of the Water Resource Management president or other leaders. For instance, the president of GO implemented Water Resource Management was an *Ex-sarpanch* of the village and belongs to the Biju Janata Dal (BJD).

Therefore, sometimes the Congress party supporters opposed the decision of president accusing him of showing partiality. In NGO implemented Water Resource Management direct interference of the politics was not seen but during election both the president and secretary of the Water Resource Management campaign for the BJD. The different interest of the various groups in society, including political groups led to conflict.

The political group is a system of participation in society in which people participate for their wellbeing. In this regard according to Coleman (as cited in Reddy, 1986) a new system of involvement can create differences in values and interests and as a result it can become a ground for conflicting reactions. The above argument discussed by the theorists from the school of incompatibility of interests was prevalent in the field area. The individual and community interests over the use of resources along with ethnic differences have made the situation more and more complex and conflict oriented. For some beneficiary, a Water Resource Management project created an opportunities to avail the water and other natural resources but for few other groups it deprived them of achieving their interests.

It was observed in the case of landless and marginal farmers of Saltapali village of GO implemented Water Resource Management that the benefit of micro-finance they received after the Water Resource Management was very less than their expectations. On the contrary, the people of Gusuramunda village of the same Water Resource Management project were getting some extra benefits, created a frustration in the minds of Saltapali villagers which resulted in conflict. It was also observed that sometimes minor conflicts between neighbouring villages over common grazing land or forest resources situated on community land occurred as the ownership over common land is not confined to any group. But if it falls under a particular village jurisdiction and neighbouring village access it, there is a potentiality of violence.

The demand for the grazing land is more throughout the year, but it is more intense at the beginning of *Kharif* season. Most of the farmers use bullocks for cultivation, and they feed them green grass. At the same time, conflict for water resources also tends to occur as water is the essential need, especially those farmers who do not have any water harvesting structure on their land. The Water Resource Management beneficiaries stated that most of the time the inter-village conflicts arose over the use of wood or cutting trees of common forest between two villages. Ideologically all the villagers should co-operate with each other to manage the Water Resource Management resources; however, it was not found in practice.

Case XI

It was observed that on few occasions, the conflict between Danipali and Bakti village of NGO implemented Water Resource Management occur during the *Kharif* season. The farmers of both the villages use the water of Gaikhai canal. Danipali village is situated in the upper reach of the canal whereas Bakti village is on the lower reach. During June 2003, there was very little rain. All farmers having land nearby the canal were trying to get more water by using the electrical machine, mostly semi medium and medium farmers. The Bakti villagers accused the Danipali villagers that they took all the water, therefore; there was no sufficient water to irrigate their crops even once. The people of two villages together

at the bank of canal one day and started abusing each other. After getting this information, the *Sarpanch* and other elder members of both the villages came there and tried to convince the people. However, the problem was not solved completely as they failed to decide which village can get how much water. But at that point of time it was told to all the farmers that canal is joint property, and both the villages can use its water. The elders of both the villages ensured that in future this would not happen.

Concluding Remarks

From the analysis, it is clear that before the introduction of the Water Resource Management Development Programs (WSDP) especially in the traditional society, the conflicts over natural resources use were very rare. The conflict resolution was not a very complicated process, and the traditional village chief used to resolve the disputes with the help of the village elders. The nature of penalty was dependent on the paying ability to conflict parties. If the culprit was able to pay money, he had to pay or else he had to put in his labour to get the things repaired. Sometimes he or she was warned by the village chief not to repeat his/her mistakes in future. The people used to respect their traditional culture and village chief. The next conflict resolution body after the village chief was the village *Sarpanch*, and it was observed that when the traditional village council failed to solve the case it is resolved by the *Sarpanch* of statutory Panchayat. The cases hardly went to the third level i.e.; police station. The introduction of WSDP made the situation little complicated. The Project Implementing Agency (PIA) was primarily responsible for sorting out any problem related to the Water Resource Management or Water Resource Management resources use. In case of a conflict regarding the Water Resource Management resource use people approached the PIA first to address their grievances rather than traditional village chief. Few of the farmers believed that their proximity to the Water Resource Management officials might fetch them extra benefits in terms of Water Resource Management assets and financial help. Some of the villagers went to the PIA frequently in the hope of getting some permanent employment. It was also found that the introduction of WSDP, during 2004-05 has created a competition for the use of natural resources. It brought significant changes in conflict resolution system. Before the introduction of the Water Resource Management project, the causes of conflicts were lesser or it was only confined to the overuse of forest resources. But after the introduction of the Water Resource Management project various dimensions of the conflict emerged. People competed for the use of more natural resources of village common land at the cost of others and individuals also struggled for the private ownership of few of common property resources. For instance, in case of the GO implemented Water Resource Management the plantation for all the village community done on non-arable private land became the individual property. Fighting for leadership, money, profit-making attitude and fight for the construction of water harvesting structures has increased the tension in the studied areas.

The causes of conflicts were found to be similar in most of the cases. However, in all the cases the PIA failed to resolve the conflict completely. Besides the inability of the PIA to resolve the conflict, the lack of adjustment of the new institution with the traditional one has also created a problem in the process of conflict resolution. The ideology of the community participation in a Water Resource Management program that the beneficiaries control their Water Resource Management resources and run the program smoothly with the

collaboration of external agency by themselves is yet to be realized. Conflicts in the NGO implemented Water Resource Management were more than that of the GO implemented Water Resource Management because in the NGO implemented Water Resource Management more development took place on the community land in addition that people were more aware of the use of Water Resource Management resources.

In the GO implemented Water Resource Management more Water Resource Management physical structures were carried out on the private land and people were not very much aware of their rights over different natural resources. As mentioned in the earlier chapter (chapter third) that the level of community participation in various implementing phases of Water Resource Management i.e. from pre- planning to post-project period is affected by various factors. Conflict is one of the major factors that hinder the participation. The higher level of the conflict results in lower the level of community involvement. Along with the promotion of community participation, the very objective of the Water Resource Management project is to improve the livelihood practices. With the modifications in Water Resource Management guidelines, the livelihood improvement is added as a major area that should be enhanced. The forthcoming chapter will discuss the impact of the Water Resource Management project on livelihoods of the community.

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