

Author's Full Name : **SUDEEP KUMAR<sup>1</sup>**

Affiliation and Contact Details: ASSISTANT PROFESSOR  
DEPARTMENT OF RESEARCH AND PUBLICATIONS  
XAVIER INSTITUTE OF SOCIAL SERVICE, RANCHI  
(JHARKHAND)  
E-mail: [sudeepkumar@xiss.ac.in](mailto:sudeepkumar@xiss.ac.in); [skg74@rediffmail.com](mailto:skg74@rediffmail.com)  
+91 8969602570 (Mobile)

Title of the Paper: **Water Resource Management through Collective Action: A Study in the Context of Water User Group among the Tribes of Eastern India**

**Permission to add paper to the DLC archive:** “The author agrees to allow the Digital Library of the Commons to add this paper to its archives for IASC conferences.”

---

<sup>1</sup> Assistant Professor, Department of Research & Publications, Xavier Institute of Social Service (XISS), Dr. Camil Bulcke Path, Ranchi, Jharkhand (India), Email: [sudeepkumar@xiss.ac.in](mailto:sudeepkumar@xiss.ac.in); [skg74@rediffmail.com](mailto:skg74@rediffmail.com)

## **Water Resource Management through Collective Action: A Study in the Context of Water User Group among the Tribes of Eastern India**

**Abstract:** *Water is one of the important natural resources that humanity needs for survival and progress. The judicious use and management of water resources is very much essential for agricultural development leading to improvement in the quality of life of the people in general. Although a number of efforts have been undertaken by many welfare functionaries in this direction; but, by and large, the fruits have not been favourable in the case of tribes and backward communities worldwide. This is especially so in the case of developing countries like India where about seventy percent of the population reside in the rural areas depending on agricultural activities for their livelihoods. The state of Jharkhand (a resource – rich– poor state) in eastern India is no exception to it. Under such circumstances, people’s participation or collective action as an alternative way in the management of water resources for the agricultural development leading to future progress and prosperity becomes very much necessary.*

*In this backdrop, the present study is intended to examine the structure, function and management of a water user group – Swarnrekha Pani Panchayat in one of the tribal villages of eastern India (in Jamshedpur district, Jharkhand). The study also attempts to analyze the newly generated institutional framework in terms of its sustainability and self reliance through collective action for social transformation. The study is based on ethnographic approach using standard fieldwork research technique like observations, in-depth interviews, case studies and focused group discussions among the experimental (21 members of Pani Panchayat) and controlled (21 non-members) groups of the study area. The study reveals that there has been a significant change in the quality of life of the water user group members in the study area. However, despite a strong sense of identity and social bond there are tendencies to evade individual responsibilities governing the collectiveness. It may be concluded that such newly formed institutions need stimulation to strengthen collective action approach for bringing transformation among these backward groups.*

**Key words:** *Collective Action, Ethnographic Approach, Water Resource Management, Social Transformation, Swarnrekha Pani Panchayat, Eastern India.*

### **Introduction**

The contribution of irrigation to agricultural production cannot be underestimated. Accordingly, agrarian communities all over the world have always recognized the significance of irrigation. However, scholarly interest in the social organization of irrigation is of relatively recent origin. The systematic study of irrigation organization and its relation to social structure gained momentum with Wittfogel’s “Oriental Despotism,” which was published in 1957. Later on, the concern about increasing the agricultural production in the developing countries by the introduction of “new technologies” added to the importance of studies on water resource management.

Inspired by Wittfogel’s theory of “Hydraulic Society<sup>2</sup>.” Hunt and Hunt (1976) conducted an exhaustive survey of anthropological literature to investigate the relationship between canal

---

<sup>2</sup> A particular kind of system with a particular form of distribution of power in exploiting a particular resource.

irrigation and local social organization. They wanted to explore similar features at a micro level especially the local organization of the tasks pursuant to watershed.

In the Indian context, the concept of Lift Irrigation System is very old. However, it came into prominence only in the drought years of 1966 and 1987. It simply means collection and storage of water, either run off or creek-flow for irrigation use. The above line of thinking was picked up for the first time by Geddes (1963) and by Robert Wade (1979). According to Wade, “the issue is important not only for our understanding of social evolution and village social organization, but also, more practically, because of the connection between the social organization of irrigation and the productivity of irrigation and hence food and raw material production.” he studied 24 villages in a district of Andhra Pradesh, ‘where within the same small area are villages which show a degree of corporate irrigation organization greater than has been previously reported for any Indian village (whether for irrigation or any other secular activity excluding ‘tribal’ villages), and also villages which show no trace of this form of organization, though equally dependent on irrigation’ (ibid).

The corporate irrigation organizations that Wade discusses are commonly known as ‘water user’s associations’. Some studies of such associations have been conducted in different parts of the country, for example, for Tanjore and Chingleput districts of Tamil Nadu, see Beteille (1966); Ensminger, (1998) for Tamil Nadu, see Chambers 1980, for Gujarat, the land of co-operatives, Sinha (1981), Jayaraman (1981), Narayana et. al. (1982) and Kumar, (2005). However, in these studies not much attention has been paid either to the internal contradictions within the associations or to their links with the social structure so far as water resource management is concerned.

The present paper attempts to look at the structure, function and management of a water user group in terms of its institutional framework, sustainability and self-reliance leading to the overall social transformation and change in quality of life of the tribal beneficiaries and non-beneficiaries.

### **Collective Action: Conceptual Framework**

Collective action is all about encouraging individuals to undertake cooperation, collective effort and responsibility, and reciprocal assistance based on mutual interests and the expectation of mutual benefits. Characteristically, it should promote a group/community/society to create a non-exploitative system for managing its own affairs and lead itself to self-reliance.

According to Mahatma Gandhi (1961) the philosophy of collective action emphasizes individual action. Through co-operative effort the people proceed to create new institutions and new forms of social life. It believes that everything in the world is owned by the community. There is no room for individual property or private ownership and the action is not directed towards profit making but service and sacrifice. A very good example of collective action as understood by Mahatma Gandhi is “Sarvodaya System” (A systems of society for the welfare of all). Acharya Vinoba Bhave and Jayaprakash Narayan and many Gandhians joined hands with him in this movement. The integration of individual and society at the collective level is a type of unique methodological speciality of sarvodaya. These principles can be applied at both micro and macro levels involving individuals, institutions and society (Prasad, 2009).

Collective action can take many shapes: examples are water users' associations like sharing the costs of water delivery, investments and maintenance of irrigation infrastructure and equipment, water management, etc., and other formal or informal groups like regulation of grazing, forest management, etc. (icra-edu.org) Collective action itself can be of several types, depending on the type of work and type of work or action. These may be:

- (i) **Group work** – all members are required to do the work together (e.g. clean a common irrigation canal).
- (ii) **Organized work** – all members are required to do the work, but not together. Their work may be organized in rotation (e.g. patrolling a community forest).
- (iii) **Independent work** – all members are required to do the work, but they can work independently (e.g. maintaining the irrigation canals that cross one's own fields).
- (iv) **Physical action** – members do physical work
- (v) **Contribution action** – by cash or in kind instead of physically
- (vi) **Regulation action** – members prohibit something, supervise or enforce regulations.

There are several branches of social science which are concerned with the theories of collective action, for example organization theory, economic theory, anthropological theory and political science. They all deal with the same issue: human behaviour and what motivates people to do the things needed to produce and maintain collective goods. But each discipline looks at these issues from a different perspective and in order to answer a different set of questions related with human behaviour.

Oslon (1965) argues that unless a group has very specific characteristics the provision of the collective good is doomed to fail. This stark conclusion clearly explains why many identifiable groups fail to organize themselves despite the obvious benefits of doing so. Although, understanding collective action is certainly interesting because of its successes, it is essential because of its failures. Understanding why collective actions have failed to provide us with collective goods is the highest priorities of the social sciences (Ostrom, 1998; 2000).

### **Jharkhand: A Resource Rich-Poor State in Eastern India**

*Jharkhand*<sup>3</sup> the twenty-eighth state of Indian territory situated in Eastern India is regarded as the richest in terms of natural human and mineral resources. Its geographical area is 7.97 million hectares with 3.8 million hectares as the total cultivable land. Since it is endowed with rich mineral resources, it contributes to nearly 40 per cent of the total mineral production in the country. This region produces 48 per cent of the country's coal, 48 per cent of bauxite, 45 per cent of mica, 100 per cent of kyanite and 90 per cent of apatite. Other minerals are iron ore, china clay, copper, manganese, limestone and atomic minerals to mention a few. Besides, it is rich in forests with Asia's richest sal trees and has 29 per cent of the state's total land as forests (Aareparampil, 1989 as cited in Ekka, 2011). In terms of fresh water resources Jharkhand is rich in ponds, water harvesting structures and mountain rivers. There are huge opportunities of using these water resources for agricultural development. The State has 5482 million cusecs of underground water available for use. It also has a potential of developing 20 per cent more underground water for multipurpose use including its use for irrigation purposes.

---

<sup>3</sup> A Hindi word meaning a land of forest.

It comprises of 24 districts covering about 79.7 thousand square kilometers. According to 2011 Census it has a population of 3,29,66238 having 26 percent ST and 12 percent SC with BPL level rising as high as 70 percent in eight districts. The average literacy level is 68 percent with female literacy being even lower at 56 percent. There are 32 tribal groups in Jharkhand including 9 primitive tribes which are at the verge of extinction. *Santhals, Mundas, Oraons, Hos and Kharias* are the five major tribes living in Jharkhand. It is of great concern that tribal population in Jharkhand is declining continuously and is around 26% of the total population of the State.

Due to human induced declining ecology the tribals are faced with problems, like unemployment, migration, displacement, poverty, malnutrition, starvation, disease, extremism, etc. Not much has changed in the lives of these tribal groups after independence and even after the creation of a separate State. Out of the total Below Poverty Line (BPL) families of 23.85 lakh in Jharkhand, 12.70 lakh i.e. 53.22 percent belong to the weaker sections, especially the Scheduled Castes and Scheduled Tribes. Again, out of the total BPL families, more than 70 percent are concentrated in Dumka, Jamtara, West Singhbhum, Saraikela, Palamu and Garhwa districts of Jharkhand alone. Broadly speaking, both the SC's and ST's are highly vulnerable, voiceless and powerless, they also lack access to any influence over the institutions of the State, resources and services it can provide.

India being a welfare state has implemented a number of developmental programmes since independence for the upliftment and well being of the poor and the socially excluded groups. Usually, the marginalized groups like scheduled castes, scheduled tribes, other backward castes and women are the worst victims of social exclusion. However, the fruits of development are far from the reach of these deprived groups. The state of Jharkhand is no exception to it as the tribals and backward communities of this state are still placed low in the development index of the poor groups. The following socio-demographic profile of the state is self explanatory for fulfilling the essential condition of socially excluded state.

The state has achieved its new identity fourteen years back, but after more than a decade's developmental intervention in various socio-economic aspects including modernity, the bulk of the populace is still gripped with ignorance and poverty leading to their social exclusion. The developmental programmes based on top down model have not succeeded in bringing the desired change in the lives of the down trodden and backward communities (SC, ST, OBC). Thus people's action/collective action is the need of the hour so far as the management of water resources is concerned for the change in their quality of life and social transformation of the society at large. The collective action involves a participatory approach and an alternative way to a future of progress and prosperity for these socially excluded groups residing in the resource rich remote areas and villages of Jharkhand.

### **Objectives of the Study**

In this backdrop, the present study is intended to examine the structure, function and management of a water user group – *Swarnrekha Pani Panchayat* in one of the tribal villages of eastern India (in Jamshedpur district, Jharkhand). The study also attempts to analyze the newly generated institutional framework in terms of its sustainability and self reliance through collective action for social transformation. The study also involves a careful analysis of the newly generated institutional framework of *Pani Panchayat* in terms of its sustainability and self reliance.

## Research Methodology and Fieldwork

This paper is based on an ethnographic research (Kumar, 2014) conducted in Idalbera one of the service villages of Tata Steel, with a multi-disciplinary approach using both quantitative as well as qualitative data. The study included both desk and field reviews from secondary and primary sources. The sample size was decided keeping in mind the characteristics of the selected beneficiaries of *Pani Panchayat* as part of rural development schemes of Tata Steel.

The next step was to select beneficiaries out of the total beneficiaries covered under the Tata Steel Rural Development Society (TSRDS) programmes. Out of the total number of household beneficiaries all the 21 beneficiaries from water user group were selected covering all social groups. Besides, 21 respondents who were not part of the *Pani Panchayat* (controlled group) were also selected for the present study. Thus, in all 42 respondents were interviewed for the present study. Sample size of the study is given as follows:

**Table 1. Sample size and Selection of Respondents for the Study**

Total No. of Households	Total No. of Beneficiaries covered under TSRDS Project in Idalbera (PP and SHG)	Sample Size	
		Beneficiaries selected for survey	Non-Beneficiaries Respondents selected of survey
<b>130</b>	<b>56</b>	<b>21</b>	<b>21</b>
ST: 59	SHGs: 35	ST: 18	07
OBC: 56	Pani Panchayats: 21	OBC: 03	07
SC: 15		SC: Nil	07

**Source: Primary data collected from field work, 2011**

The field work and data collection for the study was done by the research team in two spells. The research team visited Idalbera - First for five days i.e. 20<sup>th</sup> April to 24<sup>th</sup> April, 2011; and Second for eleven days i.e. 4<sup>th</sup> July to 14<sup>th</sup> July, 2011 to obtain information on the qualitative and quantitative aspects of the data. The research team had camped in Idalbera village throughout the entire duration of field work. The methods and tools of data collection included observation, interview, focus-group discussions and case studies. The ethnographic in-depth interviews and case studies were selected purposively keeping in mind the objectives of the study. Valuable information was collected from both the secondary and primary sources.

The entire data collected during the ethnographic fieldwork research were subjected to analysis and interpretation. For eliminating biases and favours it was ensured that the findings were the result of the respondent's perception rather than the characteristics and preferences of the researcher. It was also ensured whether the key respondents preferred to be named in the research report or be given any pseudonyms.

The ethnographic method has its own limitations, as in this research method the quantitative nature of the data does not count as greatly as their holistic nature i.e. interpretation is done in terms of total context encompassing the phenomena. In other words, it tries to understand the social world from the point of view of respondents through detailed and contextual description of their actions and behaviour.

## **Ethnographic Profile of Idalbera Village**

The present study was conducted in Idalbera - one of the adopted villages of Tata Steel in Jamshedpur, Jharkhand. Idalbera village is situated on the banks of Swarnarekha river. It is located at a distance of 13 Kms. south of district headquarters of East Singhbhum (Jamshedpur town). From Simuldanga village on NH-33, it is interiorly located at a distance of 5 kms. The village is well connected by a motorable road for the nearest urban centre. The total area of Idalbera is estimated at 521.15 acres (Prasad & Kumar, 2013).

## **Social Structure of Idalbera Village**

The residential pattern of Idalbera village conforms to the general pattern as described above. The whole village is divided into various caste/tribal groups living in four localities – *Neech Para*, *Unch Para*, *Tetenga Basti*, and *Kenddih Tola*. The early and original settlers of the village are the tribals (Bhumij) who own majority of agricultural holdings and mainly live in *Neech Tola* which is on the fringe of the village near the *Swarnarekha* river. At the entrance of the village we find the *Unch Para* where the houses of Kurmis on both the sides of road are built in a clustered fashion. In the other two localities of the village - *Tetenga Basti*, and *Kenddih Tola* we find mostly the Yadavas, Telis, Lohars, Chamars and Nais. The details are provided in the following table.

Idalbera is a mixed group village comprising of 130 households of which 59 belong to STs; 56 households belong to OBCs, and 15 belong to SCs. The total population of Idalbera village is 698 of which 343 are males and 355 are females. Community wise distribution of population shows that STs are in majority with 318 persons followed by OBCs with 305 persons and SCs with 75 persons. The Sex Ratio (females per thousand males) in the village is 1035. The community structure of the population of Idalbera consist of 8 caste/tribals groups. These are Bhumij, Santhal (ST); Kurmi, Teli (oil processor) and Gwala-milkman (OBC); and Lohar (iron smith), Nai (barbar) and Chamar – leather worker (SC). Among the scheduled tribes Bhumij are in majority – numerically and economically. Similarly among the OBC Kurmis constitute a fairly large portion of the population next to Bhumij. Study reveals that agricultural land holdings wise Bhumij are more rich but have no education whereas the Kurmis (Mahto) have less agricultural land as compared to Bhumij but are educationally sound and are clever. Age group wise distribution of population at Idalbera village shows that majority (36.82%) of the population lies in the age group of 15-35 years followed by the age group of 36-60 years (21.78%) and 6-14 years (20.49%). Minimum percentage (6.02%) of population was found in the age group of above 60 years. The details about the localities and description of social groups at Idalbera village are provided in the following tables:

**Table 2. Community wise Distribution of Households and Population at Idalbera Village**

Localities of the Village	Community/Caste	Surname/ Sub-Caste	Category	No. of Households	Population
Neech Para/Tola	Bhumij	Singh, Munda, Sardar	ST	44	236
Unch Para / Mahto Tola	Kurmi	Mahto	OBC	32	173
	Bhumij	Singh	ST	04	22
Tetenga Basti	Lohar (Iron Smith )	Karamkar	SC	07	35
	Nai (Barbar )	Pramanik	SC	03	15
	Santhal	Manjhi	ST	07	38
	Teli (Oil Processor)	Gorai	OBC	07	37
	Gwala (Milkman)	Gaud, Gop	OBC	11	62
Kenddih Tola	Chamar (Leatherman)	Machchua	SC	04	20
	Gwala (Milkman)	Pradhan, Gaud	OBC	05	27
	Bhumij	Singh	ST	04	22
	Lohar (Iron Smith )	Karamkar	SC	01	05
	Teli (Oil Processor)	Gorai	OBC	01	06
<b>Total</b>				<b>130</b>	<b>698</b>

*Source: Primary data collected from field work, 2011*

**Table 3. Category and Gender wise Distribution of Households and Population of Idalbera Village according to 2011 Census**

Sl. No.	Category	No. of Households	Gender		Total (%)
			Male	Female	
1.	ST	59	156	162	318 (45.56%)
2.	OBC	56	150	155	305 (43.70%)
3.	SC	15	37	38	75 (10.74%)
<b>Total</b>		<b>130</b>	<b>343</b>	<b>355</b>	<b>698 (100.00%)</b>

*Source: Primary data collected from field work, 2011*

### **Educational Status**

It was found that majority of the villagers (46.7%) were illiterate and 53.3 percent were literates. Among the literates majority of the villagers (28.94%) were educated up to only class fifth. 15.19 percent had their education between class sixth to class ninth. Further, there were only 37 (5.3%) matriculates, 17 (2.44%) intermediates, 3 (0.43%) graduates and only 2 (0.29) post graduates in this village.

### **Occupational Status**

Idalbera is primarily an agrarian village. Since the Bhumij and Mahto are numerically preponderant, they own a large part of the village land. The values of land in an agricultural economy must be fully appreciated to understand the village economy. In Idalbera, land is not only a source of livelihood for majority of the villagers but also a symbol of material security and well being. Everyone in the village would like to possess more land than he has, for more land means more to eat and more comfortable margin on which one can attain both livelihood and luxuries. The occupational structure of Idalbera village depicts that 33.67 percent of the total workforce is engaged in cultivation, 40.96 per cent in agricultural labours, 22.86 per cent non-



agricultural labours, 2.01 per cent in service, and 0.5 per cent trade and commerce. Moreover, livestock such as ox, buffalo, cow, goat, sheep, hen, duck, etc. were found in 87 families. Overall participation rate for the village is 57.02 percent. The main workers in the village comprise of 31.95 percent whereas the marginal workers and non-workers are 25.07 percent and 42.98 percent respectively.

### **Drinking Water Resources**

The villagers collect water for drinking from hand pumps and wells. There are 7 wells in this village which are privately owned. Similarly, there are 3 private hand pumps. Besides, there are other hand pumps and wells constructed by the government also.

### **Irrigational Resources**

Idalbera is a rain dependent village for cultivation of crops and vegetables. However, the Swarnrekha river is a natural source of irrigation for those villagers whose agricultural fields are near the river. With the intervention of TSRDS one *Pani Panchayat* has been constituted comprising of 21 villagers. This *Pani Panchayat* has installed a lift irrigation with pumping set near the Swarnrekha river which supplies water for irrigation to its members. Now a days due to advancement some villagers (non-members of *Pani Panchayat*) also hire pumping sets from outside the village for the purpose of irrigation.

### **Banking Facilities**

Generally the villagers have their bank accounts in the nearby branch of Jharkhand Gramin Bank which is located at Mango in Jamshedpur. The villagers make their saving and loan transactions in this branch itself. In addition the village also has two Self Help Groups (SHGs) which act as banks for savings as well as provide petty loans to its members at minimal interest rate (Rs. 5 per Rs. 1000 per week).

### **Health Facilities**

The villagers of Idalbera go to the health centres at Simuldanga, Dimna and Mango to seek treatment for minor illness. For major illness the villagers go to Father (St. Joseph) hospital at Bhilaipahari or to TMH at Jamshedpur. However, the villagers also prefer to visit to doctors and hospitals for treatment to Govt. hospital Sakchi, Jamshedpur, Mercy Hospital, Harpal Singh Hospital, Mango, and other health centres at Pipla, Baridih, Simuldanga, Mukhiyadanga, Dhadkidih, Haldipukhur, Sidhulota, Lupung, etc.

### **Government Programmes**

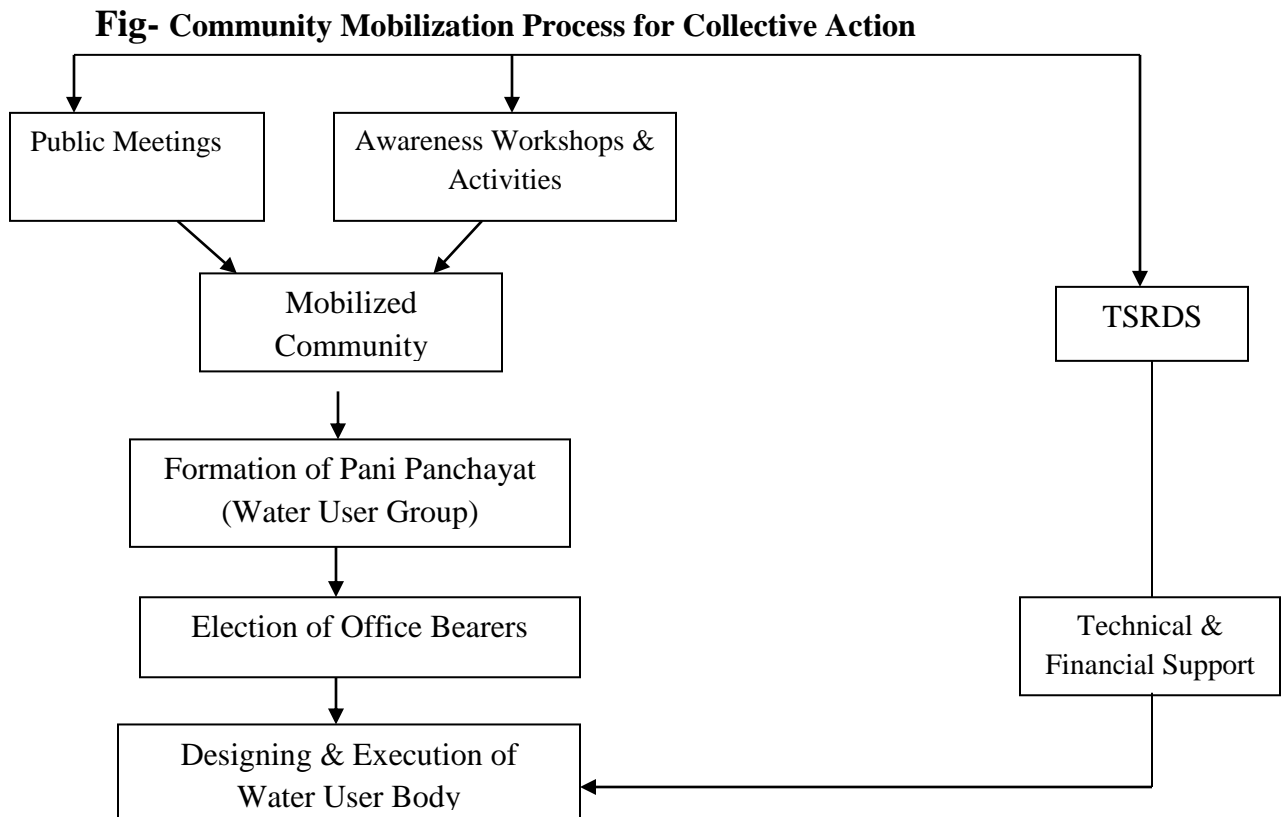
As usual, the village has generally remained left out so far as the benefits of government development programmes are concerned. Recently, ten persons, have been sanctioned old age pension scheme. Besides a few students of dalit community have got scholarships under the SC students scholarship programmes from the government. The National Rural Employment Guarantee Programme is not at work in the village; although, 39 persons have reported to have their 'Red Cards'. In Idalbera, about 119 households are electrified while 11 households have not got electricity facility.

## Village Leadership and Organizations

Earlier villagers of Idalbera were entirely dependent on the Kurmis of the village so far village leadership and organization is concerned. Under the circumstances of backwardness they could not develop any initiative nor could they be involved in risk taking activity. They did not have any time orientation nor could they plan for the future. But these days the struggle against exploitation has created considerable awareness in the village. The credit for all this goes to community leaders of the village like Negi Singh, Phanibhushan Mahto, Niranjana Singh, Jagarnath Singh, Debnath Singh, Duryodhan Singh, and others. Besides, these volunteers have so far managed to sustain this awareness, unity and social action.

## Intervention of Tata Steel for Water Resource Management through Collective Action

With the sustainable development approach, the Tata Steel Rural Development Society (TSRDS) attempted to influence village life from several angles, economic, social and cultural but – the emphasis was on economic activities. Roughly speaking, the work done by the TSRDS till 2011, shows three broad phases in the nature and tempo of the activities it pursued. Some of the activities like formation of SHGs, agriculture and irrigation through *Pani Panchayat*, medical assistance and sanitation services, continued and developed throughout the period but many others because of their once-for-all character or other causes, lasted for short periods.



### **The Preparatory Phase (1996-1997)**

This phase covered the first two years of the project during which Mrs. Shakti Sharma was directly responsible for the work at Idalbera. In this period, TSRDS was primarily occupied in determining Idalbera to be included in the project and ascertaining its felt needs and priorities. Accordingly, during this period, Negi Singh (Opinion Leader) first came in contact with some officials of TSRDS like Vishwanath Singh Sardar, Millu Sardar who belonged to Bhumij community and Felix Ekka (of Pipla Centre) and Shiv Shankar (of Bhilaipahari area). He explained to them the problems of his village and the need of development. Looking in to the matter these officials under the leadership of Mrs. Shakti Sharma made a visit in this village to learn their problems and plan for a need based development work. The visiting team found that due to lack of irrigation facilities agricultural fields of Idalbera is only rain dependent despite having a huge agricultural area. As a result the cultivators could only grow one crop in a year. To change the cropping pattern and agricultural produce the TSRDS team decided to help the villagers by installing a lift irrigation system on the bank of the river *Swarnrekha*. Accordingly, in 1997 the TSRDS officials started its initiative to establish lift irrigation facility at Idalbera in order to provide irrigation water to the farmers for agriculture.

### **Concentration on Selected Projects (1998-2006)**

Broadly speaking, from the year 1998, the TSRDS started concentrating mainly on water resource management through the installation of Lift Irrigation system (*Pani Panchayat*) and formation of Self Help Groups in Idalbera village. For the establishment of Lift Irrigation facility at Idalbera the farmers were requested to constitute a samiti and also contribute some amount for the proposal. Initially, the villagers did not agree for contribution but after a lot of explanation and understanding they agreed to do so. The villagers formed the society and named it as "*Swarnrekha Pani Panchayat*" (SPP) with considerable members of 20 farmers. The 20 members together contributed Rs. 20000 (Rs.1000 each). The secretary of TSRDS Mrs. Shakti Sharma, along with other officials came to Idalbera regarding the place where pumping set machine could be installed. Several meetings were held and then the TSRDS officials with the help of the *Pani Panchayat* members finalized the area near the river keeping in mind the nearness to the water resource and the coverage area of the beneficiaries. The villagers also provided labour force for the construction of well, irrigation shed and drainage system (furrows) for carrying the irrigation water to the low areas. The *Pani Panchayat* at Idalbera was inaugurated by Mr. Middhya, Head, TSRDS in July 1998 and the irrigation started in November 1998. Since then the lift irrigation water is used for vegetable growing only. Paddy cultivation is partly dependent on rain water harvesting. The Lift Irrigation usually does not function between July-November (rainy season) as due to rain the river is in full spate and the well gets submerged.

**Table 4. Idulbera Irrigation Project under Water Resource Management**

Name of the Project	Overall Impact of the Project		
<b>Idulbera Irrigation Project</b>	Village Summery	District	East Singhbhum
		Block	Golmuri cum Jugsalai
		Panchayat	Bhilaipahandi
		Village	Idulbera
		Total Population	415
		ST Population	214(51.6%),Bhumij tribe
	Location	13 kms south of Jamshedpur, on the banks of Swarnrekha river.	
	About Pani Panchayat	Name	Swarnrekha Pani Panchayat
		Formation	1998
		Total Members	21
		Group	Mixed group of tribals (20 Bhumij tribe) & one Backward Caste
Sponsoring Organisation	Project Funded by	L.D. Javeri Trust & TSRDS	
	Project promoted by	TSRDS	
	Cost Break Up	LDJ Trust- Rs.94,212	
		TSRDS-Rs.1,86,932	
		Villagers Contributions-Rs.1,75,820	
	Total Cost-Rs.4,56,964		
Current Status	403.5 bighas of land cultivated; members growing 3 crops (Rabi,Kharif & Jaid); farmers made a total profit of Rs. 3.04 lakh		

Source: TSRDS Office Records, Jamshedpur

### Findings and Analysis

To ensure that the stakeholders/PP members actively participate at all levels in the organization - a “water user group” or *Swarnrekha Pani Panchayat* has been formed consisting of the representatives from the beneficiary. This *Pani Panchayat* (water user group) acts as a platform of interaction among the members. The structure and function of *Swarnrekha Pani Panchayat* at Idalbera village is being provided in the following table:

**Table 5. Structure and function of Swarnrekha Pani Panchayat at Idalbera**

1	<b>Establishment</b>	The Idalbera lift irrigation was initiated in 1997 as a joint venture with L.D. Javeri Trust. The <i>Swarnrekha Pani Panchayat</i> was formed in 1998.
2	<b>Objective</b>	The prime objectives of the project was <ul style="list-style-type: none"> <li>• To provide assured irrigational facilities throughout the year</li> <li>• To promote growing of vegetables and other cash crops</li> <li>• To inculcate modern agricultural practices.</li> </ul>
3	<b>Design</b>	Swarnarekha River acts as natural perennial water resource. A pump set lifts the water from the well constructed on the banks of the river. Through pipeline of 2100 feet (500 feet underground pipe of 6 inch; 1600 feet pipe of 4 inch) the water is carried to the fields. There are three hydrants from

		which water is further distributed either through furrows (for low lands) or through portable pipes.
4	<b>Capacity of Machine</b>	8HP (Kirloskar Engine)
5	<b>Command Area</b>	Rabi: 25 acres, Zaid: 15 Acres
6	<b>Distribution Arrangement</b>	Through furrows for low areas & through pipes (4 inch & 3 inch pipes) for up lands.
7	<b>Composition</b>	At present the Pani Panchayat comprises of 21 tribals and OBC. Though the numbers of tribal are much more as compared to the numbers of OBC, no undue influence of any caste is seen in the group.
8	<b>Governing Body</b>	President, Vice-President and Operator cum Treasurer are the three posts. The posts are elective in nature though from the time of inception the same persons have held the post. During interview it was observed that the President and Vice-President did not have much role. The Treasurer in fact is the person who was responsible for informing the group regarding the money in the bank, the total expenditure, and where it has been spent, expenses in the repair of the machine etc. If some major expenditure has to be undertaken for repair of the machine or a part has to be replaced the operator raises the issue in the meeting and decision is taken.
9	<b>Governance and Decision making process</b>	Highly democratic, all the members irrespective of their land holding have their right to speak and have an influence on the decision making.  The matters raised during the meeting are; crops to be grown, repair of the pump set, marketing problems, distribution of water, etc. Any person can raise an issue during the meeting and the matters are discussed and every person is given an opportunity to have his say. Final decisions are taken either by consensus or by voting. The group is very cohesive and has a very good understanding for the needs of the other members.
10	<b>Meetings</b>	The meetings of the <i>Pani Panchayat</i> are held every month and the attendance is more or less 100% (in case of any member being absent another member of his family represents him). A contribution of Rs. 10/- per member per month is being collected during each monthly meeting.
11	<b>Distribution Pattern</b>	Through rotation system and priority for the need based
12	<b>Charges</b>	Initially the members and non members were charged differently. At present the charges for irrigation water supply are – Rs. 65/- per hour. This includes Rs. 20/- per hour as machine hiring charges (cost of Mobil and maintenance charges), Rs. 5/- per hour as operator charges and Rs. 40 per liter per hour as diesel charges or Rs. 25/- per hour as machine hiring charges + Diesel charges for both members as well as for non members inclusive of operator's charges.

		Apart from this it is the farmers (beneficiary's) responsibility to make the furrows and join the pipes etc. so that the water reaches his field. Usually the non –members do not get any chance to get water, as the LI system is busy supplying water to the members themselves who are given priority.
13	<b>Investment</b>	A total investment of Rs. 100000 out of which approximately 40000 (Rs. 20000 in cash & Rs. 20000 in the form of labour) was contributed by the beneficiaries.
14	<b>Operator</b>	The operator charges Rs. 5/- per hour. Apart from running the machine it is the duty of the operator to maintain the machine for which training to the operator has been given by TSRDS. For any major breakdowns money is withdrawn from the bank and is invested in the repair of the machine.
15	<b>Training to Farmers</b>	Several training programmes have been organized by TSRDS to provide agricultural training to the farmers of Idalbera. These programs have covered issues like good agricultural practices, use of fertilizers, HYV and pesticides, Crop demonstration, Social and Agro forestry etc.  After the training TSRDS adopted a methodology for promotion of Rabi Crops. In the first year (1999-2000) they provided seeds, fertilizers, Pesticides and spray machine at a subsidy of 75%, the next year (2000-2001) the subsidy was reduced to 50% and after that year the last subsidy was of 25% in the year 2001-2002.

**Source: Ethnographic Fieldwork**

### **Financial Transactions**

According to Debnath Singh, Vice-president of Idalbera Pani Panchayat, during the initial years the income from *Pani Panchayat* used to range from Rs. 10000 to Rs. 40000 per year excluding the maintenance charges. Till 2005 the income from the *Pani Panchayat* revenue used to be distributed equally among the members. The members used to get Rs. 500 to Rs. 2000 per head per month as profit share. But since last five years due to wear out of the pumping machine it is not able to take much load and as a result it breaks down frequently. Due to this most of the income is spent in the repair and maintenance of the machine and at times the members need to contribute from their pocket for the same. However, these days income from *Pani Panchayat* is hardly Rs. 1500 per year excluding the maintenance charges. According to the operator cum treasurer Taroni Singh this amount lies with the society and at time of crisis it is utilized for the repair and maintenance of the machine. He remembers vividly – “*during the marigold cultivation period the revenue of Pani Panchayat increases*” but last year we have not generated much revenue. This may be due to the lack of feeling of ownership, leadership and irresponsible behaviour of the members of the water user group.

In 2004-05 the machine broke down and stopped functioning due to over usage. Then Negi Singh along with other members again reported to TSRDS officials and requested them to provide a new machine. TSRDS at first did not show any interest but after a lot of persuasion it agreed to provide a new machine. The members contributed together Rs. 10,000 again and then

TSRDS provided a new machine in 2009. The lift irrigation system works from December-June every year.

### **Changes in Quality of Life through Collective Action and Water Resource Management**

In order to assess in quantitative terms, the nature and magnitude of the changes that have taken place in Idalbera village, as a result of the motivational activities of TSRDS for collective action. Information was collected for the year ending 2010-2011.

Those who had seen the village 18 years ago the change is visible even to the naked eye. The area under regular cultivation has increased in every beneficiary and a number of green patches dot the landscape even in summer due to intervention of *Pani Panchayat* through the initiative of TSRDS. Along with paddy and *kurthi*, the staple food crops of the people, which alone used to be cultivated till the nineties, a variety of new crops are grown now. *Pani Panchayat* irrigation system has played a key role in this transformation.

### **Changes in Cropping Pattern**

In the wake of the improvement of water resources and enlargement of irrigation facilities, the cropping pattern has registered a marked change.

**Table 6. Changes in Cropping Pattern**

<b>Agricultural Season</b>	<b>Baseline (Prior to TSRDS Intervention:1997)</b>	<b>After the intervention of TSRDS (Lift Irrigation facility)</b>
Kharif (June-Dec.)	Paddy	Paddy & Vegetables
Rabi (Dec.-Mar.)	Nil	Vegetables (Tomato, Onion, Brinjal, Potato, Cauliflower)
Zaid (Mar.-June)	Nil	Vegetables (Nenua, Jhinga, Louki, Karela, Barbati, Bhindi, Kheera)

*Source: Primary Data collected from Field Work, 2011*

In 1996, paddy was the only crop harvested by the farmers with a sprinkling of maize and onions. Commercial crops were practically unknown. Besides, the area under cereals is relatively inferior and devoid of irrigation facilities. The better quality land has been transferred to marketable crops including vegetables. Naturally, in terms of the value of production, which among others, reflects the quality of the land transferred to non-cereal crops, the change is much more conspicuous.

Prior to the intervention of TSRDS the farmers (except for one farmer – Phanibhushan Mahto who practiced double cropping) only grew one crop i.e. Kharif crop. During the rest of the year (Rabi & Zaid seasons) the farmers used to migrate to other places in search of job (labour). But after the intervention of TSRDS the members are now totally depended on agriculture throughout the year there by reducing the migration rate during Rabi and Zaid seasons. TSRDS started its intervention with contacting and organizing people. Awareness building was given prime importance. Prior to pump installation training on modern agricultural practices were given. Lying of pipes and hydrants followed this. Bank account of the *Pani Panchayat* was

opened. Crop demonstration and distribution of seeds was also done. During the study most of the beneficiaries responded that TSRDS has taught us to grow varieties vegetables by using irrigation water from *Swarnrekha* Lift Irrigation facility thereby doubling our yearly income. The villagers have learnt to be self dependent and self reliant from TSRDS. In the beginning monthly meetings were held with TSRDS officials to inform them about the monthly activities of the irrigation project.

The magnitude and duration of seasonal migration was due to causes which are familiar. Although the developmental activities initiated by the TSRDS, created part time employment opportunities, they were not enough to absorb all the surplus labour in the area. Management should take note of this. Seasonal migration enabled the beneficiaries to earn their livelihood and to create their productive assets – during the lean agricultural season, when productive activity in the village remained at a low ebb.

### **Increase in Yield and Income**

All the 21 members of *Pani Panchayat* have been benefited by the lift irrigation facilities provided by TSRDS. Prior to the lift irrigation system these members were only dependent on rain for paddy cultivation. The agricultural land after Kharif season used to remain fallow. Thus the members used to be hardly benefited from their agricultural land. The implementation of lift irrigation system has not only changed the cropping pattern but also the cultivation area which has increased by the introduction of Rabi and Zaid crops. It was found that almost all the members of *Pani Panchayat* are now getting benefited from their agricultural practices as their yield has increased (from 2.7 Quintal per Bigha to 5.5 Quintal per Bigha) thereby doubling annual profit. The operator of the lift irrigation system Shri Taroni Singh earns Rs. 5 per hour as operator charges. He has been provided training by TSRDS on maintenance, minor repairs, handling of funds and maintaining the accounts. All the members actively participate in the meetings of *Pani Panchayat* as most of them are benefited by it.

It was also found that there was an increase in agriculture practice (Kharif, Rabi and Zaid) of the members of *Pani Panchayat* of Idalbera village between 1997-2011. It was also found that the area under cultivation for Kharif season (paddy cultivation) has decreased as compared to 1996. The reason cited by the farmers was that the margin of profit from vegetables (Rabi & Zaid crops/vegetables) was more as compared to the paddy cultivation (Kharif crop). This change could not have been possible without collective action leading to the training and awareness programmes on issues like good agricultural practices, use of fertilizers, HYV and pesticides and crop demonstration, imparted by TSRDS along with installation of lift irrigation facility and distribution of seeds, fertilizers, pesticides and spray machine at a subsidized rate.

### **Allied Income Generating Activities**

Another interesting finding was that almost all the members of *Pani Panchayat* reared goats and had a small poultry farm apart from agricultural practice. These also supplemented their income. When asked about goat rearing and poultry farming the respondents said that this income acted as fall back during the bad times.



## **Changes in Consumption Pattern and Food Security**

The consumption pattern of the family has also undergone change. Now there is no food insecurity in the families of *Pani Panchayat* members as the farmers grow more paddy and vegetables which last a longer period. Moreover, now days we find accessories like TV, cycle, electric fans, etc. in their houses which earlier was not seen. They are also spending adequately on festivals and on the education of their children.

## **Women Empowerment**

The impact of the formation of *Pani Panchayat* and installation of lift irrigation system as a result of collective action was also found among the women folk as they have been very much involved in the project by TSRDS. Prior to the lift irrigation project women were only involve in their household chores and at the most worked as casual labourer. But post lift irrigation project the women have formed a Self Help Group (SHG). The members of SHG have taken a land on lease (2 bighas) and they do floriculture almost every year which fetch them an annual income of Rs. 20000 – 30000. The women are now happy as they are also engaged in income generating activities. They feel that although their work load has increased but they don't mind putting the extra effort apart from household chores as they no longer have to work for anyone else outside the family. The intervention of TSRDS and its outcome has empowered the women of Idalbera and strengthened their role in decision making which is reflected more through self help group activities. The details of the impact of SHG on women have been dealt in the next section.

## **Self Reliance and Sustainable Development**

The TSRD'S stimulation for collective action formed the *Pani Panchayat* and installed the Lift Irrigation system at Idalbera in 1998. The members were provided awareness and training on issues like good agricultural practices, use of fertilizers and pesticides, etc. and also provided seeds fertilizers and pesticides at a subsidized rate for only first three to five years. After that the TSRDS gradually started withdrawing from the village. The members of the *Pani Panchayat* gained heavily from the training and other interventions of TSRDS. As a result the members have been holding regular monthly meetings and participating actively. They are taking good care of their maintenance fund which has been created by the members for major repairs and replacement (if necessary) of the machine. No money is due at the charges for the water is collected in advance by the operator. From 1998-2010 the pump set (8 HP) has been repaired many times and replaced twice (once in 2003 and again in 2009). In the first time the machine was replaced by purchasing a second hand machine with the help of contributions made by the members themselves i.e. without

any support from any organization or Bank. However, in 2009 the machine was replaced by a new one by arranging funds partly from the members and partly by the contributions made by TSRDS. It was found during the interview with *Pani Panchayat* members that they are ready to generate resources (funds) by common pool for the purchase of new machine in case of any mishap in future.

Now TSRDS has stopped giving any subsidies for seeds, fertilizers, etc. and are out of sight from the village but the group is still maintaining and doing well. With the passage of time, some of the *Pani Panchayat* members have been replaced due to their death. The group members have been repaying all its dues and have been conducting meetings regularly. There is a good

understanding among the group members. The operator has over the years gained good technical knowledge and is an expert of machine repair. The group has now become self reliant as the members are now making more profit by practicing agriculture as their main occupation. The budding self reliance among the members of *Pani Panchayat* indicate towards sustainability in the near future.

### **Case Study - 1**

**Niranjan Singh Sardar** (Male, 50 years, Eighth pass) is a farmer by profession. He is also ward member of Idalbera village Panchayat. His wife is the AWW of this village. He has four sons and one daughter. One of his sons are working as laboratory attendants in the RVS College of Engineering and Technology. The other children are students and seeking education from nearby school and collages. He is having 18 bighas of agricultural land. Besides he has a small mango and guava orchard. Prior to lift irrigation project at Idalbera he could not grow much crops in his agricultural fields as his land was not fertile and there was not enough water during summer season (cultivation was only rain dependent). As a result he could only cultivate paddy in his fields and his agricultural yield was very low. But after the TSRDS intervention in terms of lift irrigation project and agricultural training his life has changed. As a result of agricultural training he uses modern technology in his agricultural practices. With the help of irrigation facility from the Pani Panchayat he has made agriculture as his prime occupation. From mono cropping he has moved to double and triple cropping. Earlier out of 18 bighas of land he could only make use of 10 bighas for paddy cultivation during Kharif season only. In the rest of the year his land used to remain fallow. But now he is practicing three crops in a year. In Kharif season he cultivates paddy and in Rabi and Zaid season he goes for vegetable cultivation in the remaining 6 bighas of land with the help of lift irrigation facility and good knowledge about agricultural practices. Now he is involved in paddy cultivation for six months and then another six months in vegetable production like cauliflower, cabbage, tomato, ladyfinger, brinjal, *barbarti*, etc. This has been made possible due to the irrigation facility that was introduced by TSRDS in 1998. Despite last year being the rainfall deficient season, water was available for the Pani Panchayat members to harvest their crops. There is no doubt that the lift irrigation facility has led to an increase in the total area under cultivation. Moreover, as a result of training provided by TSRDS Niranjan Singh is making best agricultural practices and the land's fertility has also improved. *“Earlier I was making only seasonal profit but now I am profiting throughout the year,”* said Niranjan Singh when asked about the difference the Pani Panchayat programme had brought to his life.

### **Case Study - 2**

**Taroni Singh** (Male, 45 years, Ninth pass) is a farmer by profession. He is also the operator cum cashier of the *Pani Panchayat* at Idalbera. He lives with his old mother, his wife and his four small daughters. He has 7 bighas of land and he is busy throughout the year in cultivation. He cultivates paddy during *Kharif* season and vegetables in the Rabi and Zaid seasons. During the interview he said *“earlier my land would remain fallow and the crops that would grow were of very poor quality. I used to be involved in agriculture only for six months in paddy cultivation. For the next six months I used to go out in order to work as wage labour. But now with the formation of Pani Panchayat and lift irrigation system I am able to cultivate vegetables as well. Now due to availability of irrigation facility the land is very fertile and productive. Moreover, the same land can be used to grow different variety of crops throughout the year. Apart from our personal consumption, now I am able to sell vegetables at a profit as much as Rs. 20,000 each year. This gives us additional revenue so that we*

*can save and we are saving Rs. 5500 per year”*, said Taroni Singh. This change in Taroni Singh’s life is attributed to the formation of *Pani Panchayat* and installation of lift irrigation system by TSRDS. His consistent hard work and the fruits of training provided by TSRDS long back has made him confident and self dependent and he is happily living his life with his family and enthusiastically raising his four small daughters for their better future.

## **Conclusions**

As a result of collective action the socially excluded group of the village has undergone major changes during the years in term of their quality of lives. The single crop areas of the village beneficiaries have been turned into double crop areas. Credit goes to the *Pani Panchayat* society of the village. Another noteworthy feature of change due to collective action was a rather satisfactory growth in agricultural production and income. SHGs formed as a result of collective action of the villagers have empowered the women beneficiaries and their earnings have increased to a considerable extent. It may be said that TSRDS intervention has helped the socially excluded groups of Idalbera village in improving the life and level of their living, if not entirely at least to a significant level. The beneficiary group at Idalbera has stood the test of time to certain extent as they are earning and the major income source of the families is now agriculture (including vegetable cultivation) which was earlier in neglected status. The efforts put in by TSRDS and its outcome has in a very tangible way empowered women beneficiaries and strengthened their role in decision making not only is domestic domain but also in public domain. The villagers are now having more income now which is reflected in their expenditure on education, health, happiness, etc.

The chief objective of the TSRDS was an integrated and sustained development of the villages through collective action side by side with the large investment in physical assets. As the villagers themselves are the main architect of their progress it is essential to encourage and develop self-reliance among them to the maximum extent. The TSRDS was conscious of this requirement and, therefore, insisted on local contribution as a part of collective action for each of the project and activities it started. Medical assistance alone was offered free of cost for a long time. However, from the study it emerges that there is need of a high priority towards the improvement of human resources. But the vital importance of this factor for the rapid and sustained progress of Idalbera has not been adequately realized.

However, there has not been much noticeable change in the attitude and outlook of the respondents. The desire to be self reliant and to do hard work is weak. The work in the line of promoting the *Pani Panchayat* to an institutional status suffered heavily for want of a proper organizational set up in the village for planning and execution. Barring a few exceptions it was unfortunate to have the services of competent coordinator and worker who lived in the village and identified himself with the villagers he lived with. However, no effort was made to organize him in order to make him function as a team member. However, the fact remains that the WUG created a more focussed impact and established models for replication in other parts of the district.

There is no doubt that TSRDS entered Idalbera village with rural development activities especially with the installation of Lift Irrigation system (*Pani Panchayat*) and the formation of SHGs but they had sustainable development approach in their mind which propagates self dependency and self reliance in the long run. Accordingly, after the training to the members of

*Pani Panchayat*, TSRDS adopted a methodology for promotion of Rabi Crops by giving a subsidy policy in the distribution of seeds, fertilizers and other agriculture related requirements. In the first year (1999-2000) they provided seeds, fertilizers, Pesticides and spray machine, containers for storing yield (drums) at a subsidy of 75%, the next year (2000-2001) the subsidy was reduced to 50% and after that year the last subsidy was of 25% in the year 2001-2002. According to the beneficiaries respondents TSRDS has stopped giving any subsidy on seeds and fertilizers after 2002.

However, the findings reveal that even there is a strong sense of identity and social bounds among the villagers/beneficiaries there are tendencies to evade individual responsibilities and violate the rules governing the collective goods. A minimal set of regulations and institutions stimulated from outside (in this case TSRDS) is therefore necessary to encourage collective action. In other villages where collective action is more unlikely to occur spontaneously at the local level, intervention at a higher organizational level (state or national) may be necessary as the resource is to be managed sustainably for the benefit of all. The danger is that such outside intervention has often met with failure, especially where benefits remain difficult to quantify, or where local groups incur costs but are not subsidized by a wider group of beneficiaries.

Nevertheless, there is a need of developing a culture of ownership as it would lead to responsibility for the repair and maintenance of the pumping set along with its accessories. There is also a need of creating an environment where it will be possible to foster and nurture leadership qualities for promoting sustainable development and social justice in the tribal villages of Eastern India.

## References

- Areeparampil, M. (1989). Industries, Mines and Dispossession of Indigenous Peoples: The Case of Chotanagpur. In Walter Fernandes and Enakshi Ganguly Thukral (eds.) *Development, Displacement and Rehabilitation*. New Delhi: Indian Social Institute, pp. 13-88.
- Beteille, A.(1966). *Caste, Class, and Power, Changing Patterns of Stratifications in a Tanjore Village*. Bombay: Oxford University Press.
- Ibid
- Chambers, R. (1980). Basic Concepts in the Organization of Irrigation. In E. Walter Coward, Jr. (ed.) *Irrigation and Agricultural Development in Asia*. London: Cornell University Press.
- Census of India, 2011, Jharkhand State Series.
- Ekka, A. (2011). "The Tribal Vision of Life: A Key for Sustainable Development", paper presented during the First Bogaert Memorial Lecture at Xavier Institute of Management, Jabalpur, Madhya Pradesh, India on 15<sup>th</sup> January, 2011.
- Ensminger, J. (1998). Anthropology and the New Institutionalization. *Journal of Institutional and Theoretical Economics (JITE)*, pp. 774-792
- Gandhi, M. K. (1961). *Constructive Programme Its meaning and place*. Ahmadabad. Navajivan Publishing House.
- Haridas, V. R. (2005). *Soil & Water: The Cradle of Life*. New Delhi: Centre for Environmental Studies for Social Sector (CBCI Centre).
- Hunt, R.C. and Hunt, E. (1976). Canal Irrigation and Local Social Organization, *Current Anthropology*, 17 (3), September, pp.389-411.

- Jayaraman, T.K. (1981). Farmer's Organizations in Surface Irrigation Projects: Two Empirical Studies from Gujarat, *Economic and Political Weekly*, XVI (39), September 26, pp.A.89-98.
- Kumar, S. (2014). 'Ethnographic Research: Holistic Understanding of Human Behaviour through Text and Context. *Jharkhand Journal of Development and Management Studies*, Vol. 12 (1).
- Kumar, R. (2005). Revival of Traditional Rain Water Harvesting Techniques in Hydraulic Society: Case Study of Rajasthan. *Jharkhand Journal of Development and Management Studies*, Vol. 3, No. 2, pp. 1431-1452.
- Narayana, D.; Ratnam, V.C.V. and Nair, N. (1982). An Approach to Study of Irrigation: Case of Kanya Kumari District, *Economic and Political Weekly*, XVII (39), September 25, pp. A.85-102.
- Olson, M. (1965). *The Logic of Collective Action*. Cambridge: Harvard University Press.
- Ostrom, E. (2000). Collective Action and the Evolution of Social Norms. *Journal of Economic Perspectives*, Vol. 14, pp. 137-158.
- (1998). A Behavioural Approach to the Rational Choice theory of Collective Action: Presidential address, American Political Science Association, 1997. *American Political Science Review*, 92: 1-22.
- Prasad, A.(2009). Sarvodaya Movement: Developing a Macro Perspective from Grass-roots Collective Actions, in *Management in Government*, January-March.
- Prasad, A. & Kumar, S. (2013). 'Poverty Alleviation through Corporate Social Responsibility Policy: An Ethnographic Study of Tata Steel Initiatives in a Jamshedpur Village'. *Jharkhand Journal of Development and Management Studies*, Vol.11 (2): 5297-5323.
- [http://www.icra-edu.org/objects/anglolearn/Collective\\_Action-Key\\_Concepts\\_\(new\).pdf](http://www.icra-edu.org/objects/anglolearn/Collective_Action-Key_Concepts_(new).pdf)  
Accessed on 28<sup>th</sup> April, 2015
- Sinha, V. (1981). "Management of Chak Affairs," Paper Presented in Workshop on problems and Research Methods in Irrigation Systems Related to Chak (outlet) Requirements. Varanasi: Gandhian Institute of Studies.
- Wade, R. (1979). The Social Response to Irrigation: An Indian Case Study, *the Journal of Development Studies*, 16 (1), pp.3-26.
- Wittfogel, K. (1957). *Oriental Despotism: A Comparative Study of Total Power*. New Delhi: Yale University Press.