The impact of Minor Irrigation Projects on Economic Development in Selected Six Tribal Majority Districts of Jharkhand, Orissa and West Bengal

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Subrata Kumar Kundu

Study of the impact of minor irrigation projects on economic development in six tribal majority districts of Jharkhand, Orissa and West Bengal.

In capsule:

Coverage

State	**:**	**Jharkhand,**	**Orissa**	**West Bengal**
Districts	:	Gumla, Paschim Singbhum	Keonjhar Mayurbhanj	Bankura Purulia
Households	**:**	1,000	1,000	1,000
Population	:	4767	5302	4978

Findings:

Average land area sown per household	**:**	2.01 acres
% area irrigated	**:**	**0.9 acres**
Acquisitions by households up till 2000-01		
Clocks / watches	:	1544
Radios/ transistors	:	918
Cycles	:	2496

Posers

Can these tribal households with a land holding of 2 acres per household be brought to the doors of economic development?
if so, how,
and in how many years.

Gramin Vikas Sewa Sanstha

Executive Summary

The Project proposal

A proposal for the conduct of survey was submitted to BC & TD Division of the Planning Commission for covering 6 tribal districts of Jharkhand on sample study basis. The proposal was examined in the Planning Commission (P.C.) and it was considered prudent if instead of studying 6 districts of one state of Jharkhand, the same number of districts be spread over in the adjoing states of Orissa and West Bengal in such a way that each state gets represented by 2 districts each for assessing the impact of minor irrigation projects. However the Planning Commission opined that the focus could remain on tribal population for the study.

In pursuance to the advise of the Planning Commission the proposed area of the study was revised to cover 2 districts each in the 3 states of Jharkhand, Orissa and West Bengal. The selected 6 districts were : Gumla and West Sinbhum (Jharkhand) Keonjhar and Mayurbhanj (Orissa) and Bankura and Purulia (West Bengal).

Methodology

The precondition of the predominance of the Scheduled Tribes population as the subject population of study and the criterion of adjacency and contiguity of the area for the study did not permit applicability of random sampling technique as envisaged in the original project proposal. Therefore, purposive sampling was adopted for selecting requisite number of districts, C. D. Block and Villages.

While selecting C. D. Blocks in a district, care was taken to ensure characteristics of representative ness of the selected districts through the

selection of blocks. Therefore, the adjacency of the blocks was avoided for maintaining representative character of the selected block by maintaining even spread of the distance among the selected blocks.

The feelings of the neglect of the “little population” villages were well kept in mind while selecting requisite number of villages for the Survey. Due consideration was, therefore, given to include “little population” villages with pre-dominance of scheduled tribes population while selecting sample of villages. Purposive sampling technique, was, therefore, applied for selection of villages as well.

Objectives of the Survey

The survey was conducted to assess the impact of economic development in those sampled areas that were pre-dominantly inhabited by Scheduled Tribes and where minor irrigation works were operative. The impact was to be assessed through the following main indices:

- Increase in area irrigated.
- Gap between irrigation facility and irrigation needs.
- Change in income, if any due to increased potential.
- Vertical movement of the population in levels of living.
- Enhancement in the facility of drinking water.
- State and status of minor irrigation projects in the area under study.

A set of schedules was prepared for collection of the relevant data from the respondents. The three-tier mode of enquiry was adopted for the Survey. Accordingly, three different schedules of enquiry were devised, one for the C.D. Blocks, the other for the Villages and the third for the Households selected for the Survey.

A two-days training programme was conducted for the 6 investigators selected for the pre-test. The trainees were acquainted with the terminology and the concepts adopted in all the 3 schedules. The Pre-test was started on Friday, the 8th August 2003.

The exercise of Pre-test revealed that the information pertaining to the land use, sources of irrigation, the launch and completion of minor irrigation works for the concerned block was not available in the Block Office. Our investigators, however, felt positive about the availability of the desired information of the block in the Block Office itself. They failed to get any information for the block despite repeated efforts from the Block Office of the concerned block either in Jharkhand or in West Bengal.

For Jharkhand, it was learnt that the relevant records have yet to be transferred from the parent state of Bihar. For West Bengal, the block officials did not advance any plausible reason for non-availability of the records. General apathy of the staff, perhaps, explained the reason for not parting with the required statistics. Some information however, became available in the Patna C D Block Office, Orrisa.

Field Investigators were sensitized to deal with the respondents carefully by winning their confidence. Investigators were also advised to exercise patience on the questions where elements of recall and reluctance were involved.

Note of Caution

Since the respondent population belonged to scheduled tribes, investigators were advised to exercise extra caution in canvassing the schedules. They were also advised not to utter any thing or do anything, which might hurt their feelings.

The Selection of Sample

A total of 3000 households were selected for the Survey. As the sample aimed at studying the impact of minor irrigation projects on Scheduled Tribes population only, all the 3000 selected households belonged to these tribes. These households had a total population of 15,047 of which 7732 were males and 7315 were females. This population came from 72 villages.

Results of study

The survey revealed some interesting results regarding ground realities pertaining to the occupations, size of households, proportion of area irrigated sources of irrigation, potential of area irrigated at the start and the end points of reference period, work participation rate, functionality status of minor irrigation projects indication of impact on economic development levels of literacy and other related characteristics.

The findings in brief were:

General

- ✓ Average land area sown per household: 2.01 Acres.
- ✓ Irrigated area as % of area sown was: 45%
- ✓ Among the sources of irrigation, ground water sources formed: 82%
- ✓ But the area irrigated by ground water sources (82%)

Modes of irrigation

Ground water as a major source of irrigation was prevalent only in 3 C.D Blocks (Harichandanpur and Ghatgaon) in Orissa and one block (Khuntpani) in Jharkhand.

Ground water as a source of irrigation was virtually non- existent in 5 C.D. Blocks where area irrigated by ground water was found to be below 10%. These blocks were 3 in West Bengal (Manbazar I, Bandwan and Hirbndh) and one each in Jharkhand (Sadar Chaibasa) and Orissa (Kuliana).

Flow irrigation as a major source was prevalent only in 3 C.D.Blocks out of 18 covered. These were 2 in West Bengal (Khatra I and Bandwan) and one in Jharkhand (Gumla).

Flow irrigation was non-existent in 2 C. D. Blocks, one each in Jharkhand (Raidih) and Orissa (Patna). The % of area irrigated was found to be less than 10.

Lift irrigation was the major source of irrigation in the areas surveyed under 9 C.D. Blocks. These were 3 in Jharkhand (Gumla, Sadar Chaibasa,and Raidih) 3 in Orissa (Patna, Samnakhunta and Kuliana) and 3 in West Bengal (Hirbandh, Ranibandh and Manbazar I). More than 50% of the area cultivated was found to be irrigated in these blocks.

Dysfunctional Minor Irrigation Projects

About 60% - 63% of the tube wells were found dysfunctional in the areas covered in Jharkhand. The dysfunctionality rate was found to be lowest in the survey areas of West Bengal. It ranged between 8% to 13%.

The dysfunctionality rate of tube wells was found to range between 20% to 34% in Orissa.

More than 2/3rd of ground wells and dug wells were found to be dysfunctional in the areas covered in Jharkhand, Orissa and West Bengal. Mayurbhanj in Orissa with 49.5% of dysfunctionality rate was found to be with the lowest rate.

The causes for dysfunctionality were found to be lack of mechanical/ electrical repairs, sources got dried up, need for desiltation, destroyed, abandoned etc.

Govt. officials, slackness and lack of financial sources by the cultivators were responsible for increasing the rate and duration of dysfunctionality.

Dependency Burden

The occupational distribution shows that about 34% were engaged in cultivation and 29% did not pursue any income generating activity but were engaged in household duties. Of the remaining, about 28% were found to be students. An analyses by sex showed that there were vast differences between males and females in pursuit of income generating activities.

The survey revealed that more than one third of males (35.7%) and most of the females (97.3%) were non–workers. The survey also revealed agriculture was the only occupation, which has become their way of life. This occupation seems to be the only source of their existence.

Adequacy of available Irrigation Potential

The survey revealed that the irrigation facilities not only remained poor but also failed to enhance over the period of 5 years (1995-96 to 2000-2001) under study. It is also observed that out of 18 blocks studied, only 6 blocks could irrigate more than 50% of the area. Out of these, 4 were located in West Bengal and 2 in Orissa. The blocks which could irrigate more than 50 % of the area sown were Kuliana and Samakhunta in district Mayurbhanj. (Orissa), Hirbandh in district Bankura (West Bengal), Manbazar I, Manbazar II and Bandhwan (also in West Bengal).

All the 6 blocks in districts Gumla and Paschim Singbhum (Jharkhand), all the 3 blocks in district Keonjhar (Orissa), one block in district Mayurbhanj (Orissa) and two blocks in district Bankura (West Bengal) remained poorly served in the matter of irrigation.

A perusal of the index of area sown in 2000-01 over 1995-96 showed that the area sown has remained same over the period of 5 years in all the blocks except in Khatra I and Hirbandh (both in district Bankura) in West Bengal where there has been slight increase.
There has not been any noticeable change in the area sown over the last 5 years, which could be termed worst record.

The quantum of unmet needs also remained almost same. The 'met' needs and the 'unmet' needs in irrigation remained same, both, in 1995-96 and after 5 years, in 2000-2001.

Broad recommendation

1. Arrangements be made on priority basis for meeting their un-met needs by ensuring the working of all existing minor irrigation works including those which have been either lying idle for want of repairs or abandoned.

2. There is an immediate need for creating wells in the following blocks, as ground wells were not found there:

Palkot	(Gumla)
Jhinkpani	(West Singbhum)
Samankhunta	(Mayurbhanj)
Khatra I	(Bankura)
Ranibandh	(Bankura)

There is a need for additional wells in the following development blocks listed in order of priority:

Kuliana	(Mayurbhanj)
Hirbandh	(Bankura)
Bandhwan	(Purulia)
Sadar Chaibasa	(West Singbhum)
Manbazar I	(Purulia)
Patna	(Keonjhar)
Bangriposi	(Mayurbhanj)

3. The concept of the Beneficiary committees has not found favour with almost all the households. This needs modification so as to make it acceptable to the cultivating households.

4. Lack of proper monitoring and maintenance of minor irrigation works, specially in tribal inhabited areas should be made punitive for the officials assigned with this task. The room for leniency has resulted in high rate of dysfunctionality of the irrigation works.

5. For increasing the proportion of consumptive use of available water, it is recommended that Water Users' Committees should be constituted representing few villages say 5 or so. This committee should look after the impounding of rainwater by ensuring proper erection and maintenance of bunds, embankments, drains, nalas so that the wastage of rainwater could be minimized.

6. For arresting out flows of rainwater on the ground and also from over flows of rivers, canals and streams etc., tiny dams say of 0.5-1 hac capacities should be constructed. Tiny dams scattered over the areas instead of one large one at one place would ensure easy access to water, even distribution of water, easy conveyance of water and prevent water losses

from the point of delivery to the service pointed in the fields. Besides, a network of tiny dams would be a good source of recharging the vast land around them.

It is held that 10 tiny dams of one hac. Capacity can collect more water and in more quick time they one big dam of 10 ha. Capacity.

7. Cultivators should be encouraged to dig large sized Water Collection Katcha Pits (rectangular pits) in their fields for creating additional source of water to be used, both for irrigation and for farm cattle. This is being suggested because this side of the country receives a good average rainfall around 1250 mm and abundant water becomes available for use except in Purulia

8. Keeping in view the characteristics of the survey areas such as small holdings, less irrigation, massive illiteracy, poor economic status, traditional cultivation, non-participation of females in work, it is felt that there is an urgent need for developing a second vision which could generate income for providing humane living condition. GVSS recommends that a shift is cultivation pattern should be introduced in these areas for generating higher income from the existing holdings.

   Replacement of cultivation of traditional crops by Medicinal Herbs Cultivation should be taken up. The Govt. should develop a programme of cultivation of herbs and also for developing herbal durng industry.

   There is also ample market for developing “floriculture”. The developments of floriculture will turn this area of smallholdings into vast land of flowerbeds, which would generate returns in gold from the greens.

Cultivation of aromatic plants should be encouraged. Aromatherapy as a stream of alternative medicine has come to be accepted by vast majority.

Encourage agriculture related vocations like animal husbandry, hatcheries,

Encourage the families of cultivators who, for most of the time remain without any work to take up non-agricultural vocations such as.:

- Folk metal craft under which several decorative and utility articles can be made. The still is available in plenty among these folks.

- Rural industry such as handloom, khadi, rope making, paper **mache, tribal** handicrafts etc.
- Production of aromatic flavours**, scents** and herbal extracts.
- Preparation of Folk paintings for which these tribals are quite knowledgeable.
- Preparation of hand moulded models of terracotta crafts, metal wares etc.

Study of the Impact of Minor Irrigation Projects on Economic Development in Six Tribal Majority Districts of Jharkhand, Orissa and West Bengal.

Chapter I The Project Proposal

The **Gramin Vikas Sewa Sanstha (GVSS)** proposed to conduct a survey for studying the Impact of Minor Irrigation Project on the Economic Development in Six Tribal districts of Jharkhand. This study was deemed necessary because of the following factors:

- Jharkhand is the only state with primarily an agricultural way of life as 97.8% of its total area is rural.
- Jharkhand, earlier being a part of the bigger state of Bihar, might have escaped the needed attention for the development of its agriculture as Bihar itself was listed in one of the 4 Bimaru (sick) states of India. The other Bimaru states are Madhya Pradesh, Rajasthan and Uttar Pradesh.
- Water being the lifeline of agriculture for irrigation, the role of irrigation in the primary economic development cannot be minimized.
- The fact file of Jharkhand reveals that only 48% of its area was cultivated and of the cultivated area only 9% was irrigated.
- Irrigation being negligible, drought has been a periodic threat to this area.

As is obvious, major irrigation projects require long-term heavy investments in terms of capital, land acquisitions, heavy machinery and equipments and long gestation periods, Minor irrigation projects on the other hand require less investment, lesser land acquisition problems and provide quick irrigation facilities and sustenance to those engaged in cultivation it also stalls periodic threats of famines to the people.

The Govt. of Bihar, therefore, has been very enthusiastic about minor irrigation schemes and created an independent set up “Minor Irrigation Department” in December 1978 for facilitating speedy implementation of minor irrigation projects for the benefits of the farming community throughout Bihar.

In the context of above, it is expected that Minor Irrigation Projects should have benefited the areas now forming Jharkhand as apart of normal dispensation through the operation of these schemes. The expectation of normal dispensation of the benefits of minor irrigation schemes to the cultivators of 6 tribal majority district of Jharkhand prompted GVSS to propose the survey for assessing the impact of these schemes on the economic development of the project area.

Accordingly, a proposal for the conduct of survey was submitted to BC & TD Division of the Planning Commission for covering 6 tribal districts of Jharkhand on sample study basis. The proposal was examined in the Planning Commission (P.C.) and it was considered prudent if instead of studying 6 districts of one state of Jharkhand, the same number of districts be spread over in the adjoing states of Orissa and West Bengal in such a way that each state gets represented by 2 districts each for assessing the impact of minor irrigation projects. However the Planning Commission opined that the focus could remain on tribal population for the study.

The advise of Planning Commission was welcome as it would cover areas of 3 adjoing states with a total of 6 adjacent districts with the rational of cost effectiveness and time effectiveness and also the underlying expectation of discovering the variations in the impact among the three states.

In pursuance to the advise of the Planning Commission the, proposed area of the study was revised to cover 2 districts each in the 3 states of Jharkhand, Orissa and West Bengal.

1.1 Objectives

The survey was conducted to assess the impact of economic development in those sampled areas that were pre-dominantly inhabited by Scheduled Tribes and where minor irrigation works were operative. The impact was to be assessed through the following main indices:

- Increase in area irrigated.
- Gap between irrigation facility and irrigation needs.
- Change in incomes, if any due to increased irrigation potentials.
- Vertical movement of the population in levels of living.
- Enhancement in the facility of drinking water.
- State and status of minor irrigation projects in the area under study.
- And status of educational level of the young population amongst the subject population.

1.2 Sampling Design

The precondition of the predominance of the Scheduled Tribes population as the subject population of study and the criterion of adjacency and contiguity of the area for the study did not permit applicability of random sampling technique as envisaged in the original project proposal. Therefore, purposive sampling was adopted for selecting requisite number of districts, C. D. Block and Villages.

In the first instance, 2 districts from Jharkhand were selected with pre-dominance of Scheduled Tribes population. The clue for selection was provided by the information contained in publication of Census of India. The remaining 4 districts (2 each from Orissa and West Bengal) were selected in view of adjacency to each other and also the prevalence of Scheduled Tribes population. In accordance to the above scheme the sample size finalised on the basis of the purposive selection is given in statement I.I below.

Statement I.I: Number of districts C. D. Blocks and villages selected

State	No. of districts selected	No. of C.D. block selected	No. of villages selected
Jharkhand,	2	6	24
Orissa	2	6	24
West Bengal	2	6	24
Total Sample	**6**	**18**	**72**

According to the scheme of the study project, 2 districts each were selected from three states of Jharkhand, Orissa and West Bengal, making a total selection of 6 districts. From each selected district, 3 C. D. Blocks were to be selected making a total selection of 18 C. D. Blocks. And finally, 4 villages were required to be selected from each selected C. D. Block.

For selecting of sample of C. D. Blocks and Villages, it was considered necessary to have a feel of the local knowledge about the setting up of minor irrigation projects and the villages fed by them.

It was also necessary to locate the requisite number of such villages, which besides being benefited by the launch of the minor irrigation projects also had pre-dominant population of scheduled tribes.

It is well known that concentration of sample units in a particular area destroys the character of representativeness of the area to a large extent. Representativeness of the selected units in the survey can be ensured by resorting to the even spread of the sample units by maintaining reasonable distance among the selected sample units. Therefore, while selecting C. D. Blocks in a district, care was taken to ensure characteristics of representativeness of the selected districts through the selection of blocks. Therefore, the adjacency of the blocks was avoided for maintaining representative character of the selected block by ensuring even spread of the distance among the selected blocks.

In each district of Jharkhand, Orissa and West Bengal one block has been treated as central block and the spread of the distance has been reckoned from that central Block.

Statement 1.2 gives the approximate distance between the central block and selected blocks.

Statement 1.2: Approximate distance from the central block to the blocks selected in the sample

State/District/Block	Name of the central block	Approximate distance from the central block (Km)
Jharkhand		
District: Gumla		
Gumla Sadar	Gumla Sadar	0
Palkot		20
Raidih		42
District:Paschim Singbhum		
Jhinkpani		22
Khuntpani		18
Chaibasa Sadar	Chaibasa Sadar	0
Orissa		
District: Keonjhar		
Ghatgaon	Ghatgaon	58
Harichandanpur		15
Patna		58
District : Mayurbhanj		
Bangriposi		35
Kuliana		36
Sanmakhunta	Sanmakhunta	0
West Bengal		
District : Bankura		
Khatra I	Khatra I	0
Hirbandh		34
Ranibandh		21
District: Purulia		
Manbazar I	Manbazar I	0
Manbazar II		26
Bundwan		23

Neglect of small villages

During pre-survey visits by the survey team it was learnt that, in general, villages which had small populations, could hardly convey their wishes for getting focused either in development programmes or in the assessment and evaluation studies. Many inhabitants of such little populated villages felt that the fruits of the development hardly reached their areas as their voice, needs and aspirations did not carry any weightage while framing development schemes.

The feelings of the neglect of the "little population" villages were well kept in mind while selecting requisite number of villages for the Survey. Due consideration was therefore given to include "little population" villages with pre-dominance of scheduled tribes population while selecting sample of villages. Purposive sampling technique, was, therefore applied for selection of villages as well. Statement 1.3 gives distribution of villages selected by their population size.

Statement 1.3: Number of villages selected for the survey by there population size.

Population size of village	**No of villages selected**	**Percentage representation in the sample**
Less than 500	22	30.47
500-999	30	41.75
1000 and above	20	27.78
Total sample	**72**	**100.00**

The study proposal was discussed in detail with the district authorities of the selected districts. The matters were also discussed with the Block Development Officers/ Irrigation officers/ officials in charge on minor irrigation projects for selecting C.D Blocks and there from such villages, which were being serviced through minor irrigation projects. Discussions were also held with the panchayat officials. Based on the discussions at various levels and the local knowledge gathered from general discussions with the inhabitants there, the villages as shown in statement. I.4 were selected for the conduct of the Survey.

Statement I.4: List of villages selected for the survey by state, district and block

State	District	Block	Village
Jharkhand	**Gumla**	**Gumla Sadar**	Kharka
			Naditoli
			Paharpanari
			Kharo
		Palkot	Bhorataly
			Sologa
			Bhangra
			Nathpur
		Raidih	Katkaiya
			Masgaon
			Kasher
			Kiradih
Jharkhand	**Paschim Singbhum**	**Jhinkpani**	Paharbhaga
			Gurra
			Nwagaon
			Charabasa
		Khuntpani	Katsona
			Gundai
			Jonkasasan
			Keodichalan
		Chaibasa Sadar	Domardiha
			Tolgosai
			Donkasai
			Purnia
Orissa	**Keonjhar**	**Ghatgaon**	Murgapahari
			Nalabila
			Baiganpal

			Baidyamupasi
		Harichandanpur	Dhanberi
			Haridagota
			Chakradharpur
			Kalimati
		Patna	Keapara
			Kenduapara
			Swam
			Koinda
Orissa	**Mayurbhanj**	**Bangriposi**	Bounsbudhi
			Kasaibeda
			Darkontia
			Dighi
		Kuliana	Andhari
			Katsirisi
			Dumurdiha
			Haldia
		Sanmakhunta	Khandia
			Bounsbila
			Alubeni
			Kendua
West Bengal	**Bankura**	**Khatra I**	Dharra mouli
			Shivrampur
			Kumarbahal
			Barahguttee
		Hirband	Khandarani
			Uganpathar
			Masanjhar
			Itamara
		Ranibandh	Budkhila
			Bikramdihi
			Ghagra
			Garra
West Bengal	**Purulia**	**Manbazar I**	Khiriyapara
			Ramnagar
			Jalahari
			Akhaypur
		Manbazar II	Durjaypara
			Singraidih
			Borokodom
			Pratappur
		Bundwan	Patkita
			Makopali
			Dhadka
			Kunchia

A total of 3000 households were to be selected for the study to be distributed equally among the 3 states under study. In other words 1000 households were to be covered each in the state of Jharkhand, Orissa and West Bengal. Within a state, the selection of the households was equally distributed among the selected districts and among the C. D. Blocks. Principle of equitable distribution was also followed for selection of households from among the selected villages.

1.3 Profile of the Sample Area

Physical:

Jharkhand

Gumla and Paschim Singbhum are the 2 districts selected from Jharkhand. Gumla is bordered with Chattisgarh state. Paschim Singbhum borders Orissa state. The three C.D. Blocks selected from Gumla are Gumla Sadar, Raidih and Palkot. The C.D. Blocks selected fron Paschim Singbhum are Chaibasa Sadar , Jhinkpani and Khuntpani.

Orissa

Districts of Keonjhar and Mayurbhanj were selected from Orissa. Keonjhar borders with Jharkhand state and Mayurbhanj touches the border of Jharkhand and West Bengal both. The 3 C. D. Blocks selected from Keonjhar are Patna, Ghatgaon and Harichandanpur. The 3 C.D. Blocks selected from Mayurbhanj are Bangriposi, Kuliana and Samakhunta.

West Bengal

Districts of Bankura and Purulia were selected from West Bengal. Bankura touches Purulia on its west, Purulia touches Bankura district in the east and Jharkhand state in the west. Ranibandh, Khatra I and Hirbandh are the 3 C. D. Blocks selected from Bankura district.

The C.D. Blocks of Manbazar I, Manbazar II and Bandwan were selected from District Purulia. The map shown indicates that the selection of the 6 districts for the Survey meets the requirement of the Planning Commission for covering 3 states of Jharkhand, Orissa and West Bengal and also fulfills the stipulated condition of adjacency and contiguity to a large extent.

1.4 Demographic Profile:

The survey was to be conducted in the mid of the year 2003. The population census in India was held in 2001.The expectation of the GVSS was that village wise final figures of 2001 census along with its breakup by Scheduled Tribes / Scheduled Castes population at village level would become available by the time of the selection of the sample. Unfortunately, it did not happen. Formal enquiries from the office of the Registrar General cum Census Commissioner, India, revealed that the Primary Census Abstract which disseminates such statistics was still under finalisation and that they were not aware of the time by which these statistics would become ready for general release. The GVSS, under the circumstances, was left with no alternative but to use 1991 Census frame for selection of the area samples. Therefore, based on 1991 Census, the demographic profile of the sampled units is given below in Statement 1.5

Statement 1.5: Demographic Profile (Component of Scheduled Tribes population) of the villages selected for the Survey, 1991

JHARKHAND / GUMLA

District / Block /Village	Population	Scheduled Tribes population	ST % of total population
Gumla	**1153976**	**816988**	**71%**
Gumla Sadar	**104391**	**67580**	**64%**
Kharka	1397	881	63%
Naditoli	240	238	99%
Paharpanari	827	391	47%
Kharo	2622	1475	56%
Palkot	**61712**	**37330**	**61%**
Bhorataly	586	318	54%
Sologa	513	296	57%
Bhangra	1529	1279	83%
Nathpur	3403	2101	61%
Raidih	**55600**	**36460**	**65%**
Katkaiya	940	924	98%
Masgaon	572	404	70%
Kasher	2993	1542	51%
Kiradih	689	655	95%

JHARKHAND / PASCHIM SINGBHUM

District / Block /village	Population	Scheduled Tribes population	ST % of total population
Paschim Singbhum	**1787955**	**978069**	**55%**
Jhinkpani	**53272**	**36805**	**69%**
Paharbhaga	560	413	73%
Gurra	2144	1238	57%
Nwagaon	2725	1805	66%
Charabasa	381	261	68%
Khuntpani	**57225**	**47918**	**83%**
Katsona	775	651	84%
Gundai	443	353	79%
Jonkasasan	357	337	94%
Keodichalan	1095	911	83%
Chaibasa Sadar	**57409**	**46585**	**81%**
Domardiha	496	486	97%
Tolgosai	565	484	85%
Donkasai	608	460	75%
Purnia	531	403	75%

ORISSA / KEONJHAR

District / Block /village	Population	Scheduled Tribes population	ST % of total population
Keonjhar	**1337026**	**595184**	**45%**
Patna	**81221**	**41972**	**51%**
Keapara	370	286	77%
Kenduapara	546	518	95%
Swam	736	393	53%
Koinda	778	426	54%
Harichandanpur	**99563**	**54340**	**54%**
Dhanberi	336	316	94%
Haridagota	694	687	98%
Chakradharpur	833	461	55%
Kalimati	678	395	58%
Ghatgaon	**87826**	**55122**	**63%**
pahari	697	620	88%
Nalabila	745	420	56%
Baiganpal	1098	745	67%
Baidyamupasi	1068	637	59%

ORISSA / MAYURBHANJ

District / Block /village	Population	Scheduled Tribes population	ST % of total population
Mayurbhanj	**1884580**	**1090626**	**58%**
Bangriposi	**77492**	**53018**	**68%**
Bounsbudhi	460	272	59%
Kasaibeda	266	253	95%
Darkontia	838	654	78%
Dighi	393	334	84%
Kuliana	**75477**	**49408**	**65%**
Andhari	1333	454	34%
Katsirisi	1084	816	75%
Dumurdiha	1447	989	68%
Haldia	488	408	83%
Sanmakhunta	**56689**	**38042**	**67%**
Khandia	787	730	92%
Bounsbila	2461	2347	95%
Alubeni	371	367	98%
Kendua	1356	1134	83%

WEST BENGAL / BANKURA

District / Block /village	Population	Scheduled Tribes population	ST % of total population
Bankura	**2805065**	**288003**	**11%**
Khatra I	**76149**	**18587**	**24%**
Dharra mouli	940	598	63%
Shivrampur	268	252	94%
Kumarbahal	430	273	63%
Barahguttee	449	365	81%
Hirband	**62216**	**19291**	**31%**
Khandarani	768	521	67%
Uganpathar	434	274	63%
Masanjhar	774	371	48%
Itamara	460	299	65%
Ranibandh	**93748**	**44833**	**48%**
Budkhila	1075	982	91%
Bikramdihi	875	373	42%
Ghagra	1169	485	41%
Garra	692	509	73%

WEST BENGAL / PURULIA

District / Block /village	Population	Scheduled Tribes population	ST % of total population
Purulia	**2224577**	**427766**	**20%**
Manbazar I	**117550**	**27188**	**23%**
Khiriyapara	447	268	59%
Ramnagar	739	267	36%
Jalahari	183	183	100%
Akhaypur	460	253	55%
Manbazar II	**78952**	**39649**	**50%**
Durjaypara	457	235	51%
Singraidih	543	538	99%
Borokodom	977	717	73%
Pratappur	696	570	81%
Bundwan	**73043**	**37831**	**51%**
Patkita	443	214	48%
Makopali	515	515	100%
Dhadka	1374	335	24%
Kunchia	1729	1088	62%

The demographic profile shows that out of 72 villages selected in the sample, only 8 had scheduled tribes population below 50%. And out of these 8 villages, only 2 had less than 40% while in 6 villages scheduled tribes population ranged between 40% - 50%. These 8 villages belong to Jharkhand (1) Orissa (1) and West Bengal (6).

Chapter 2 Preparatory Measures for Field Work

2.1 Preparatory Measures for Fieldwork:

The first phase of the preparation for the fieldwork started from the first week of August (w. e. f. 03/08/2003).

As a first step, the state govt. officers of Jharkhand, Orissa and West Bengal were contacted at state headquarters for intimating them about the proposed study and also for soliciting their support in the form of issuance of necessary advice instructions to the district level authorities for extending necessary help and cooperation to GVSS.
Subsequently, authorities at district level were contacted for soliciting their help regarding the selection of requisite number of C.D Blocks and villages.

The second phase started with the launch of flying visits by the team of GVSS in areas proposed for selection and study. Contacts were established with the B. D. Os and Block Panchayat officials / Rural Development Officers who not only offered their unstinted support but also were instrumental in establishing our rapport with inhabitants of the selected villages.
This initial contact with the villagers followed by the discussion on the subject gave enough idea on the lines on which the survey was to be conducted.

Based on the discussions, a set of schedules was prepared for collection of the relevant data from the respondents. The three-tier mode of enquiry was adopted for the Survey. Accordingly, three different schedules of enquiry were devised, one for the C.D. Blocks, the other for the Villages and the third for the Households selected for the Survey.

2.2 Design of Schedules

Block Schedule

As stated earlier, 3-tier scheme for devising schedules was adopted to collect information at C.D. Block level, village level and household level.
The Block Schedule aimed at the collection of data pertaining to the land use, area irrigated in 1995-96 and 2000-01 by sources of irrigation, minor irrigation works completed up to 1995-96 and during 2000-01, minor irrigation works under construction after 1995-96 along with the year in which expected to be completed and additional irrigation potential likely to be created after completion, area under water loging during 1995-96 and during 2000-01, arrangement for maintance and repair of minor irrigation works etc. Such information was to be obtained from the block office for the concerned block.

Village Schedule

The Village Schedule aimed to collect village level information of the selected villages on the expectation that the required information would be forthcoming either from the village level officials or from the concerned block office. The information was to be collected for land use area irrigated in 1995-96 and 2000-01 by source of existing minor irrigation works, new works under construction, the creation of additional irrigation potential, utilization of irrigation facilities vis a vis irrigation potential, details on the beneficiary committees and the training details of their members, drinking water facilities etc.

Household Schedule

The Household Schedule aimed at collecting information from the selected households through personal interview method. Besides questions relating to irrigation details, it contained question on the economy of the household, health, disease, source of drinking water, acquisition of consumers, durables, land, association with the maintenance of the irrigation works, views of the households on the maintenance of irrigation works. Some of the questions in the Household Schedule were incorporated to provide indices on the economic development of the scheduled tribes population covered in the sample.

2.3 Conduct of Pretest

Before the start of the Survey, it was considered necessary to put all the 3 schedules devised for the study to a pre-test. A team of 6 investigators was selected for this exercise. A two-days training programme was conducted for the 6 investigators selected for the pre-test. The trainees were acquainted with the terminology and the concepts adopted in all the 3 schedules. The training was held on August 4 and 5, 2003 at the office of the GVSS, Purba Udayrajpur, 24 Pg (North) West Bengal. The Pre-test was started on Friday, the 8th August 2003.

In the first stage of pre-test, Block Schedule and Village Schedule were canvassed in one village of one Block each covered in the sample in the states of Jharkhand, Orissa and West Bengal. The pre-test was conducted in Gumla Sadar C.D. Block of distt. Gumla in the state of Jharkhand, Patna C.D. Block of distt. Keonjhar in the state of Orissa and in Khatra C.D. Block of district Bankura in the state of West Bengal.

The exercise of Pre-test revealed that the information pertaining to the land use, sources of irrigation, the launch and completion of minor irrigation works for the concerned block was not available in the Block Office. Our

investigators, however, felt positive about the availability of the desired information of the block in the Block Office itself. They failed to get any information for the block despite repeated efforts from the Block Office of the concerned block either in Jharkhand or in West Bengal.
For Jharkhand, it was learnt that the relevant records have yet to be transferred from the parent state of Bihar. For West Bengal, the block officials did not advance any plausible reason for non-availability of the records. General apathy of the staff, perhaps, explained the reason for not parting with the required statistics. Some information however, became available in the Patna C D Block Office, Orrisa.

The experience of the Pre-test of Village Schedule too was not a happy one. As has been the case with the Block Schedule, the information required for the Village Schedule also could not be obtained from Block Office and the offices of the Panchayat administration.

In view of the Pre-test experience of the Block and Village Schedules, it became evident that the official statistics for use as a basis for starting point and also as a barometer for cross checks with the response recorded in the main survey would not be available. It also became clear that the retention and canvassing of these 2 schedules would not provide any useable information but for the returns of repeated blanks in place of meaningful entries. The G.V.S.S., therefore, decided not to canvass Block Schedule and Village Schedules.

The Household Schedule was pre-tested in 30 households selected randomly @ 10 households from one village. The pre-test covered 3 villages, @ one village from each state, representing one C.D. Block in each state. In other words, the Household Schedule was pre-tested in each state by covering 10 households, 1 village, 1 block and one district from

each state. The villages in which Household Schedule was pre-tested are given in Statement 2.1 below:

Statement 2.1: Sample units where pre-test was conducted

Name of the Village	C-D. Block	District	State	Date of survey
Kharo	Gumla Sadar	Gumla	Jharkhand	08/08/2003
Keopara	Patna	Keonjhar	Orissa	08/08/2003
Dharra Mouli	Khatra	Bankura	West Bengal	08/08/2003

The experience of the Pre-test as conveyed by the investigators was discussed on 10th August 2003. Based on the observations of the Pre-test, it was learnt that the respondents were not able to recall correct age, days of illness and the estimated value of their crops for earlier years. It was also learnt that the respondents felt reluctant to divulge information on the acquisitions. The entire lots of investigators including those selected for the main survey were given through training in canvassing the Household Schedule before the start of actual work of the main survey.

2.4 Special Caution

Field Investigators were sensitized to deal with the respondents carefully by winning their confidence. Investigators were also advised to exercise patience on the questions where elements of recall and reluctance were involved.

Since the respondent population belonged to scheduled tribes, investigators were advised to exercise extra caution in canvassing the schedules. They were also advised not to utter any thing or do anything, which might hurt their feelings.

2.5 Questions on Economic Development

Direct indices:

The measurement of the change in economic development becomes a difficult task, more so, when the survey is on a very limited scale and the level of development in the area appears abysmally low. This being the case of a study in an area with a legacy of poor agricultural development and of a population, which is primarily comprised of ***adivasis*** and scheduled tribes, the general level of the prevalent economy could, at the best, be described as equivalent to an economy sitting in the wait of the dawn of the development. The questions framed for the study of their status of economic development were devised specially, keeping in view their likely status prior to 1995-96 and the probable reflections for a better way of life, if any, after 2000-01.

The following questions aimed at studying economic development were incorporated in the Household Schedule among others.

Q. No. 7: Area of land available for cultivation

The change in area would indicate addition to the stock of land of the household.

An increase in the area would indicate rise in the economic level and the reduction in the area would indicate negative development.

Q. No. 8: Area of land sown and irrigated:

An increase in the proportion of the area irrigated to area sown would indicate a positive development towards higher yield in crops followed by higher income leading in turn to a relatively higher status.

An increase in the proportion of area irrigated through 1995-96 to 2000-01 would also give an idea of the impact of minor irrigation projects on the level of economic development.

Q. No. 9: Irrigation needs and potentials

A study of gap between irrigation needs and potentials can also give an idea about the economic development.

A reduction in this gap over the period of study would sound good for the economic development. Also, the reduction in the gap would indicate the contribution of the minor irrigation projects in reducing the gap between irrigation needs and irrigation potentials available.

Q. No. 10: Estimated Value of Crops

A jump between the estimated value of crops in 1995-96 and 2000-01 would reflect income trends of the households under study and consequently the resultant level change in the economy of the households.

If the jump comes out to be hyper, the change in economic development becomes significant. In case, this jump happens to be moderate, it could be due to the changes in price index instead of the development.

Q. No. 11: Financial Status

Financial status of a household is one of the most powerful index of the household. A loan for land, house purchase, machinery, loan for family functions etc. would be generally in tune with the income / assets or the repaying capacity of the household. If the loan comes from a Govt. agency or Bank/Coop Society, it certainly considers the back up of assets and the repaying capacity. This in turn would indicate the financial status of the family. On the other hand, excessive and frequent loans cast spell on the

dwindling financial strength of the household. A study of the loan situations over the period of the survey would be pointer towards the stability and strength of the financial status and thus the march toward higher financial strength and development.

Q. No. 12: Household Acquisitions

Household acquisitions in the form of additional land, agricultural equipments, mode of conveyance and also the acquisitions of the durable goods like fans, sewing machines, television, refrigerators, and modern gadgets like V. C. R, Computers, telephones etc. are some of the pointers towards gain in economic status.

The quantum of such acquisition over the period of study would provide clue to the changes in the levels of economic development of the households under study.

Indirect indices

Q. No. 13, 14 and 15

Impact on Main Source of Drinking Water Fuel Used for Cooking and on Toilet Facility

Level of economic development also becomes visible through the study of indirect indices like change in the source of drinking water, nearness to the availability of the drinking water, change in the type of fuel used for cooking, availability of electricity, location or toilet facility in home etc. Changes in use and availability of such facilities over time would provide a look into the changes in economic status caused by the impact of minor irrigation works provided the occupation of cultivation remains the only professional pursuit.

2.5 Q. No. 1: Household Details

Index of economic development can also be assessed through the reduction in the size of the household. A large household is indicative of under development and unchecked growth of population. From the information collected on household the size of the household can be worked out.

The above questions devised for the study of economic development in the tribals of the area under study through the execution of minor irrigation projects would help in assessing the changes overtime, which in turn, would provide necessary think material for drawing future action oriented plans of development for there areas.

Chapter 3 About Minor Irrigation

The past experience in launching and execution of normal irrigation projects comprising of dams, headwork's main irrigation canals along with complete network of distributaries with field channels showed that such projects not only call for heavy expenditure but also take long time to complete. As an alternative, it was more pragmatic to create irrigation potential in relatively shorter duration and with much smaller investment by utilizing available surface and ground water sources. This alternative source of irrigation by utilizing surface and ground water resulted in the birth of the concept of "Minor Irrigation".

3.1 The Concept of Minor Irrigation Project

The need for creating additional irrigation potential in relatively shorter duration with much smaller investment in comparison to normal irrigation project by utilizing available surface as well as ground water sources led to the birth of the concept of Minor Irrigation projects . In terms of the irrigation potential, the cultivable command area of a minor irrigation scheme is conceived to be less than 2000 hectares.

A working group on minor irrigation programme for the ninth five-year plan was constituted by the Govt. of India. Among other thrust areas, this group suggested speedy completion of the on going projects under minor irrigation programme and also for laying more emphasis for exploration of ground water schemes as compared to surface water schemes.

In short span of time the minor irrigation project has become an acceptable and economical mode for providing

Irrigation facilities with the following significant advantages:

- Needs relatively smaller investment.
- Needs much shorter gestation period in comparison to normal irrigation project.
- Does not create rehabilitation and environment conservation problems.
- Does not require big area and makes land acquisition easier for the erection of the project.
- Suits high patches of land in getting irrigated.
- Exploit ground water and prevents water logging and salination to a great extent.

Realising the importance of minor irrigation projects, the Govt. of India constituted a Working Group on Minor Irrigation Programme for the Ninth Five Year Plan with the major thrust on speedy completion of on-going projects and for laying more exploitation of ground water as compared to surface water. Efforts were also to be made to involve farmers in various aspects of management and maintenance these of irrigation projects.

The programme of minor irrigation schemes covers the schemes pertaining to, both, surface water and ground water. The surface water scheme is a twin programmed scheme and provides irrigation facility, through minor surface water flow irrigation projects and surface water lift irrigation schemes.

3.2 Surface Water Minor Irrigation Schemes

Surface water minor irrigation schemes comprise of surface flow schemes and surface lift schemes.

Surface Flow Schemes use rainwater either by storing or by diversion from streams, rivers, nalas etc. The diversion is done with the prime objective of regulating the flow of rivers and streams through erection of both,

temporary and permanent channels. While permanent channels use brick and cement, temporary diversions are usually made of earth. Temporary channels need frequent repairs and reconstructions as most of them are usually washed away during rainfalls.

The surface water flow irrigation projects comprise of storage and diversion works and provide means of irrigation in the tracts, which are chronically drought affected. Such projects provide considerable help in re-charging the resources of ground water in hard rocky areas.

Surface water lift irrigation schemes are useful on sites where available surface water cannot be used for irrigation through construction of flow irrigation works due to topographical limitations.

Surface water lift scheme are suitable in areas where gravity flow irrigation is not practicable because of uneven and hilly / rocky terrain. Such schemes are workable in areas where water in streams is available for at least 200 days in a year and cheap electric power is also available.

Surface water lift irrigation schemes are similar to diversion channels but require construction of pump houses and provision of water lifting pumps. These schemes in general are costly. However individual cultivators prefer to use this system due to its advantages of small water discharges portability of pumps and greater flexibility and mobility of installation at different points of water source.

Small storage tanks store water for facilitating surface water lift irrigation. These tanks impound water of streams, rivers, for irrigation purpose. In addition, bunds and dams also provide water impounded from rain, canals, streams etc for irrigation through surface water lift.

3.3 Ground Water Minor Irrigation Schemes

The ground water minor irrigation schemes form the major part of the minor irrigation programmes. The main components of this programme are constrictions of dug wells, and tube wells etc. These are further classified into high capacity deep tube wells, low capacity deep tube wells, medium capacity deep tube wells, shallow tube wells and open dug wells. Tube wells are created through a borehole by penetration into the ground for tapping ground water from porous layers of the underground earth layers. Usually boring is done by percussion method using hard boring sets.

A deep tube well is bored to a depth of about 100 meters or more. Shallow tube wells are generally owned by individidule and their depth varies between 60- 70 meters.

Depending upon their capacity, deep tube wells are classified as high capacity, medium capacity and low capacity deep tube wells.
Dug wells are open wells of varying dimension and are dug from the ground surface down into the water bearing level of the ground for extracting water for irrigation. They can be masonry pucca or katcha.

3.4 Minor Irrigation Projects in Sampled Area

The local level staff and the staff of C. D. Blocks were instrumental in guiding the selection of sample area for the study. From general discussion it became evident that they were well aware of the prevalence and the spread of the minor irrigation projects in these areas. During the course of our discussions, we were clearly informed that the minor irrigations works were the primary source of irrigation in the sampled areas. Minor irrigation works, thus had important role in irrigation and consequently in the economic development of the population inhabited there.

The information in detail about the network of the minor irrigation works in operation was considered necessary for having a feel of the magnitude of the irrigation facilities available for proper assessing the “met” needs of irrigation and also the “unmet” needs of irrigation in the area under study.

3.5 Attitude of Apathy

With a view to obtain information about the details of the minor irrigation works along with the areas fed by them, our teams visited the offices of the selected C. D. Blocks.

In Jharkhand, the Project Coordinator with his team personally met Secretary Planning & Development. Advisor Planning and Secretary, Water Resource’s Department, all based at Ranchi. He also met Deputy Commissioner, Gumla, and the S.D.Os Minor Irrigation of the 3 selected C.D. Blocks namely Raidih, Gumla Sadar and Palkot. He also contacted Dy. Commissioner of Paschim Singbhum and Suptd. Engineer, Chaibasa. In addition, he also met Block Development Officer of 6 C. D. Blocks.

To our utter surprise, the block offices expressed their inability to provide information on the grounds that such information was not available with them. Our teams, faced apathetic situation and felt helpless despite the fact that the Project Coordinator had established personal contacts at almost all levels, apprised them of the details about the project and solicited their advice, support and help. Though the officials at senior level showed their interest in the project, apathy was evident in their work culture at lower levels.

In Orissa, the Coordinator contacted Secretary and the Joint Secretary in the Water Resources Deptt., both based at Bhubeneswar. Meetings were also held with the Project Administrator (Integrated Tribal Development Agency) I.T.D.A Keonjhar and Mayurbhanj and also with the Executive

Engineer, minor irrigation, Keonjhar and Mayurbhanj. The GVSS Team also called on Block Development Officers of the 6 Selected Blocks, several times. In addition, the team also contacted Junior Agriculture officer of Bangriposi, Kuliana and Samakhunta C.D. Blocks.

In West Bengal, the team met District Magistrate and additional District Magistrate (Development) of District Purulia and Bankura. Besides meeting the Block Development Officers of the selected 6 Blocks.

Despite meeting the officers at various levels, the GVSS failed to obtain list of minor irrigation projects serving the irrigation needs of the area selected. For Jharkhand, we were informed that the relevant records were yet to be received from Bihar Govt. The mood and attitude of the officials in West Bengal appeared to be casual and full of apathy. In contrast, officials in Orissa, were quite cooperative and parted with the information as available with them.

In the absence of the information on the operation of the minor irrigation projects in the sampled area, GVSS made efforts to collect this information by adopting the mode of corner discussions with the tribal inhabitants of the sampled area. Based on the corner discussions in sampled areas of Jharkhand and West Bengal and the information as obtained from the officials in Orissa, some details could be compiled. These details would give an idea about the operation and the availability of irrigation services in the areas selected for the study. These are given in Statement 3.1 below:

Statement 3.1: Availability of irrigation facility from minor irrigation projects

State/ District/Block	No.of irrigation projects (reported)	No. of River lift irrigation projects(Reported)	No. of wells (all types) (reported)	No. of ponds/ Talabs (reported)
Jharkhand				
Gumla				
Gumla Sadar	5	14	3264	2
Palkot	9	6	5	2
Raidih	5	20	2375	
Paschim Singbhum				
Jhinkpani		12	110	4
Khuntpani		2	14	43
Chaibasa Sadar		2	312	67
Orissa				
Keonjhar				
Ghatgaon	9	33	1600	1
Harichandanpur	18	66	1000	18
Patana	9	58	3200	49
Mayurbhanj				
Bangriposi	6	29	491	60
Kuliana	7	26	1550	80
Sanmakhunta	4	11	225	15
West Bengal				
Bankura				
Khatra I	7	3	350	680
Hirbandh	10	8	350	670
Ranibandh	7	11	164	651
Purulia				
Manbazar I	12	10		20
Manbazar II		6	600	420
Bundwan	15	8		400

Notes:

1. Information for Jharkhand and West Bengal is based on field information as collected from the Block Office orally and from discussions with the respondents.

2. Information on Orissa is based on the statistics contained in the document 'Minor Irrigation Projects in Orissa' issued by the office of the Chief Engineer, Minor Irrigation, Orissa, Bhubaneswar and also as collected from block office/ Irrigation department.

3. Blanks against columns indicate that the field investigators could not succeed in eliciting relevant information.

   The above statement containing skeletal information gives an idea about the prevalence of general attitude in lower level local offices and about their failure to appreciate the relevance of the impact studies which are duly approved by the authorities for receiving the feedback and consequently for initiating remedial / corrective measures. The lower level staff was either unconcerned with the development issues or were scared of the out come of the "impact" study.

Chapter 4 Characteristics of the Population

4.1 Size of the household

A total of 3000 households were selected for the Survey. As the sample aimed at studying the impact of minor irrigation projects on Scheduled Tribes population only, all the 3000 selected households belonged to these tribes. These households had a total population of 15,047 of which 7732 were males and 7315 were females. This population came from 72 villages. Statement 4.1 shows the number of selected households with their population and average size of the household for each Block separately.

The average size of the household is depicted in graph 4.1 arranged in descending order of the size for studying comparable situation.

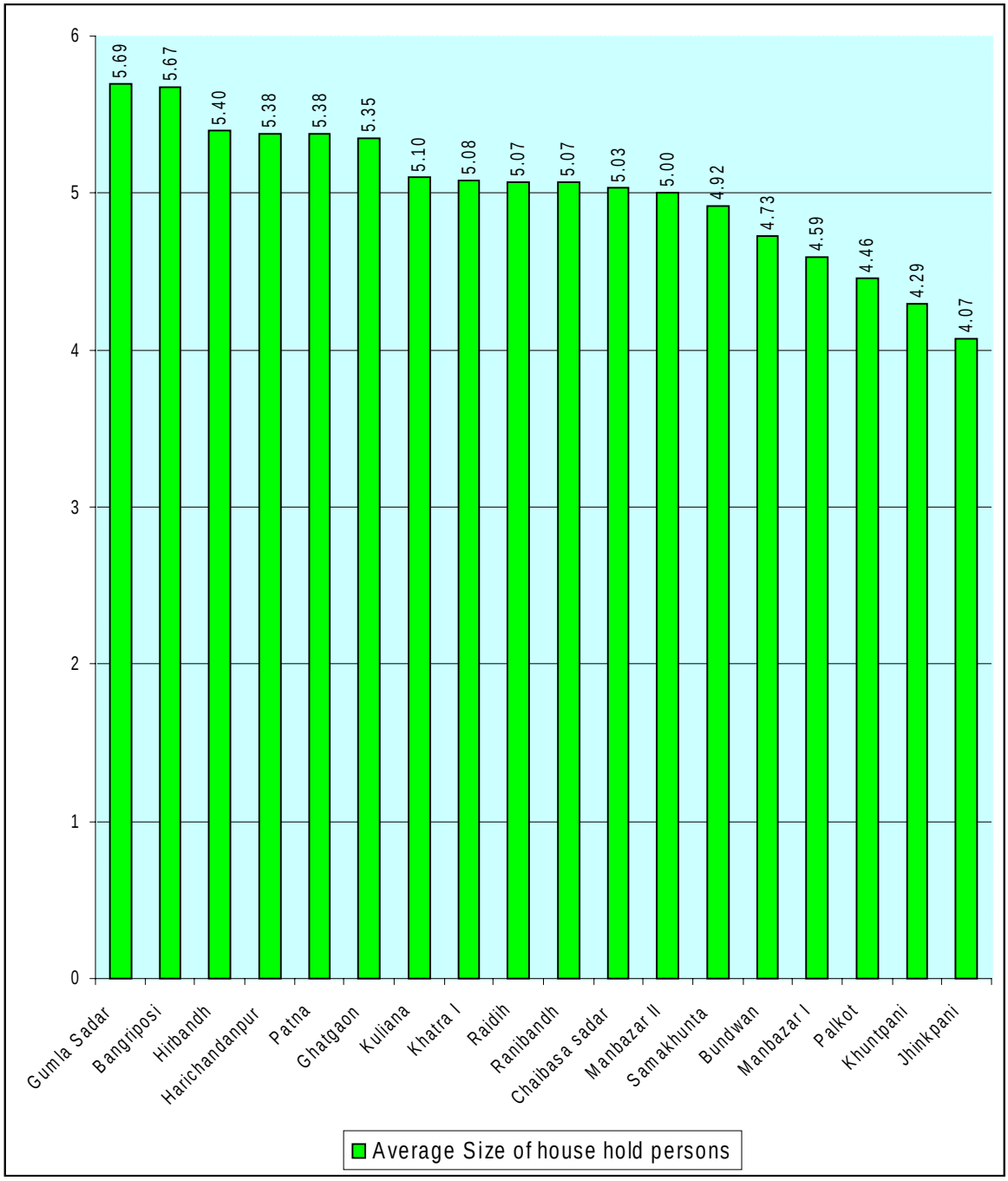
The survey revealed a marked difference in the average size of the household among the selected blocks. Of the 18 C.D. Blocks, 6 had an average size of household of less than 5 persons. These were Palkot (District Gumla), Jhinkpani and Khuntpani (District Paschim Singhbhum) in Jharkhand, Samakhunta (District Mayurbhanj) in Orissa and Manbazar I and Bundwan (District Purulia) in West Bengal.

In other blocks it was observed to be more than 5 persons per household Gumla Sadar had the highest size of 5.7 persons following by Bangriposi in Mayurbhanj This indicates that the idea of small family norm has not caught up in 12 blocks. A clear impediment among others, for economic development exists in these 12 blocks in the form of the relatively larger size of the household.

Statement 4.1: Block wise numbers of sample households, population and average size of the household.

State/District/Block	Number of Households selected	Population	Average size of household (persons)
Jharkhand			
District: Gumla	500	2536	5.07
Gumla Sadar	167	951	5.69
Palkot	166	738	4.46
Raidih	167	847	5.07
District:Paschim Singbhum	500	2231	4.46
Jhinkpani	168	684	4.07
Khuntpani	167	717	4.29
Chaibasa Sadar	165	830	5.03
Orissa			
District: Keonjhar	500	2690	5.38
Ghatgaon	167	894	5.35
Harichandanpur	165	893	5.38
Patna	168	903	5.38
District : Mayurbhanj	500	2612	5.22
Bangriposi	165	935	5.67
Kuliana	168	856	5.10
Sanmakhunta	167	821	4.92
West Bengal			
District : Bankura	500	2592	5.18
Khatra I	165	838	5.08
Hirbandh	167	902	5.40
Ranibandh	168	852	5.07
District: Purulia	500	2386	4.77
Manbazar I	165	757	4.59
Manbazar II	167	835	5.00
Bundwan	168	794	4.73

Graph 4.1: Block wise average size of the household (2000-2001)



4.2 Work participation

Gainful employment is a powerful index of development in a population. The index of employment is directly related to the index of development, higher the proportion of employed, higher would be the index of development.

The development is also directly related to the work participation rate of the females. Higher work participation of females leads to higher income on one hand and reduction in the magnitude of dependency on the other. Moreover, the increased work participation rate of females adds to the economic liberation and provides boost to women's empowerment. The work participation rates, both, of males and females of the C.D. Blocks surveyed is given below in statement 4.2:

The work participation rates worked out on the basis of the survey statistics present a contrast between males and females employment. The state and status of females employment is deplorable as in none of 18 C.D. Blocks, their work participation rate exceeded 5%. It was 0% in Samakhunta Block (district Mayurbhanj, Orissa). It was less than 1% in Harichandanpur and Patna (Districts Keonjhar) and Bangriposi and Kuliana (district Mayurbhanj) in Orissa. The highest work participation rate of 4.9% was recorded in C D Block Jhinkpani, district West Singhbhum, Jharkhand.

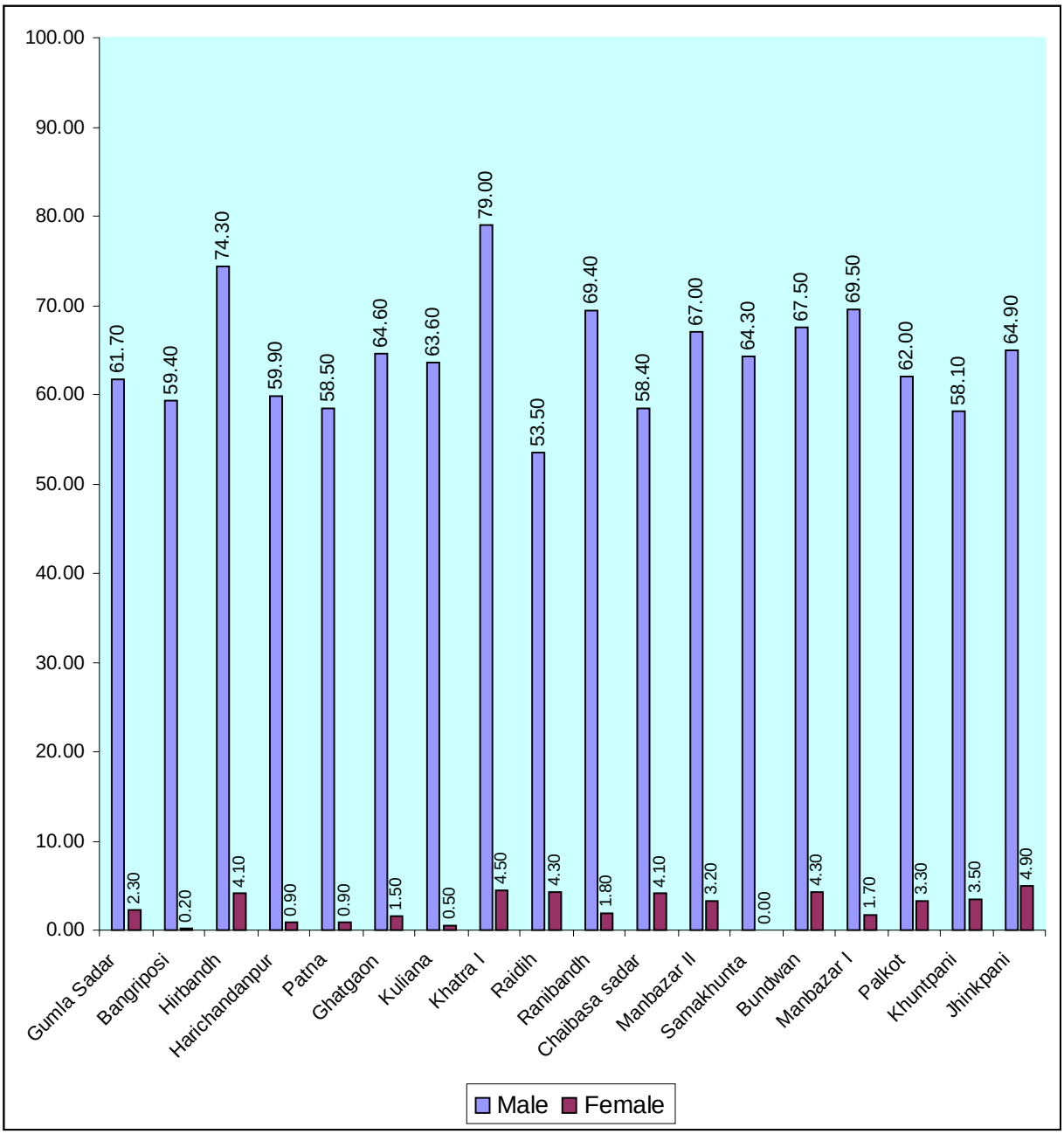
As regards work participation rates for males, 6 C D Blocks recorded less than 60%. These are Raidih in district Gumla (Jharkhand), Khuntpani and Chaibasa Sadar district Paschim Singhbhum (Jharkhand), Harichandanpur and Patna in district Keonjhar and Bangriposi in district Mayurbhanj (Orissa). The male work participation rate worked out to be above 70% in 2 C.D. Blocks only, Khatra I and Hirbandh both in district Bankura of West Bengal. Graph 4.2 provides quick visuals of the males and females work

participation rates for all the blocks for better understanding of the situations.

Statement 4.2: Work participation rate – (% engaged in cultivation, waged labour and other work)

State/District/Block	Total population and work participation			
	Males		Females	
	% Engaged	Total	% Engaged	Total
Jharkhand				
District: Gumla	59.1	100.0	4.3	100.0
Gumla Sadar	61.7	100.0	2.3	100.0
Palkot	62.0	100.0	3.3	100.0
Raidih	53.5	100.0	4.3	100.0
District:Paschim Singbhum	60.2	100.0	4.1	100.0
Jhinkpani	64.9	100.0	4.9	100.0
Khuntpani	58.1	100.0	3.5	100.0
Chaibasa Sadar	58.4	100.0	4.1	100.0
Orissa				
District: Keonjhar	61.1	100.0	1.2	100.0
Ghatgaon	64.6	100.0	1.5	100.0
Harichandanpur	59.9	100.0	0.9	100.0
Patna	58.5	100.0	0.9	100.0
District : Mayurbhanj	61.4	100.0	0.2	100.0
Bangriposi	59.4	100.0	0.2	100.0
Kuliana	63.6	100.0	0.5	100.0
Sanmakhunta	64.3	100.0	0.0	100.0
West Bengal				
District : Bankura	74.1	100.0	3.5	100.0
Khatra I	79.0	100.0	4.5	100.0
Hirbandh	74.3	100.0	4.1	100.0
Ranibandh	69.4	100.0	1.8	100.0
District: Purulia	68.0	100.0	3.0	100.0
Manbazar I	67.0	100.0	3.2	100.0
Manbazar II	69.5	100.0	1.7	100.0
Bundwan	67.5	100.0	4.3	100.0

Graph 4.2 : Work participation rate (% engaged in cultivation, waged labour and other work)



4.3 Burden of Dependency:

Burden of dependency is another index of development. The burden of depending is inversely proportionate to the level of development. A high level of economic development in normal population leads to low level of burden of dependency. The population if classified by broad age groups, would give an idea about the compositions of population by “working ages” and “dependent ages”. In general, the sum of the population below 15 years is considered young population of dependent ages.

Likewise, population above 60 years is considered old population of “dependent” ages. The population of 15-59 years of age is considered the population of working ages.

The population of “dependent” ages, both, young dependents under 15 years of age, and old dependents above 60 years of age, in general, look towards the population of “working” ages for their needs and hence become dependent on them. This is particularly so in our country as we have yet to develop a comprehensive system of social security for the dependent population. Until then, the dependent population would be a burden on the population of “working” ages and the population of working ages would continue to bear the burden of dependency.

The burden of dependency has been worked out, separately, for young dependents, old dependents and all dependents.

It is observed from Statement 4.3 that the burden of dependency is not evenly distributed. Considering all the Blocks covered in the Survey, there were 492 dependents per 1000 persons of working ages. Assuming that Block with the highest number of dependents is economically much burdened in comparison to other Blocks, the survey revealed that Gumla

had the highest burden of dependency with 631 dependents. Other Blocks in order of relatively less burden were found to be Patna and Bangriposi (Orissa), Raidih and Khuntpani (Jharkhand) and Bandhwan and Ranibandh (West Bengal). Jhinkpani Block in Jharkhand had the lowest burden (393) of dependency among all the Blocks.

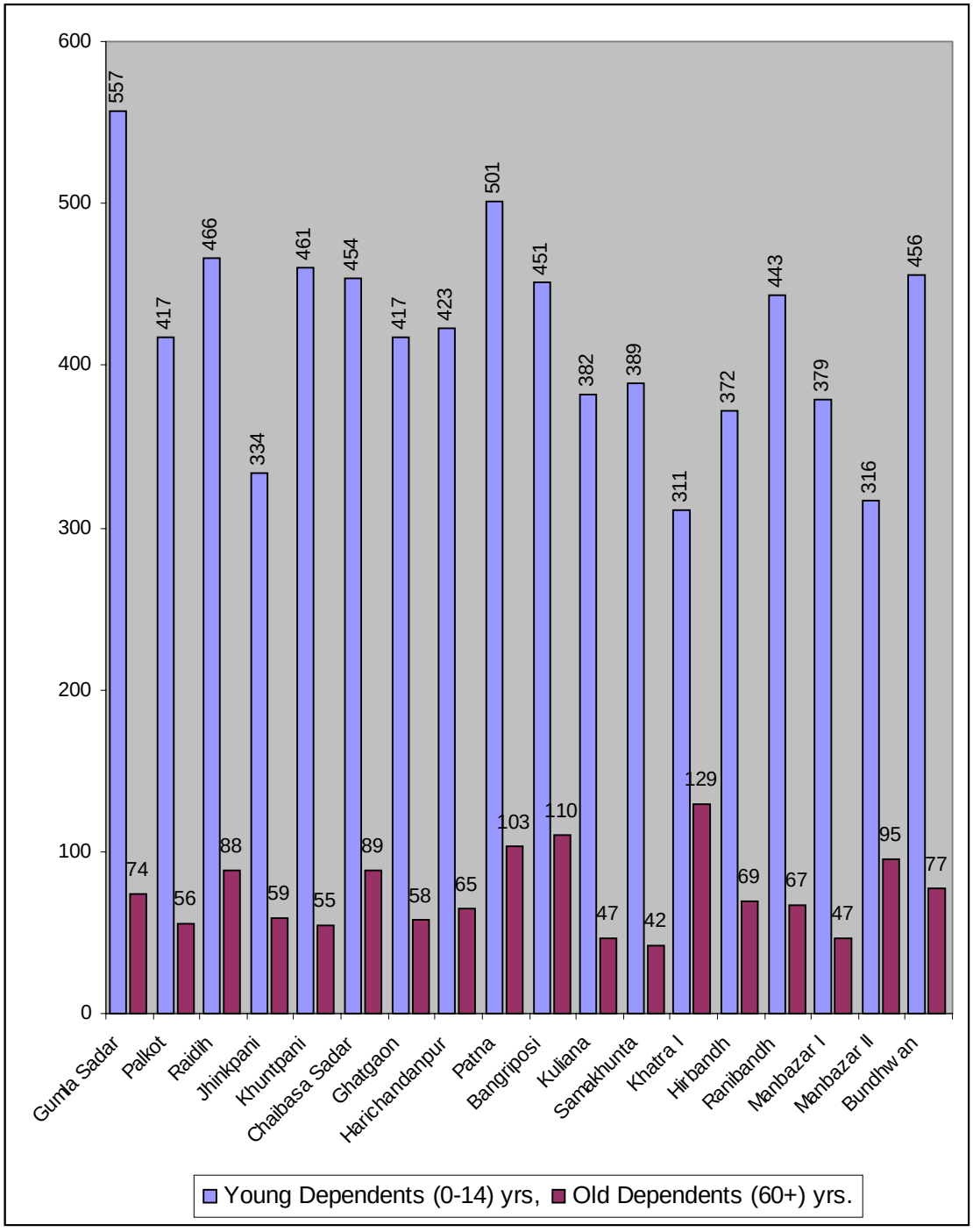
The highest burden of old dependents was found in Khatra I (West Bengal). Bangriposi in Mayurbhand (Orissa) and Patna in Keonjhar (also in Orissa) were the other 2 Blocks where ratio of old depedents was found to be relatively higher.

Young dependents were found to be highest in Gumla in Jharkhand and lowest in Khatra I in West Bengal. The ratios of total dependents, however, would provide the burden of dependency for the purpose of developmental planning in these areas.

Statement 4.3 : Burden of dependency number of dependents per 1000 persons of working ages (15-59 years)

State / District Block	Young dependents (0-14) years	Old dependents (60+) years	Total dependents	No. of persons of working ages
Gumla Sadar	557	74	631	1000
Palkot	417	56	473	1000
Raidih	466	88	554	1000
Dist: Gumla	**465**	**73**	**538**	**1000**
Jhikpani	334	59	393	1000
Khuntpani	461	55	516	1000
Chaibasa Sadar	454	89	543	1000
Dist:Paschim Singhbhum	**417**	**69**	**486**	**1000**
Ghatgaon	417	58	475	1000
Harichandanpur	423	65	488	1000
Patna	501	103	604	1000
Dist:Keonjhar	**446**	**75**	**521**	**1000**
Bangriposi	451	110	561	1000
Kuliana	382	47	429	1000
Samakhunta	389	42	431	1000
Dist:Mayurbhanj	**408**	**67**	**475**	**1000**
Khatra-I	311	129	440	1000
Hirbandh	372	69	441	1000
Ranibandh	443	67	510	1000
Dist:Bankura	**375**	**88**	**463**	**1000**
Manbazar-I	379	47	426	1000
Manbazar-II	316	95	411	1000
Bandwan	456	77	533	1000
Dist:Purulia	**380**	**74**	**454**	**1000**

Graph 4.3 : Burden of dependency: Number of dependents per 1000 persons of working ages (15-59 years)



4.4 Literacy

In an attempt to study the level of literacy, data has been tabulated both, for males and females aged less than 30 years. It was not considered worthwhile to study literacy levels among those aged above 30 years, as that would take us back beyond 30 years period a time where the campaign on literacy was in very low profile. The study of literacy levels of these below 30 years of age would reflect on the awareness, interest and the availability of the infra-structure on education about the current period and also around the recent past.

The survey count gave a total of 4292 males and 4241 females (total population 8533) below 30 years of age. Among them, the count showed only 14 graduates of whom 11 were males and 7 post graduates of which 3 were females. Those who passed higher secondary turned out to be 257 of whom 74 were females. The bulk of those aged 30 years and below had studied up to primary level. Statement 4.4 gives Blockwise details about educational levels of the population who returned their age below 30 years.

A perusal of literacy levels shows that tribal population of this area has not been adequately sensitized for going to schools. Most of the population either did not attend school or did not pursue education even upto primary level. Males of only 8 Blocks (above 5 %) did attain some education above primary level. Raidih in district Gumla (Jharkhand) is the only block where about 19% males went beyond primary level of education. In this very block, females also did not lag much behind males and about 16% of them went beyond primary level of education. The level of education in other areas remained mostly upto primary level for both, males and females.

It is unthinkable to take the population along the path of development unless the people are sensitized to the necessity of being educated, taken to schools and beyond for higher-level education.

Education is considered to be an important input in this area where concerted efforts are required to be made in the form of social investment.

Statement 4.4: Educational levels of population Aged below 30 years.

State/District/Block	% Of population below 30 years with educational levels.					
	Males			Females		
	Total	Below primary level	Above primary level	Total	Below primary level	Above primary level
Jharkhand						
District: Gumla						
Gumla Sadar	100.0	94.2	5.8	100.0	97.8	2.2
Palkot	100.0	64.8	5.2	100.0	96.3	3.7
Raidih	100.0	81.2	18.8	100.0	84.1	15.9
District:Paschim Singbhum						
Jhinkpani	100.0	93.1	6.9	100.0	96.9	3.1
Khuntpani	100.0	96.8	3.2	100.0	99.5	0.5
Chaibasa Sadar	100.0	93.1	6.9	100.0	97.7	2.3
Orissa						
District: Keonjhar						
Ghatgaon	100.0	94.8	5.2	100.0	100.0	0.0
Harichandanpur	100.0	95.0	5.0	100.0	100.0	0.0
Patna	100.0	93.2	6.8	100.0	99.3	0.7
District : Mayurbhanj						
Bangriposi	100.0	97.4	2.6	100.0	99.6	0.4
Kuliana	100.0	93.8	6.2	100.0	95.7	4.3
Sanmakhunta	100.0	96.6	3.4	100.0	98.7	1.3
West Bengal						
District : Bankura						
Khatra I	100.0	99.1	0.9	100.0	99.5	0.5
Hirbandh	100.0	98.1	1.9	100.0	99.6	1.4
Ranibandh	100.0	99.6	0.4	100.0	100.0	0.0
District: Purulia						
Manbazar I	100.0	99.6	0.4	100.0	100.0	0.0
Manbazar II	100.0	100.0	0.0	100.0	100.0	0.0
Bundwan	100.0	99.7	0.3	100.0	100.0	0.0

Chapter: 5 Development of Irrigation

5.1 Cultivation as Occupation

The survey covered a total of 3000 households almost equally spread over 6 districts, 18 C. D. Blocks and 72 villages. It returned a total of 15,047 persons, of which 7732 were males and 7315 females. The occupational distribution shows that about 34% were engaged in cultivation and 29% did not pursue any income generating activity but were engaged in household duties. Of the remaining, about 27% were found to be students. An analyses by sex showed that there were vast differences in pursuit of income generating activities. Statement 5.1 shows occupational distribution, separately for males and females in the areas surveyed.

Statement 5.1: Occupational distribution of surveyed Population by sex

Occupation	**% Engaged**		
	Total	**Males**	**Females**
Cultivation	32.9	62.1	2.1
Wage labourer	1.0	1.6	0.4
Other work	0.4	0.6	0.2
Household duties	29.3	0.9	59.2
Students	28.4	27.6	29.3
Dependents / retired and pensioners	8.0	7.2	8.8
All occupations	**100.0**	**100.0**	**100.0**

It is evident that those who are engaged in household duties, students, dependents, retireds and pensioners are not occupied with any income generating activity. Thus, by the very nature of their activities, such persons are none else but non-workers. The survey revealed that more than one

third of males (35.7%) and most of the females (97.3%) were non–workers. The survey also revealed agriculture was the only occupation, which has become their way of life. This occupation seems to be the only source of their existence.

5.2 Areas irrigated:

In a community where agriculture becomes the only source of income, the role of irrigation cannot be minimized. It becomes necessary to realize that for the survival of such community agriculture has to survive and for the survival of agriculture, adequate irrigation facilities have to be provided.

In the context of the area in which the Survey was conducted, an attempt has been to study the availability of the irrigation facilities if any, through the changes observed in the area irrigated over the two periods, one prior to 1995- 96 and the other during 1995-96 through 2000-2001. The extent of increase in the area under irrigation would provide clue to the impact of irrigation. Statement 5.2 shows the extent of changes in the volume of irrigation in these areas created through minor irrigation projects to the cultivators in these areas.

Statement 5.2: Area Sown and Area Irrigated

State/ District/ CD Block	1995-96		Index of area sown in 2002-01 (base 1995- 96 =100.0)	1995-96 and 2000-2001		2000- 2001
	Area Sown	Area Irrigated		Area Sown	Area Irrigated	% change in area irrigated over the period
District: Gumla			**Jharkhand**			
Gumla Sadar	100.0	43.1	100.0	100.0	43.1	0.0
Palkot	100.0	36.4	100.0	100.0	36.4	0.0
Raidih	100.0	47.0	100.0	100.0	47.0	0.0
District:Paschim Singbhum						
Jhinkpani	100.0	45.5	100.0	100.0	45.7	0.2
Khuntpani	100.0	38.8	100.0	100.0	38.8	0.0
Chaibasa Sadar	100.0	42.0	100.0	100.0	42.0	0.0
District: Keonjhar			**Orissa**			
Ghatgaon	100.0	43.1	100.0	100.0	43.1	0.0
Harichandanpur	100.0	42.2	100.0	100.0	42.2	0.0
Patna	100.0	40.6	100.0	100.0	40.6	0.0
District : Mayurbhanj						
Bangriposi	100.0	43.4	100.0	100.0	43.4	0.0
Kuliana	100.0	53.4	100.0	100.0	53.4	0.0
Sanmakhunta	100.0	54.7	100.0	100.0	54.7	0.0
District : Bankura			**West Bengal**			
Khatra I	100.0	49.2	116.4	100.0	42.2	- 7.0
Hirbandh	100.0	56.6	101.8	100.0	55.7	- 0.9
Ranibandh	100.0	48.5	100.0	100.0	48.5	0.0
District: Purulia						
Manbazar I	100.0	63.5	99.5	100.0	63.5	0.0
Manbazar II	100.0	60.7	100.0	100.0	60.7	0.0
Bundwan	100.0	53.2	100.0	100.0	53.2	0.0

The above statement shows that irrigation facilities not only remained poor but also failed to enhance over the period of 5 years (1995-96 to 2000-2001) under study. It is also observed that out of 18 blocks studied, only 6 blocks could irrigate more than 50% of the area. Out of these, 4 are located in West Bengal and 2 in Orissa. The blocks which could irrigate more than 50 % of the area sown are Kuliana and Samakhunta in district Mayurbhanj. (Orissa), Hirbandh in district Bankura (West Bengal), Manbazar I, Manbazar II and Bandhwan (also in West Bengal).

All the 6 blocks in districts Gumla and Paschim Singbhum (Jharkhand), all the 3 blocks in district Keonjhar (Orissa), one block in district Mayurbhanj (Orissa) and two blocks in district Bankura (West Bengal) remained poorly served in the matter of irrigation. The poorly irrigated blocks with irrigated area below 50% are listed below in statement 5.3 in order of the attention they deserve in further extension of irrigation facilities. For the sake of convenience it is assured that areas with less than 50% irrigation are gating are turned as poorly irrigated areas.

Statement 5.3: Poorly irrigated blocks in ascending order of their needs and priority of attention.

Name of the C D Block	District	State	Area irrigated as % of area sown
Palkot	Gumla	Jharkhand	36.4
Khuntpani	Paschim Singbhum	Jharkhand	38.8
Patna	Keonjhar	Orissa	40.6
Sadar Chaibasa	Paschim Singbhum	Jharkhand	42.0
Harichandanpur	Keonjhar	Orissa	42.2
Khatra I	Bankura	West Bengal	42.2
Gumla Sadar	Gumla	Jharkhand	43.1
Ghatgaon	Keonjhar	Orissa	43.1
Bangriposi	Mayurbhanj	Orissa	43.4
Jhinkpani	Paschim Singbhum	Jharkhand	45.7
Raidih	Gumla	Jharkhand	47.0
Ranibandh	Bankura	West Bengal	48.5

The analysis also reveals that the Block Jhinkapni in district Paschim Singbhum has shown slight increase in the percentage of area irrigated. This increase in misleading as it is not because of the increased irrigation facility but because of the slight increase in the area irrigated as per respondents' version during the Survey enquiries.

Similarly the decrease in the percentage of area irrigated in 2 Blocks (Khatra I and Hirbandh) in West Bengal is not due to any withdrawal or curtailment in irrigation facility. This decrease is attributed to the fact that the respondents increased the area-sown whereas absolute area irrigated remained the same.

Of the two periods of our study, the starting period of 1995-96 has been treated as a base period and the area sown and irrigated would depict the position as existed then. The area sown and the irrigated after a period of 5 years, i.e. in 2000-01 would clearly reflect the augmentations in the level of irrigation facilities, which, in turn, would reflect the magnitude of change in the area shown and the area irrigated.

If there has been an increase in area sown and area irrigated, it can safely be attributed to the increased irrigation capacity. On the other hand, if there is no change in the quantum of area sown and area irrigated, it can safely be inferred that there had not been any change in the availability of irrigation facilities. Statement 5.2 shows the extent of area irrigated from the area sown in both the periods i.e. at the base period or 1995-96 and at the end period of 2000-01.

A perusal of the index of area sown in 2000-01 over 1995-96 shows that the area sown has remained same over the period of 5 years in all the blocks except in Khatra I and Hirbandh (both in district Bankura) in West Bengal where there has been slight increase. The area sown has gone down a

little in Manbazar I in Purulia district of West Bengal. Thus, there has not been any noticeable change in the area sown over the last 5 years which could be termed worth record. This situation could have arisen because of the following situations.

1. All the land available for sowing could have been sown already in 1995-96. Hence, area sown remained same in 2000-2001.

2. The cultivators did not see any increase in the irrigation facilities in 2000-2001. So, it was not considered worthwhile to add more area to the area already being sown, even though they had more land for cultivation in their possession.

3. The cultivators did not have enough financial resources to bring more area under sowing either on lease or on purchase/ownership basis. In other words, their economic status did not record any change in 2000-2001 over 1995-96.

Most of the cultivators concurred with the situation explained in 2 above.

The survey findings indicate that the irrigation facilities as available in 1995-96 did not meet the total requirement of irrigation. The network of irrigation fulfilled some needs of irrigation in the context of area sown and also left some needs in irrigation 'unmet'. As observed earlier, there had not been any addition in the area irrigated in 2000-2001 over the area irrigated in 1995-96, the quantum of unmet needs also remained almost same. The 'met' needs and the 'unmet' needs in irrigation remained same, both, in 1995-96 and after 5 years, in 2000-2001.

5.3 Unmet needs in irrigation

Various 5-year development plans have been aiming at the development of agriculture throughout the country for more than 5 decades. About 70% of workers have been engaged either in cultivation or as agricultural labourer. Irrigation is considered as one of the most important inputs for transformation of low yield status into high yield status of the cultivated land. Also development of irrigation works reduces the dependency on rains, which are not only seasonal but also erratic and unpredictable.

Not very long ago, gap between area sown and area irrigated was quite wide. Though this gap has been abridged to a great extent in many states areas inhabited by the tribals have not reaped the benefits on even basis.
The gap in the need for irrigation still remains. It is this gap, which still persists in the areas surveyed. Statement 5.4 give an idea about the unmet needs in irrigation, which were existing prior to 1995-96 and also were found to be existing during the conduct of the Survey as on 2000-01.

Statements 5.4: "Met" and "Unmet" irrigation needs, 1995-96 and 2000-2001

State/ District/ CD Block	Total irrigation needs		% Met needs		% Unmet needs	
	1995-96	2001	1995-96	2000-01	1995-96	2000-01
District: Gumla	**Jharkhand**					
Gumla Sadar	100.0	100.0	43.1	43.1	56.9	56.9
Palkot	100.0	100.0	36.4	36.4	63.6	63.6
Raidih	100.0	100.0	47.0	47.0	53.0	53.0
District:Paschim Singbhum						
Jhinkpani	100.0	100.0	45.5	45.7	54.5	54.3
Khuntpani	100.0	100.0	38.8	38.8	61.2	61.2
Chaibasa Sadar	100.0	100.0	42.0	42.0	58.0	58.0
District: Keonjhar	**Orissa**					
Ghatgaon	100.0	100.0	43.1	43.1	56.9	56.9
Harichandanpur	100.0	100.0	42.2	42.2	57.8	57.8
Patna	100.0	100.0	40.6	40.6	59.4	59.4
District : Mayurbhanj						
Bangriposi	100.0	100.0	43.4	43.4	56.6	56.6
Kuliana	100.0	100.0	53.4	53.4	46.6	46.6
Sanmakhunta	100.0	100.0	54.7	54.7	45.3	45.3
District : Bankura	**West Bengal**					
Khatra I	100.0	100.0	49.2	42.2	51.8	57.8
Hirbandh	100.0	100.0	56.6	55.7	43.4	44.3
Ranibandh	100.0	100.0	48.5	48.5	51.5	51.5
District: Purulia						
Manbazar I	100.0	100.0	63.5	63.5	36.5	36.5
Manbazar II	100.0	100.0	60.7	60.7	39.3	39.3
Bundwan	100.0	100.0	53.2	53.2	46.8	46.8

Chapter 6 Modes of irrigation

6.1 The study team collected information on the mode(s) of irrigation as available to the cultivators for irrigation of their land. The various modes adopted for eliciting response of the household were from both the sources of irrigation, by (i) Ground water sources and (ii) by Surface water sources. The surface water sources were further classified by lift irrigation and flow irrigation.

Ground water sources included sources like open wells, dug wells, shallow wells, deep dug wells, tube wells, etc. In short all sorts of wells were taken as the mode of ground water source for irrigation.

Surface water sources included modes like tanks, reservoirs, rivers, canals, diversion, channels, and check dams, bundyings, watersheds etc.
From among these sources, where water was stored and lifted for irrigation through use of motor pumps were taken as sources of lift irrigation. And where flowing water from streams, canals, or other water channels whether flowing perennially or by of rain whether stored or un stored gravitation, and was used for irrigation without any use of motor pump of rains were taken as the modes of flow irrigation.

6.2 The data collected from the sampled households in the selected 72 villages revealed that there were in all 1404 sources through which they irrigated their land. Of these 1154 accounted for ground water sources and 250 for surface water sources. It should be kept in mind that the sources revealed by the respondent households did not amount to 1404 projects because one project was the source of more than one household and thus was returned as a source of irrigation by more than one household. It can, however, be said that 82% of

Statement 6.1: Area irrigated by source of irrigation

	% Area irrigated by source			
State / District Block	**All sources**	**Ground water (All Well)**	**Surface water**	
			Flow irrigation source	**Lift irrigation**
JHARKHAND				
Gumla Sadar	100.00	17.23	66.70	16.07
Palkot	100.00			100.00
Raidih	100.00	31.11	08.89	60.00
Dist: Gumla (Pooled)	100.00	**22.00**	**35.24**	**42.76**
Jhikpani	100.00			
Khuntpani	100.00	58.33		41.67
Chaibasa Sadar	100.00	07.21	31.53	61.26
Dist:Paschim Singhbhum (Pooled)	100.00	**12.19**	**28.46**	**59.35**
ORISSA	100.00	52.31	32.31	15.38
Ghatgaon				
Harichandanpur	100.00	10.00	06.00	84.00
Patna	100.00	64.02		35.98
Dist:Keonjhar (Pooled)	100.00	**35.72**	**12.40**	**51.88**
Bangriposi	100.00	10.76	43.08	46.16
Kuliana	100.00	03.52	36.04	60.44
Samakhunta	100.00		29.63	71.37
Dist:Mayurbhanj (Pooled)	100.00	**02.80**	**34.11**	**63.09**
WEST BENGAL				
Khatra-I	100.00		55.59	44.41
Hirbandh	100.00	04.44	12.78	82.78
Ranibandh	100.00		25.06	74.94
Dist:Bankura (Pooled)	100.00	**01.23**	**32.58**	**66.19**
Manbazar-I	100.00	07.35	31.51	61.14
Manbazar-II	100.00	19.46	35.62	44.92
Bandwan	100.00	05.33	54.70	39.97
Dist:Purulia (Pooled)	100.00	**15.07**	**37.69**	**47.24**

sources of irrigation comprised of the ground water and the remaining 18% comprised of surface water sources.

It is surprising that although ground water sources for irrigation was returned as 82% but it was responsible for irrigation only 13% of the total irrigated area. Moreover, contribution of ground water source and surface water source was not evenly distributed in terms of % area irrigated in the sampled area. This would be evident from the details given in statement 6.1

A perusal of statement 6.1 shows that the modes of irrigation operated in different intensity in different areas of survey. None of the 3 sources of irrigation were found to be fully dominant in any particular district or for that matter in all selected villages of any particular development block. Details by the pre -dominance of the source of irrigation are given in statements 6.2, 6.3 and 6.4.

Statement 6.2: Area irrigated by ground water source (all wells) in descending order

State	District	Development block	% area irrigated by all wells
Orissa	Keonjhar	Harichandanpur	64.02
Jharkhand	West Singbhum	Khuntpani	58.33
Orissa	Keonjhar	Ghatgaon	52.31
Jharkhand	Gumla	Raidih	31.11
West Bengal	Purulia	Manbazar II	19.46
Jharkhand	Gumla	Gumla	17.23
Orissa	Mayurbhanj	Bangriposi	10.76
Orissa	Keonjhar	Patna	10.00
West Bengal	Purulia	Manbazar I	0735
Jharkhand	West Singbhum	Sadar chaibasa	07.2
West Bengal	Purul;ia	Bandhwan	05.33
West Bengal	Bankura	Hirbandh	04.44
Orissa	Mayurbhanj	Kuliana	03.52

Ground water schemes by their very nature are considered more dependable source of irrigation for the reason that they do not possess the characteristics of uncertainty and unpredictability. Besides they can be easily sustained and maintained, as they are by and large individual owned. Their maintenance, therefore do not involve procedural wrangles of the Govt. departments.

During the survey it was discovered that ground water irrigation was pre-dominant only in only 3 blocks of Harichandanpur and one block each of Ghatgaon (Orissa) and Khuntpani (Jharkhand).

Ground water source of irrigation was found virtually non-existent in the villages surveyed falling under 5 development blocks. These blocks were Palkot and Jhinkpani (Jharkhand), Samarkhunta (Orissa) and Khatra I and Ranibandh (West Bengal).

6.3 It is on record that the central Govt. launched a “Million Wells Scheme” during 1988- 89 with a view to expand and create ground water irrigation potentials and also to provide sustained self employment for wriggling out the marginal and poor cultivators of poverty.

Though about 3.7 million wells were in use in the state of composite Bihar, Orissa and West Bengal by 1995, the survey could discover only 794 wells in the area under study. Their details are given hereunder.

State	Area surveyed in	No of open wells and dug wells discovered
Jharkhand	Gumla	382
	West Singbhum	77
Orissa	Keonjhar	171
	Mayurbhanj	63
West Bengal	Bankura	54
	Purulia	47
	Total	**794**

It will be seen that out of 3.7 million wells constructed, the survey areas predominantly inhabited by scheduled tribes and scheduled castes could get on an average only one well out of every 4660 wells constructed. In Jharkhand one well came to the survey area out of every 624 wells constructed. In Orissa one well came to the survey area out of a mass of 1204 wells constructed and in West Bengal one well came out of every lot block of 5337 wells constructed under the umbrella of Million Wells Scheme.

Statement 6.3:Area irrigated by surface water sources flow irrigation

State	District	Development block	% area irrigated by flow irrigation scheme
Jharkhand	Gumla	Gumla	66.70
West Bengal	Bankura	Khatra I	55.59
West Bengal	Purulia	Bandhwan	54.70
Orissa	Mayurbhanj	Bangriposi	43.08
Orissa	Mayurbhanj	Kuliana	36.04
West Bengal	Purulia	Manbazar II	35.62
Orissa	Keonjhar	Ghatgaon	32.31
Jharkhand	West Singbhum	Sadar Chaibasa	31.53
West Bengal	Purulia	Manbazar I	31.51
Orissa	Mayurbhanj	Samankhunta	29.63
West Bengal	Bankura	Ranibandh	25.06
West Bengal	Bankura	Hirbandh	12.78
Jharkhand	Gumla	Raidih	08.89
Orissa	Keonjhar	Patna	06.00

6.4 Flow irrigation is the predominant source of irrigation in the survey areas falling under the 3 development blocks namely Gumla (Jharkhand) and Khatra I and Bandhwan (West Bengal). Flow irrigation is non-existant in the survey area falling under the development blocks of Palkot, Jhinkpani and Khuntpani (Jharkhand) and Harichandanpur (Orissa). It is obvious that the schemes for storage and diversion of rainwater water through streams, nalas or rivers have not been developed in these areas.

6.5 As regards storage schemes for facilitating flow irrigation, the survey discovered the existence of 176 tanks, 18 diversion channels and 22 check

dams and water sheds. The details of tanks, diversion channels including watersheds and check dams are given below.

State	District	Number of		
		Tanks and reservoirs	**Diversion channels and watersheds**	**Chek dams and bundings**
Jharkhand	Gumla	60	3	
	West Singbhum	16	2	
Orissa	Keojhar	03	2	2
	Mayurbhanj	14	2	3
West Bengal	Bankura	58		9
	Purulia	25	9	8
Total		**176**	**18**	**22**

The paltry number of storage tanks, diversion channels and dams and bundyings in use shows that the schemes for impounding rain water and its diversion are quite inadequate and results not only in wastage of rain water but also in loss of irrigation potentials which could have been created with proper bundyings. Besides, this type of water wastage also results in soil erosion. Water recharging potentials also suffer enormous loss.

6.6 The cultivators in these areas have some faith in traditional bundyings and erecting small drains which are earthen and kucha and require reconstruction after every spell of rains. Imparting orientation programmes on bundyings, recharging, rainwater impounding techniques and strategies etc periodically are strongly recommended.

The benefits of flow irrigation can be optimized if wastage of water is eliminated. However, this feature has not been observed in the survey areas. Most of the available water gets wasted due to lack of proper water

conveyance channels. Drains, nalas, budyings etc. are earthen made and they suffer from frequent breaches. Water conservation based techniques of conveyance like masonry drains, masonry watersheds have been found to be absent in these areas. The stage is not yet ripe for the introduction of modern and innovative techniques like sprinklers, underground channels. However, some cultivators have started using P.V.C pipes for water conveyance but their poor financial status does not permit to use them extensively. P.V.C pipe proves costly whether by ownership or by hiring it. There is thus an urgent need for launching durable and economical water conveyance channels so that the flow water could be impounded properly and utilized. The farmers also need to be educated about the economy and benefits of drip irrigation.

6.7 The status of the area irrigated by surface water sources- lift irrigation is reflected in statement 6.4 below.

Statement 6.4: Area irrigated by surface water sources lift irrigation.

State	District	Development block	% area irrigated by lift irrigation schemes
Jharkhand	Gumla	Palkot	100.00
Orissa	Keonjhar	Patna	84.00
West Bengal	Bankura	Hirbandh	82.78
West Bengal	Bankura	Ranibandh	74.94
Orissa	Mayurbhanj	Samnakhunta	71.37
Jharkhand	West singbhum	Sadar chaibasa	61.26
West Bengal	Purulia	Manbazar I	61.14
Orissa	Mayurbhanj	Kuliana	60.44
Jharkhand	Gumla	Raidih	60.00

Orissa	Mayurbhanj	Bangriposi	46.16
West Bengal	Purulia	Manbazar II	44.92
West Bengal	Bankura	Khatra I	44.41
Jharkhand	West singbhum	Khuntpani	41.67
West Bengal	Purulia	Bandhwan	39.97
Orissa	Keonjhar	Harichandpur	35.98
Jharkhand	Gumla	Gumla	16.07
Orissa	Keonjhar	Ghatgaon	15.38
Jharkhand	West singbhum	Jhinkpani	0.00

It will be seen that lift irrigation is prime source of irrigation in the survey area of 9 development blocks. These are Palkot, Sadar Chaibasa, and Raidih (Jharkhand) Patna, Samankhunta, and Kuliana (Orissa) and Hirbandh, Ranibandh, and Manbazar I (West Bengal). It must be clearly understood that lift irrigation becomes the source of irrigation only in those areas where terrain and topography make it difficult to adopt flow irrigation direct from rivers and streams.

6.8 This type of situations calls for lifting the water from the rivers canals, streams and pre–supposes the availability of water to these sources for sufficient period during the year. It also pre-supposes the use of water pumps for lifting. This further pre-supposes the availability of either cheap electricity and or diesel fuel. The purchase or hiring of pumps, their maintenance and the procurement of diesel or kerosene of electricity becomes costly proposals for cultivators of these areas for the simple reason that the survey population with appalling poverty is comprised of small and marginal cultivators who owned petty holdings of around 2 acres size and belonged to scheduled castes and scheduled tribes.

They continue to live in vicious circle of poverty and deserve relief and freedom from the life of marginalisation and poverty. This is specially needed for those whose % age of irrigated area by lift irrigation falls below 50%. These areas lie in the charge of Khuntpani and Gumla blocks of Jharkhand, Bangriposi, Harichandanpur, and Ghatgaon of Orissa and Manbazar II Khatra I and Bandhwan of West Bengal.

Chapter 7 Dysfunctional Projects

7.1 The economic development was hampered not only with the obstacles like inadequate source of irrigation, unmet needs in irrigation but also by dysfunctionality of the existing irrigation sources.

7.2 Attempt was also made to know the extent of dysfunctionality of Minor Irrigation projects in the survey areas. Information was, therefore, collected about those minor irrigation works which though were created and existed on sites at the time of survey but were either not in use or were non-functional due to one reason or the other. These included those minor irrigation projects, which were rendered dysfunctional by the time of the survey and were awaiting repairs.

Dysfunctional minor irrigation projects were discovered in all sources of irrigation, be it ground water driven source or surface water driven source.

7.3 Dysfactionality in ground water sources:

Tube wells

Tube wells are important source of ground water irrigation. The survey team discovered 360 tubewells in total, which included both, shallow tube wells and deep tube wells. Out of these, only 250 were found to be functional. In other words, about 30% were found to be dysfunctional. The distribution along with the extent of dysfunctionality as found in the areas under survey is given below for the districts covered under the survey in statement 7.1

Statement 7.1: Number of tube wells with % dysfunctional

State/ District	Total number of tube wells located	Functionality of tube wells		
		Total	% Functional	% Dys functional
Jharkhand				
Gumla	42	100.00	40.4	59.6
West Singbhum	62	100.00	37.0	63.0
Orissa				
Keonjhar	54	100.00	66.0	34.0
Mayurbhanj	66	100.00	79.1	20.9
West Bengal				
Bankura	47	100.00	91.6	08.4
Purulia	89	100.00	86.9	13.1

7.4 The reasons for dysfunctionality and out of use were assigned as getting dried, lack of mechanical/ electrical maintenance, awaiting repairs, abandoned, destroyed.etc.

7.5 On further probing it was learnt that most of the tube wells were owned by the govt. and that their timely and proper repairs were not expected by the cultivators. All the deep tube wells were owned by the Govt. whereas shallow tube wells were owned by cultivators in Bankura and Purulia (West Bengal). Some individuals owned shallow tube wells in district Mayurbhanj (Orissa) also.

The rate of dysfunctionality shows that urgent action is required to be taken to attend dysfunctional tube wells in West Singbhum and Gumla (Jharkhand) and in Keonjhar (Orissa) where dysfunctionality rate ranged between 34% to 63%. Jharkhand authorities have to take special note of this item of work for immediate attention.

7.6 Ground wells and Dug wells

Another source of ground water irrigation comprised of ground wells and dug wells. Both ground wells and dug wells tell their own dismal bale of functionality. The highest numbers of dysfunctional projects were found among wells (both ground and dug) as would be evident from the dysfunctionality rates given in Statement 7.2 below

Statement 7.2: Dysfunctionality rate ground wells and dug wells.

Survey are in State/ District	Total number of ground wells + dug wells located	Ground wells and dug wells		
		Total	% Functional	% Dys functional
Jharkhand				
Gumla	382	100.00	23.3	76.7
West Singbhum	77	100.00	38.7	61.3
Orissa				
Keonjhar	171	100.00	30.3	69.7
Mayurbhanj	63	100.00	50.5	49.5
West Bengal				
Bankura	54	100.00	26.1	73.9
Purulia	47	100.00	20.4	79.6

7.7 Functionality rate shows that the state of ground wells and dug wells is deplorable in survey areas of five districts except Mayurbhanj in Orissa. If Mayurbhanj is ignored, it was found that the maintenance of the wells has been poor altogether. The advantage, which was to emerge under the Million Wells Scheme, has been allowed to slip away. As it is, the survey areas and the areas around the survey area need special efforts for reviving the functionality of the dysfunctional wells. The areas, which require to be attended in order of priority, lie in Purulia and Bankura (West Bengal) Gumla (Jharkhand), Keonjhar (orissa) and West Singbhum (Jharkhand).

7.8 Surface flow projects

The study revealed that surface flow is an important source of irrigation in the survey areas, specially in the areas falling under Gumla (Jharkhand) Bankura and Purulia (West Bengal) and Mayurbhanj (Orissa). This system is responsible for irrigating about 43% to 67% of the cultivated areas covered in the survey.

7.9 Survey flow system presented healthy situation in the survey area. It was found that out of total 40 units of surface flow 34 were found to be functional. This brings the functionality rate of these schemes to about 85%. Maintenance of surface flow projects was thus found to be quite satisfactory in the survey areas. However in West Singbhum (Jharkhand) the dysfunctionality was found to be highest (21.4%).

7.10 Surface lift irrigation

The survey revealed that surface lift irrigation system is important in West Bengal and Orissa. It has very little role in irrigation so far as survey areas in Jharkhand were concerned. A total of 34 projects were discovered in survey areas out of which only 3 were located in Jharkhand. The remaining

projects were almost found to be distributed equally in Orissa and West Bengal. As regards functionality status it was found that around 95% schemes were functional in West Bengal and around 80% was functional in Orissa and Jharkhand.

11. In conclusion, it can be said that there appears a need for charting a special programme for urgent repair and maintenance of wells. Repairs for reviving functionality of dysfunctional works connected with flow and lift irrigation need to be attended to, but the need for revival of dead wells has to be given priority.

Chapter: 8 On Irrigation The Respondents Speak

8.1 Absence of Information

Despite serious efforts, the survey teams failed to secure response from the lowel level officials about the details on the minor irrigation projects operational in the area, derelicted / defunct or abandoned projects and also projects which were in the pipe line for sanction or which were sanctioned.

A meeting of the survey teams was convened in the midst of the survey to work out a strategy for obtaining some information from the revenue / irrigation officials. It was also considered necessary to involve local community leaders once again for obtaining information not only on minor irrigation projects, which were operational but also on those, which were defunct or abandoned.

8.2 Strategy of Revisits

The survey teams were advised to revisit the local level officials and re-contact local community leaders. The revisits were to be done by groups and not by the individual filed investigator, as was done earlier during first round visits. The area of the investigators was swapped. An investigator who visited an area / office earlier would not visit that place.

The field investigators were advised to become official – friendly and attempt to emphasize upon the significance of the study, and if necessary, should conduct friendly tea-summits and get together. They were also provided small token gifts such as candles, key rings, coloured chalks etc. for children and grown up respondents. The strategy paid dividends and

the teams succeeded in eliciting some more information relating to the minor irrigation projects.

8.3 Type of information collected

The Project Co-coordinator kept a regular track of the information being collected. A review of the information collected showed that no information was being collected on the minor irrigation projects which were abandoned /derilicted or which required maintenance for becoming operational. The field investigators were therefore, advised to make special efforts to collect information on the operational projects, projects in the pipelines for approval and sanction, projects abandoned / derelicted or declared defunct and also on projects which became non-operational for want of repairs and maintenance. It was indeed a tall order for an area where even basic information meant for public use on the existence of the minor irrigation projects was not forth coming. Nevertheless, the field investigators succeeded in getting some valuable information on these aspects. The information so collected is given in statement 8.1 below.

Statement 8.1: Operational status of minor irrigation projects

District/ CD Block	Number of Minor Irrigation projects					
	1995-96			2000-01		
	Total	Operational	Non operational	Total	Operational	Non operational
	Jharkhand					
District: Gumla						
Gumla Sadar	NA	NA	NA	25	12	13
Palkot	NA	NA	NA	9	4	5
Raidih	NA	NA	NA	26	1115	
District:Paschim Singbhum						
Jhinkpani	NA	NA	NA	**Most of the schemes reportedly lying defunct**		
Khuntpani	NA	NA	NA			
Chaibasa Sadar	NA	NA	NA			
	Orissa					
District: Keonjhar						
Ghatgaon	NA	NA	NA	NA	NA	NA
Harichandanpur	NA	NA	NA	NA	NA	NA
Patna	NA	NA	NA	6	6	
District : Mayurbhanj						
Bangriposi	9	5	4	13	7	6
Kuliana	5		5	5	3	2
Sanmakhunta	7	5	2	13	4	9
	West Bengal					
District : Bankura						
Khatra I	NA	NA	NA	NA	NA	NA
Hirbandh	NA	NA	NA	3	NA	NA
Ranibandh	NA	NA	NA	NA	NA	NA
District: Purulia						
Manbazar I	NA	NA	NA	NA	NA	NA
Manbazar II	NA	NA	NA	NA	NA	NA
Bundwan	1	1		1	1	

Note: NA dependable information could not become available

From the information contained in Statement 8.1, it becomes clear that the irrigation facilities through minor irrigation projects have made no progress in Orissa. Nothing can be said for other 2 states of Jharkhand and West Bengal.

As regards operational aspect of the minor irrigation projects, 33 projects out of 60 in Jharkhand and 17 out 31 projects were reported to be non-operational in 2000-01. In other words, 55% of the minor irrigation projects in both, Jharkhand and Orissa were reported to be non-operational in 2000 – 2001. The non-operation was due to the reason of partly dereliction and complete dereliction.

Some information was also collected on lift irrigation through rivers and other sources such as wells and ponds, local dams, hilly channels, etc.
Hilly channels were very few and were reported in Raidih C. D. Block of Gumla in Jharkhand. A total of 15 hilly channels were providing good source of flow irrigation to the cultivators in Gumla.

Whereas hilly channels provided irrigation in Gumla district of Jharkhand, local dams were reported to be another source of irrigation in Bankura district of West Bengal. In Raniband C.D. Block 20 local dams and in Khatra I CD Block 10 local dams provided important source of irrigation to the cultivators there.

The information collected on lift irrigation through rivers and wells / ponds/tanks etc. is given in Statement 8.2 below.

Statements 8.2: Number of units of lift irrigation 2000-01

State/ District/ CD Block	Number of reported units of lift irrigation by source					
	Rivers, Canals		All Wells		Tanks/ ponds Talab etc.	
	Total	Defunct	Total	Defunct	Total	Defunct
District: Gumla	**Jharkhand**					
Gumla Sadar	14	13	3264	NA	22	
Palkot	7	6	NA	NA	4	4
Raidih	26	15	2375	NA		
District:Paschim Singbhum						
Jhinkpani	12	NA	110	NA	2	NA
Khuntpani	9	NA	NA	NA	57	NA
Chaibasa Sadar	NA	NA	312	NA	69	NA
District: Keonjhar	**Orissa**					
Ghatgaon	24	21	NA	NA	NA	NA
Harichandanpur	53	45	665	17	NA	NA
Patna	52	28	581	60	NA	NA
District : Mayurbhanj						
Bangriposi	32	NA	NA	NA	NA	NA
Kuliana	16	NA	13	NA	NA	NA
Sanmakhunta	6	2	NA	NA	NA	NA
District : Bankura	**West Bengal**					
Khatra I	3	NA	225	NA	470	NA
Hirbandh	8	NA	350	NA	670	NA
Ranibandh	11	NA	651	NA	535	NA
District: Purulia						
Manbazar I	10	NA	NA	NA	20	NA
Manbazar II	6	NA	600	NA	420	NA
Bundwan	8	NA	NA	NA	400	NA

Note: NA: Dependable information not available

It has been noticed that on the basis of available information, about 72% lift irrigation projects dependent on rivers and canals were lying defunct in Gumla district of Jharkhand. The per centage of defunct projects in this category was over 73% in Keonjhar district of Orissa. On further inquiries, it was learnt that the broad reasons for their lying defunct could be attributed to non-supply of power, damaged head works, operational problems. However, some projects were reported to have improved on transfer from revenue depart to the department of minor irrigation in Orissa.

8.4 The Tragic Fact

One tragic fact, which clearly emerged from the incomplete information contained in statements 8.1 and 8.2, is that the proportion of non-operational and defunct projects turned out to be too high to be tolerated ignored. Permitting the continuence of non-operationality for long would not only amount to the criminal waste of public funds spent on their creation but also would tentamount to playing joke on the future of the poor and innocent tribals of this part of our country.

8.5 Public Participation in Management

Encouragement of Participatory Irrigation Management is one of the important components of the National Policy for Ground Water Development framed by the union Govt. The policy states that efforts should be made to involve farmers in various aspects of management of irrigation system. This policy has been evolved to ensure workability of the ground water based irrigation development projects, as these are the major contributors in the over all development of the minor irrigation programmes. These projects are to be implemented through the construction of various types of wells for irrigation such as dugwells, dug-cum-bore wells, shallow tube wells, deep tubewells etc. These being the individuals' and

cooperatives based programmes, it becomes necessary that these are implemented, managed and maintained through individuals and cooperatives efforts. The individuals who become the beneficiaries under these irrigation schemes are encouraged to become members of Beneficiary Committees which operate for management and maintenance of their respective schemes on the principles of cooperatives and are duly registered.

8.6 Beneficiary Committees and management

Under the scheme of Beneficiary Committees, all such committees are to be imparted training on various aspects of the management and maintenance. The members are apprised of the maintenance cost estimates in advance as the beneficiaries are required to contribute a prescribed percentage of the estimates. The estimates are proposed and approved by the departments under whose change these schemes fall.

The percentage contribution is quite moderate. This system ensures transparency in maintenance through public participation and if executed properly, would result in the continuous operation of the ground water based minor irrigation works for the uninterrupted benefits of the cultivators.

8.7 Response to Beneficiary Committees

An attempt was made to obtain response on the membership of the Beneficiary Committees from the respondents through the survey. The response based information as could be collected is given in statement 8.3 below.

Statement 8.3: Constitution of beneficiary committees and views on funds contribution for maintenance

State/ District/ CD Block	No of Committees	No of Committees Trained	No of members in Committees	% Member willing to contribute
District: Gumla	**Jharkhand**			
Gumla Sadar	26	Nil	208	0.0
Palkot		Nil		
Raidih	20	Nil	160	0.0
District:Paschim Singbhum				
Jhinkpani	Nil	Nil	Nil	NA
Khuntpani	22	Nil	176	0.0
Chaibasa Sadar	18	Nil	144	0.0
District: Keonjhar	**Orissa**			
Ghatgaon	12	Nil	96	10.0
Harichandanpur	9	Nil	56	0.0
Patna	8	Nil	60	0.0
District : Mayurbhanj				
Bangriposi	Nil	Nil	Nil	Nil
Kuliana	Nil	Nil	Nil	Nil
Sanmakhunta	Nil	Nil	Nil	Nil
District : Bankura	**West Bengal**			
Khatra I	8	Nil	70	0.0
Hirbandh	9	Nil	90	0.0
Ranibandh	8	Nil	64	0.0
District: Purulia				
Manbazar I	20	Nil	160	0.0
Manbazar II	6	Nil	48	0.0
Bundwan	5	Nil	120	0.0

The details in statement 8.3 above show that the policy of Beneficiary committees and the idea of the prescribed % contribution towards the cost of maintenance of ground water based minor irrigation works has not made any headway. Some committees were constituted in Jharkhand and West Bengal. These are yet to take shape in Orissa. Training programme has not been conducted. And above all, people are not willing to contribute for maintenance and repairs. There has been failure on the part of the Government and also on the part of the participatory public. The govt. failed to evince enough interest from the public and the public failed to appreciate the benefits expected to accrue out of their participation.

Non-participation of the public perhaps, explains the reason for heavy percentage of minor irrigation projects becoming non-operative.

8.8 Respondents' Expectations and Govt.'s attitude.

Besides above details, information was also collected about the need for more irrigation facilities, on government's concern about their additional irrigational needs and also about Govt.'s monitoring on the working of the ground water based minor irrigation works.

8.9 The respondents expressed their expectation through their need for additional irrigation while the Govt.'s attitude was reflected through respondents observation on Govt.'s concern for the requirement of the additional irrigation needs and also for monitoring the working of the minor irrigation works which are based on ground water sources. Statement 8.4 reveals the views expressed by the respondents of the households on these 3 aspects.

Statement 8.4: Views of respondents on their additional irrigation needs, Monitoring of works and Govt's attitude on

District/ CD Block		% Household who Feel		
	Total House Holds	**Requirement for additional irrigation**	**Govt. is unaware Of requirement**	**Govt. monitors working**
District: Gumla	**Jharkhand**			
Gumla Sadar	165	93	44	52
Palkot	166	81	66	38
Raidih	169	88	22	86
District:Paschim Singbhum				
Jhinkpani	168	100	73	28
Khuntpani	167	99	100	23
Chaibasa Sadar	165	98	97	3
	Orissa			
District: Keonjhar				
Ghatgaon	166	99	50	96
Harichandanpur	162	98	76	86
Patna	142	85	58	71
District : Mayurbhanj				
Bangriposi	165	96	94	92
Kuliana	168	96	69	99
Sanmakhunta	167	84	69	100
	West Bengal			
District : Bankura				
Khatra I	165	100	82	33
Hirbandh	167	87	79	23
Ranibandh	168	98	85	30
District: Purulia				
Manbazar I	165	70	70	99
Manbazar II	167	77	90	99
Bundwan	168	77	94	68

8.10 It is evident from the above Statement that most of the households need additional irrigation facilities. In Purulia district of West Bengal 23-30% household did not express any need for additional needs for irrigation facilities. In contrast to this, households in 10 C.D. Blocks who required additional irrigation facilities ranged between 90-100% - a very high percentage indeed. This itself is a potent reason for extending irrigation facilities at least in these areas inhabited pre-dominantly by tribal population.

It is also evident from the above statement that the majority of the households feel that the Govt. was not very much concerned with their additional irrigation needs. In 4 C.D. Blocks (Khuntpani, Chaibasa Sadar, Bangriposi and Bandhwan) more than 90% of the households expressed that the Govt. was not concerned with their needs for additional irrigation facilities. Households in Raidih C.D.Block of Jharkhand seem to be satisfied with the Govt.'s attitude towards their additional irrigation needs.

8.11 Regarding monitoring of the working of the irrigation works, divergent views were expressed by the respondent households. While the households seem to be satisfied with the monitoring of the irrigation works by the Govt. in all the 6 C.D. Blocks of Orissa and 3 C.D. Blocks of district Purulia of West Bengal, the households in the remaining 9 C.D. Blocks expressed their dissatisfaction about the monitoring by the Govt. This indicates that in half of the areas studied, Govt. officials assigned with the task of monitoring need to do a lot more for ensuring proper monitoring.

Chapter 9 Impact on Economic Development

9.1 Review of area Sown

A perusal of statement 9.1 below clearly shows that no change has occurred in the quantum of area sown in 2000-01 in comparison to that in 1995-96. The average area sown per household which was reported around 2.0 acres in 1995-96 stood stagnant in 2000-01 also.

This is a clear indication that the population in these areas did not experience any change in their financial status and hence were not in a position to acquire any land so as to bring it under cultivation. Therefore, the size of their land holdings also remained same during the last 5 years.

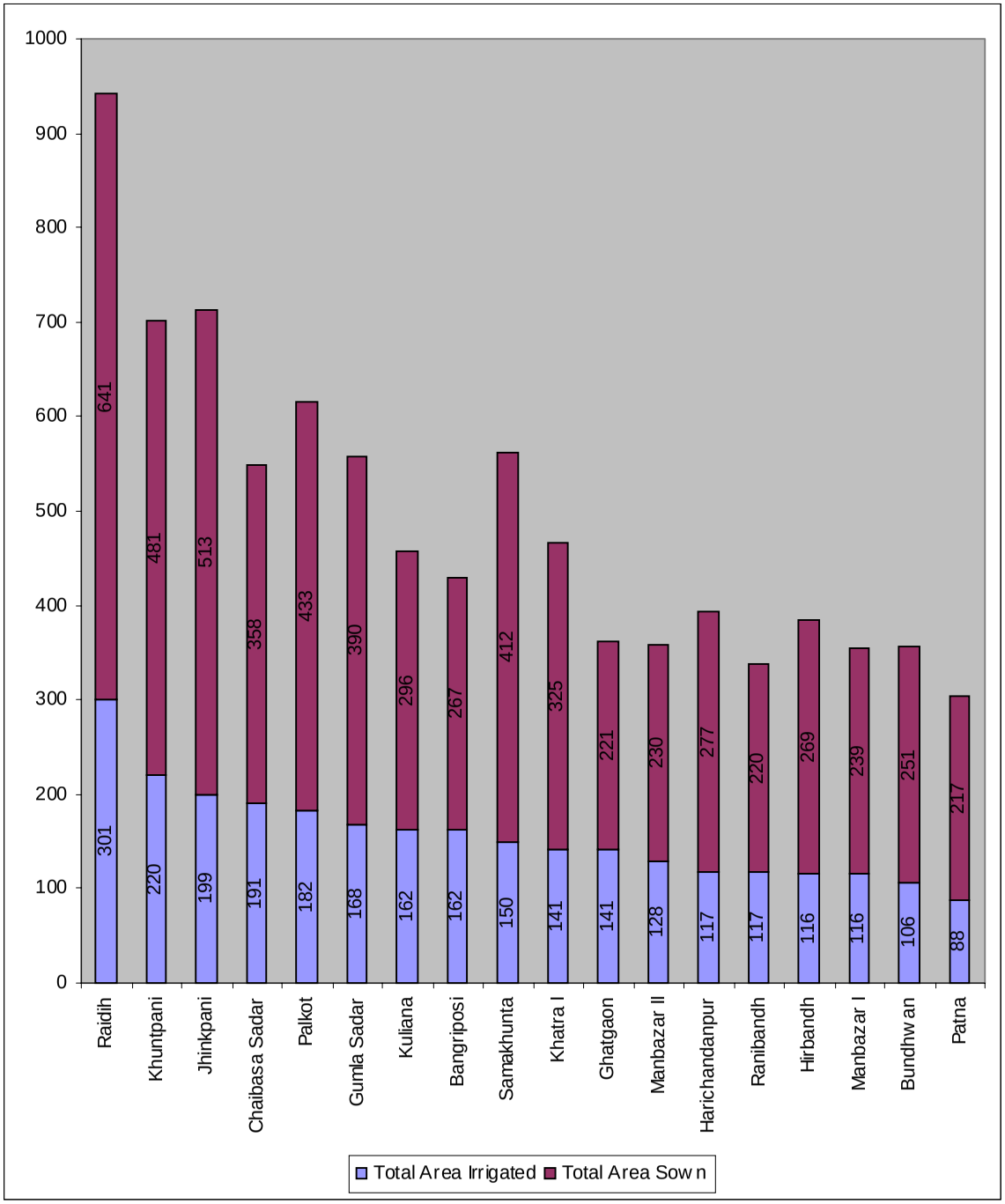
9.2 Irrigation as an Agent of Change

Water is life, for a community which is primarily engaged in cultivation. Such people meet the requirement of water through irrigation. Needs of irrigation, if met fully, lead to higher agriculture production by giving a boost to yield per acre. The increased agricultural production, in turn, take the cultivators to higher rungs of economic development and thereby, spread out the orbit of economic development, both, of the area and of the population. This development takes place horizontally and vertically. Irrigation as an input in the conduct of farming operation, thus, becomes an important agent of change for taking the farming communities through various stages of economic development.

Statements 9.1: Area sown and area irrigated (Acres), 1995-96 and 2000-01

State/ District/ CD Block	Total No. Of House hold Surveyed	Total area sown		Total area irrigated	
		1995-96	2000-01	1995-96	2000-01
	Jharkhand				
District: Gumla					
Gumla Sadar	165	390	390	168	168
Palkot	166	412	412	150	150
Raidih	169	641	641	301	301
District:Paschim Singbhum					
Jhinkpani	168	418	481	219	220
Khuntpani	167	513	513	199	199
Chaibasa Sadar	165	433	433	182	182
	Orissa				
District: Keonjhar					
Ghatgaon	167	269	269	116	116
Harichandanpur	165	251	251	106	106
Patna	168	217	217	88	88
District : Mayurbhanj					
Bangriposi	165	325	325	141	141
Kuliana	168	358	358	191	191
Sanmakhunta	167	296	296	162	162
	West Bengal				
District : Bankura					
Khatra I	165	238	277	117	117
Hirbandh	167	226	230	128	128
Ranibandh	168	239	239	116	116
District: Purulia					
Manbazar I	165	222	221	141	141
Manbazar II	167	267	267	162	162
Bundwan	168	220	220	117	117
All Blocks	3000	5998	6040	2804	2805
Average area sown per household		2.00	2.01		
Area Irrigated % of area sown				46.8	46.4

Graph 9.1 : Area sown and area irrigated (Acres) 2000-01



9.3 Status of area irrigated

The statistics of area irrigated in 1995-96 and in 2000-01 repeat the story of area sown in 1995-96 and 2000-01. No change worth notice has occurred in the size of area irrigated in any of the 18 blocks selected for the survey. A little over 46% of the area sown was reported to be irrigated both in 1995-96 and 2000-01.

The survey statistics has established clearly that there has not been any progress in the facilities of irrigation in this part of the country during the last 5 years reckoned from 1995-96. This indeed is a poor reflection on the working of those who are concerned with the issues of economic development and more so directed towards the upliftment of the tribals.

The impact of minor irrigation projects on economic development of the tribals over the period of last 5 years was hardly visible.

9.4 Direction of Economic Development

The process of economic development is not static. It is dynamic and comes through movements in two directions horizontal and vertical. In cultivation, the economic development in horizontal direction generally comes through the expansion of fixed and permanent assets like land for cultivation. The expansion of land can come through the purchase of agricultural plots. It can also come through acquisition of plots on lease/rent or batai system, depending upon the equibilibrium between the taker and giver.

Economic development in vertical direction in cultivation generally comes through the acquisition of movable and durable goods like machinery and equipments for use in cultivation such as tractor, thresher, trollies water pumps etc; modes of conveyance and transportation such jeep, truck, car motor cycle, animal driven carts etc; consumer durables like

watches/clocks, radios/transistors, fans, room coolers, refrigerators, television, VCRs/VCPs/VCDs, telephones etc.

Availability of and access to basic amenities like safe drinking water, eco-friendly fuel for cooking, provisions of toilets inside residential complexes, access to basic education, etc. also take the population dug in with subsistence level of living to the first phase of development. However, journey of the population living at subsistence level to the first phase of economic development depends to a large extent, on the measures taken by the Govt. as most of them come through govt. initiatives and are instrumental in promoting economic development in vertical direction. It may be noted that there is no set order of precedence for horizontal vertical direction of development. They follow one after the other or even might come more or less at the same time together.

9.5 Stages of Economic Development

The economic development of the area can also be assessed by studying the shifts in population from one stage of development to the other.
It is well known that the economic development takes place in stages. For the sake of assessing the status of economic development among the tribals of the surveyed areas, it is assumed that the process of economic development in these areas is set to take place in the following 5 stages.

Stage 0:

They do not have any access to media or medical facilities. They are similes and live in their own world of traditional beliefs. In this stage, households live at subsistence level. They use firewood as fuel for cooking; drink water from rivers, canals, ponds etc. They use open fields for toilet outside their homes.

Stage I:

The households reach stage I by experiencing upward mobility from the state of subsistence level by gaining access to basic amenities such as safe drinking water, education, electricity, toilet within the residential complex, eco-friendly cooking fuel etc.

Stage II:

The households reach this stage after having access amenities and acquire moderately priced consumer durables like watches/clocks, electric fans, radios/Transistors, audio players etc.

Stage III:

The households reach stage III after acquiring some of the basic amenities listed in stage I or after acquiring some of the gadgets mentioned in stage II. In addition to these the households acquire some mode of conveyance / transport for their movement and / or for the movement of their agriculture produce.

Stage IV:

The households are said to have reached this stage when their financial position attain credibility with dependable repayment and or spending capacity. In this stage, they acquire well-priced agriculture machinery and equipments and also go for four wheeled conveyance acquisitions, besides acquiring modern electronic and other consumer durables.

The acquisition of Tractor, thresher, trolleys, truck, water pumps television, refrigerator, VCR/VCP/VCD, land line/mobile phone, washing machine, etc become trend in living.

It is not necessary that for reaching stage IV, the households have to pass through the earlier 3 stages. It is certainly possible to experience a straight flight from any earlier stage to stage IV of economic development by virtue of windfalls, huge inheritances, money from unexpected sources etc.

9.6 Acquisitions as Indices of Economic Development

For assessing the direction of economic development, data was collected on certain types of acquisitions made by the tribal households covered in the Survey. The relevant information was collected separately for two periods of study i.e. as in 1995-96 and as on 2000-01. To assess the impact of minor irrigation projects on the economic development of these areas.

9.7 Assessment of Economic Development

An attempt has been made to assess the level of economic development by adopting the criteria of access to basic amenities of the households and the acquisitions as relevant to various stages of development as outlined above in section 9.4 during the two specific periods of study. The households have been divided in various stages of development keeping in view their acquisitions/ownership of broad items. Statement 9.2 given below contains this information.

The facts as contained in statement 9.2 reveal that economic development in these area has yet to make its mark. The acquisitions during the last 5 years account for some additions in clocks/watches, radios/transistors, cycles and some animal driven carts. Besides 4 motor cycles/scooters have also been added. These additions is very small number can in no way be attributed to the impact of minor irrigation projects for the reason, that no

additional area has been brought under irrigation and no additions to irrigation facilities has been reported.

No change in the direction of development appears to have taken place from one stage of development to the other.

Statement 9.2: Number of household by access to amenities And item of acquisition

Index of economic development		Total no. of household	No. of households with access / acquisition ownership in		% of household	
Access to			**1995-96**	**2000-01**	**1995-96**	**2000-01**
1	Ground water for drinking	3000	3000	3000	100.0	100.0
2	Cooking fuel other than firewood	3000	16	11	0.5	0.4
3	Toilet facility inside reside complex	3000	10	12	0.3	0.4
Acquisition						
1	Clock/ watch	3000	823	1544	27.4	51.5
2	Radio/ Transistor	3000	82	918	2.7	30.1
3	Fan	3000		7	0.0	0.2
4	Sewing machine	3000	1	5	0.0	0.2
5	Cycle		1724	2496	57.5	83.2
Acquisition						
1	Television	3000			0.0	0.0
2	Refrigerator	3000			0.0	0.0
3	Vcr/vcp/vcd	3000			0.0	0.0
4	Telephone mobile phone	3000			0.0	0.0
5	Animal cart ownership	3000	32	119	1.1	4.0
Ownership						
1	Jeep/ car	3000			0.0	0.0
2	Motor cycle scooter	3000	1	5	0.0	0.2
3	Tracter	3000	2	2	0.1	0.1
4	Thresher	3000	3	49	0.1	1.6
5	Trolley	3000			0.0	0.0
	Water pump	3000	1	12	0.0	0.4

Chapter 10 Findings and Recommendations

10.1 The launch of the project

Conducting survey for assessing the impact of minor irrigation projects on the economic development has been a rich and rewarding experience. Traveling in the tribal areas through Pucca and Kucha roads, sub-roads and feeder pathways gave an insight into the problems faced by the inhabitants during the hours of their acute needs and emergent situations. The transportation services were found to be very much limited, irregular and at times quite costly. For urbanities, journeying through some of these areas could be termed bumpy and perhaps bone cracking.

The officials at higher levels were quite helpful and willinglly extended assistance needed for the fieldwork. They discussed the project thoroughly and rendered valuable advice about the topography and the inhabitants. Besides, they rendered necessary guidelines for identifying the districts and the C.D. Blocks where Scheduled Tribes population was dominate in numbers. This help came from D.M. of Bankura, The Development Officers of there areas also helped in identifying the requisite number of villages, which were inhabited pre-dominantly by the scheduled tribes.

The local community leaders in conjunction with some staff of the C.D. Blocks introduced the teams of field investigators to the local population making the field work somewhat less difficult which otherwise could have proved quite a harrowing experience. Nevertheless the journey through the forests and the hills of Hirbandh and Bundhwan Blocks in West Bengal, for Ghatgaon, Harichandanpur Blocks in Orissa and Raidih Block in Jharkhand proved to be more than compensatory.

As it happens with every field survey, here also, the field workers faced some problems. Some of the problems created obstacles in the earnest conduct of the fieldwork. Nevertheless they braved them all and accomplished the task without any grouse. The study brought some vital findings to the surface.

The findings of the study along with the recommendations wherever deemed necessary and the problems observed are detailed hereafter.

10.2 The findings

Demographic

1. The average size of the household was found to be 5.01 person. According to 1991 census, the size of household in rural areas of Bihar (1991 Jharkhand not available), Orissa and West Bengal was 6.16, 5.31 and 5.54 respectively. This shows that tribal population in this part of our country is quite aware of adopting small family norm.

2. There were 946 females per 1000 males. According to 1991 census, there were 921, 988 and 940 females in rural areas of Bihar, Orissa and West Bengal. It was 939 for all India rural. Biologically 100 girls are born for every 105 boys. This results in 952 females for every 1000 males.
   The figure of 946 females observed during the survey is quite near to expected normal sex ratio of 952. It can be safely assumed that these areas do not possess any evidence of female foeticides.

3. Literacy among males and females came out to 9.5 and 4.8 respectively. This comes lower to even 1/4th of the rural literacy rates among the 3 states

of Bihar, Orissa and West Bengal. The population here suffers from neglect of educations programmes.

4. Among males, 64.3% were reported to be workers. Against this, only 2.7% women were found to be working.
   It is a deplorable situation for women in this area. Probing revealed that there was not enough work available for them. One wonders what happened to the rural employment schemes, and the tribal development programmes in this part of the country.

5. There were 472 dependents (both aged less than 15 years and above 59 years) for every 1000 person comprising of working ages (persons aged between 15-59 years).

   There indeed is a heavy burden of dependency on a population. of working ages primarily engaged in cultivation with an average size of the sown land holding per household around 2 acres.
   The natural growth rate of the sampled population worked out to be 2.6% per annum during 1993-98 and 0.9% per annum during 1998-2003.
   The fall in the growth rate of this population indicates preference for small families.

10.3 Agriculture

1. The average size of the land holdings of the sown area per household works out to be around 2 acres both in 1995-96 and in 2000-01. The average size of the land holding of the sown area was found lowest (1.29 acres) in Patna Block of district Keonjhar of Orissa and highest (3.79 acres) in Raidih Block of district Gumla of Jharkhand.

2. Only 46.8% of the area sown was found to be irrigated. Palkot Block of district Gumla of Jharkhand could irrigate only 36.4% of the area sown. The highest percentage of the area irrigated was found in Block Manbazar I of Purulia in West Bengal.

   Statement 10.1 lists the blocks where percentage of irrigation was found to be lower than the averages of 46.8%:

Statement 10.1: Blocks where percentage of irrigated are was Found lower than the average of 46.8

C D Block	District	State	% Irrigated area
Palkot	Gumla	Jharkhand	36.4
Khuntpani	West Singbhum	Jharkhand	38.8
Patna	Keonjhar	Orissa	40.6
Chaibasa Sadar	West Singbhum	Jharkhand	42.0
Harichandanpur	Keonjhar	Orissa	42.2
Gumla sadar	Gumla	Jharkhand	43.1
Bangriposi	Mayurbhanj	Orissa	43.4
Jhinkpani	West Singbhum	Jharkhand	45.5

   The blocks in Jharkhand were found to be less fortunate in the matter of Irrigation facilities.

3. Only 34.3% of the population was engaged in work. About 96% of the total workers were engaged in cultivation. Only 3% were found to be engaged as labourers. Workers engaged in non-agriculture work were only one percent. In other words, agriculture was the only occupation for their livelihood.

4. From among the total workers, 96% were reported male workers. Only 4% of the total workers were females. Such a small proportion of female workers in scheduled tribes and that too in rural area was an unexpected observation and was found to be contrary to general notions.

5. The engagement of only one percent of workers in non-agricultural pursuits is a very strong pointer to the fact that the avenues of work other than agriculture were non-existent.

6. Among the population up to 30 years, only 30% passed senior secondary examination. Only 23 persons out of 855 had passed graduations/pos graduations or passed technical certificate or degree. Surprising 8 out of these 12 were females. Education among the population of this area seems to be causality.

10.4 Basic amenities

The survey revealed that the population here still lived in an ancient era. Basic amenities which are considered essential in life did not reach them. Firewood was being used as cooking fuel instead of some eco-friendly one. Electric power had reached most of the places around but very few had secured access to it. They are still used to open latrines and only 12 households constructed their toilets inside residential complexes. In 1995-96 this number was 10. The source of drinking water of all the households was well/hand pump or tube well. This was the source in 1995-96 and this remained the source in 2000-01.

10.5 Acquisitions

Economically, the households did not feel the touch of development. There was no increase in size of their land holding. There was no increase in percentage of area irrigated. There was no reduction in the unmet needs

of irrigation. They, however, could acquire certain moderately prioed gadgets due to the gains they made by selling their produce at increased prices which came as a gift during the normal movement of agricultural prices upwardly. The acquisition made by the households during 1995-96 to 2000-01 are given below in Statement 10.2.

Statement 10.2 : Acquisitions made by the households during 1995-96 to 2000-01.

Item of acquisition	**No. of households acquiring by 1995-96**	**2000-01**	**No. of Households still to acquire**
Clock/watch	823	1544	1456
Radio/Transistor	82	918	2082
Fan		7	2993
Sewing Machine	1	5	2995
Cycle	1724	2496	504
Bullock Cart/animal cart	32	119	2881
Scooter / Motor cycle	1	5	2985
Water Pump	1	12	2998
Tractor	2	2	2998
Thresher	3	49	2951

Clocks / watches and cycles were the only 2 items which were acquired by many households. About 70% of the households have no access to electronic media as they do not possess any item like radio/transistor or television, Cycle, the common man's mode of conveyance has been acquired by more than 83% or the households. Agriculture equipments have not made their entry in the households in any significant manner.

The acquisitions made have not provided any major stride in development to the people of this area. However, they appear to have reached closer to the stage II of development. They have yet to go far for reaping the fruit or development and entering into stage IV.

10.6 Barriers and obstacle

The survey teams came across certain barriers and obstacles, which appeared relevant, both, to the field work of survey and to the generation of development process in the area. Some of these were:

1. The lower level staff of the block offices showed scant regard for the study to be undertaken at the instance of the central Govt. They did not part with the basic information on the number and location of minor irrigation projects.

   They were either scared of the exposure through impact report or were used to treat everything in a very casual manner.

2. The study teams did not find suitable place for overnight stay in most of the blocks. They had to travel to and fro almost which resulted in spending more money and time.

3. Most of the cultivators were sore about the dereliction/abandonment of the minor irrigation projects of their area. They felt that the Govt. was not showing proper concern for their repair or revival. In their opinion, it would be better if the Govt. takes appropriate steps for their revival first rather than embarking upon the new/additional schemes. Non-revival of the abandoned projects, according to good number of respondents was the cause stagnating their economic status which continued to suffer adversely due to rising costs.

4. Slackness in monitoring the functioning of the project was another cause of grouse among cultivators. They felt that as they suffer losses / damages due to non working of the projects, the govt. should also penalize those who were responsible for their maintenance and compensate them as well.

5. When questioned about their uncooperative attitudes in the scheme of Beneficiary Committees, they expressed their dismay about this system. They felt that mere information about the cost of repair and maintenance was not justifying cause for their contribution. Even if they contribute the set percentage cost, they did not foresee any guarantee for uninterrupted run of the project for some assured period.

10.7 Recommendations

Though the present study has been conducted by taking a sample of 3000 households exclusively of scheduled tribes, the recommendations should be such which should take into account the size of the normal population which is covered by these 6districts and the problems inherent with them.
Two main observations have emerged from this study. These are :

1. The average size of land holding sown is quite small, only around 2 acres per household.
2. The average area irrigated to the area sown came only about 46.4%. In other words, only 0.9 acres out of 2 acres was sown per household was being irrigated.

This followed the consequential out come that there was not enough work to engage heavy proportion of persons. The proportion of workers engaged in agriculture, was, therefore, found to be only 34%.
Among the workers, female workers turned out to be in fraction i.e. only 0.04%.

It is well recognized all over that irrigation is not only an important agent of change but also a harbinger of fortunes in agriculture. This, however, presupposes, among other things, the economic size of land, holdings. But in this instant case study, the size of land holding is not economical.

The fortunes of the people in these are not going to be changed even if the entire network of irrigation facilities is not only upgraded but also made fully operational and all the unmet need of irrigation are made fully met. The population would not be able to reach the stage IV of development. At the best, it would be swinging between stage II and stage III of development for the simple reason that the returns from the uneconomic land holdings available with the households would be limited. Furthermore, these holdings would be subjected to further sub-division on account of normal practice of inheritance. The plan for the development has be necessarily micro-based and must take these bare facts into account.

GVSS, therefore, makes the following recommendations:

GVSS strongly feels that small sized holding in the survey areas have not had any notable impact on economic development on account of minor irrigation projects and that these smallholdings do not hold any bright promise for future as well. It is time that these cultivators are encouraged to participate in agriculture related and rural based economic activity.

In view of this, both, short-term measures and long- term measures are considered necessary for the economic uplift of the target population.
The short-term measures are recommended for immediate help to the cultivators of survey areas and are related to the cultivation as their main occupation.

The long-term measures are suggested keeping in view the ground reality of small sized holdings, traditional habits cultivation, negligible impact of minor irrigation projects on their income and above all very bleak promise of their upliftment so long they are kept stringed to cultivation only. The long term measures, therefore, would attempt to wean them away from their only occupation and involve them in agriculture related and rural based economic activities.

A. Short-term measures

1. Arrangements be made on priority basis for meeting their un-met needs by ensuring the working of all existing minor irrigation works including those which have been either lying idle for want of repairs or abandoned.

2. There is an immediate need for creating wells in the following blocks as ground wells were not found there.:

Palkot	(Gumla)
Jhinkpani	(West Singbhum)
Samankhunta	(Mayurbhanj)
Khatra I	(Bankura)
Ranibandh	(Bankura)

3. There is a need for additional wells in the following development blocks listed in order of priority.:

Kuliana	(Mayurbhanj)
Hirbandh	(Bankura)
Bandhwan	(Purulia)
Sadar Chaibasa	(West Singbhum)
Manbazar I	(Purulia)
Patna	(Keonjhar)
Bangriposi	(Mayurbhanj)

4 The concept of the Beneficiary committees has not found favour with almost all the households. This needs modification so as to make it acceptable to the cultivating households.

5. Lack of proper monitoring and maintenance of minor irrigation works, specially in tribal inhabited areas should be made punitive for the officials assigned with this task. The room for leniency has resulted in high rate of dysfunctionality of the irrigation works.

6. Numerous households could not use water for irrigation purpose despite the water being available in the ponds/storage tanks for the simple reason that they lacked resources for buying long pipes and motors or even for hiring these items. Govt. should come forward to take a stock of this situation and offer some help.

7. The details about the number, name, location and the area served by each one of the minor irrigation project should be made available for every C.D. Block in the block office itself. The information should also be accessible to the general public for use and for general information and specially to the NGOs/survey agencies who are assigned the work of evaluation / assessment surveys by the central / state govt. This would help in realistic evaluation of the working of these schemes.

8. Number of villages visited by the field investigators were found to be deprived of public mode of transport. The households should be encouraged to run transport services. This, besides making the area accessible, would generate income for the participating households

B. Long term Measure:

IRRIGATION

1. All efforts should be made for utilizing the available water. Water experts hold the view that an increase of 10% of water use efficiency would lead to 15% increase in irrigated area. Hence, our first task should be directed towards water use efficiency of the water available at present. This can be done as under.

2. For increasing the proportion of consumptive use of available water, it is recommended that Water Users' Committees should be constituted representing few villages say 5 or so. This committee should look after the impounding of rainwater by ensuring proper erection and maintenance of bunds, embankments, drains, nalas so that the wastage of rainwater could be minimized.

3. For even distribution of available of water, location of diversion channels (not natural channels) should be reviewed and relocated. Also, check dams should be created at appropriate places to meet the needs of the areas.

4. Keeping in view the direction of the gravity of water flows and terrain, watersheds should be constructed.

5. For arresting out flows of rainwater on the ground and also from over flows of rivers, canals and streams etc., tiny dams say of 0.5-1 hac capacities should be constructed. Tiny dams scattered over the areas instead of one large one at one place would ensure easy access to water, even distribution of water, easy conveyance of water and prevent water losses from the point of delivery to the service pointed in the fields. Besides, a network of tiny dams would be a good source of recharging the vast land around them. Moreover tiny dams get filled up in less time and collect more

water than a big dam during rains. They present good cover to impound rainwater when rains fall in scattered areas.

It is held that 10 tiny dams of one hac. Capacity can collect more water and in more quick time they one big dam of 10 ha. Capacity.

6. Cultivators should be encouraged to dig large sized Water Collection Katcha Pits (rectangular pits) in their fields for creating additional source of water to be used, both for irrigation and for farm cattle. This is being suggested because this side of the country receives a good average rainfall around 1250 mm and abundant water becomes available for use except in Purulia.

7. For making provision for additional water to create additional irrigation potential, there is a need for reviving the existing schemes which have become dysfunctional due to some reasons:

Tube wells:

8. About 31% tube wells were found to be dysfunctional in the survey areas. Rate of dysfunctionality was highest in west Singhbhum and Gumla was next in order. Keonjhar is the next area where this action is needed. Immediate steps should be taken for reviving dysfunctional tube wells. Besides, most of the deep tube wells are owned by the Govt. Their maintenance should have been ensured.

9. As most of the shallow tube wells are owned by the individuals, Govt. is required to chalk out plan for their revival. The financial status of cultivators in these areas stands in way for their repairs. Once again, GVSS sees the solution in formation of Water Users Management committee. If set on proper footing these committees should be able to cut delays and ensure continuous functionality whenever the need for water is felt. The

committees can also ensure availability of water on mutually arranged loan/payment basis. The committee, in its wider implications, can become a nodal point for arranging water to the needy.

Tube wells as source of ground water irrigations are permanent source of water, their construction repair would a long way in enhancing irrigation facilities.

10. More tube wells are required in Khuntpani and Sadar Chaibasa Block of Jharkhand, Patna block of Keonjhar, Bangriposi and Kuliana blocks of Mayurbhanj, Hirbandh block of Bankura and ManbajarI and Bandhwan blocks of West Bengal. These are the blocks where area irrigated by tube wells work out to be less then 10% of the total area irrigated.

Other Wells:

11. Other wells including ground wells, dug wells and open wells presented a dismal picture. The survey discovered that about 72% of these wells were found dsysfunctional at the time of the survey. Looking at the rate of dysfunctionality, all the blocks need revival of the dead wells or alternatively new wells are to be created. In case the existing wells are to be rervived, all blocks (except the blocks in Mayurbhanj) need special programme for revival.

12. Involvement of women folks of the area is suggested for celebrating Water Festival on an annual basis Let the local administration organize a 'Water Charging' festival lasting for a week during the February-March every year. The women would carry water in pales and pour it into the wells, tanks, ponds, etc. for a week every day. This would **regenerate the moisture, compensate the evaporation loss and recharge the soil water. However, before the onset of the festival, desilting has to be done so that the bottom surface gets ready for recharging.**

Any auspicious day of February-March can be selected for the onset of festival in consultation with the local leaders.

The water needed for the festival can be drawn from local rivers, streams, canals, wet ponds, wet wells, handpumps etc.
Involvement of the community would create a sense of belonging and care to the locals.

13. Keeping in view the characteristics of the survey areas such as small holdings, less irrigation, massive illiteracy, poor economic status, traditional cultivation, non-participation of females in work, it is felt that there is an urgent need for developing a second vision which could generate income for providing humane living condition. GVSS recommends that a shift is cultivation pattern should be introduced in these areas for generating higher income from the existing holdings.

C. Development of Second Vision

The proposal for second vision could comprise of

1. Replacement of cultivation of traditional crops by Medicinal Herbs Cultivation. The Govt. should develop a programme of cultivation of herbs and also for developing herbal during industry.
2. There is also ample market for developing “floriculture”. The developments of floriculture will turn this area of smallholdings into vast land of flowerbeds, which would generate returns in gold from the greens.
3. Cultivation of aromatic plants.
4. Encourage agriculture related vocations like animal husbandry, hatcheries,
5. Encourage the families of cultivators who, for most of the time remain without any work to take up non-agricultural vocations such as.:

Folk metal craft under which several decorative and utility articles can be made. The skill is available in plenty among these folks.

- Rural industry such as handloom, khadi, rope making, paper **mache,** handicraft etc.
- Production of aromatic **flavours, scents** and herbal extracts.
- Preparation of Folk paintings for which these tribals are quite knowledgeable.
- Preparation of hand moulded models of terracotta crafts and metal wares.

6. For undertaking the above programmes skill are available and manpower is also available. The Govt. has to help in proper organizing and marketing. Perhaps this can be done by developing local growth cum production centers through organizing localized committees of local artsmen/ craftsmen.

7. Agriculture university and farm specialist available with the Govt. of these areas should be asked to work out the detailed modalities of the programme.

8. All efforts should be made to sensitise the cultivators for impounding maximum rain water. Govt. has a major role in providing project knowledge, strategies and execution.

Annexure I

List of Government officials / officers and other functionaries contacted during survey

S/No.	Name of District	Name of Persons	Designation
1	Bankura	Mr. G. A. Khan	District Magistrate
2		Mr. Biswanath Basu	ADM (Development)
3		Mr. Suparna Roy chowdhary	Block Development Officer (Hirbandh)
4		Mr. Ullas Chattapadhay	Block Development Officer (Ranibandh)
5		Ms. Sampa Dhar	Block Development Officer (Khatra I)
1	Purulia	Mr. Bhagwati Prasad Gopalika	District Magistrate
2		Mr. khudiram Das	ADM (Development)
3		Smt Mithu Singh Sardar	Sabhadipati
4		Mr. Nimai Chandra Sil	Block Development Officer (Manbazar I)
5		Mr. Swapan Kumar Mistri	Block Development Officer (Manbazar II)
6		Mr. Sanjeet Mandal	Block Development Officer (Bundwan)
1	Ranchi	Mrs.Sushuma Singh	Secretary Planning and Development
2		Mr. S. C. Lahiri	Advisor Planning
3		Mr. Sudhir Tripathi	Secretary Water Resources Deptt.
1	Gumla	Mr. Shasi Ranjan Kumar	Deputy Commissioner Gumla
2		Mr. Sharban Kumar Das	SDO Minor Irrigation Raidih
3		Mr. Sideshwar Prasad Singh	SDO Minor Irrigation Gumla & Palkot
4		Mr. Kedar Prasad Singh	Executive Engineer Minor Irrigation
5		Mr. Sukdev Prasad Singh	Block Development Officer Gumla
6		Mr. Basudev Prasad	Block Development Officer Raidih
7		Mr. Kela Orang	Senior Deputy Collector & Prog. officer
1	Paschim Singbhum	Mr. Amrandra Pratap singh	Deputy Commissioner Paschim Singbhum
2		Mr. Ashok Kumar	PA to Deputy Commissioner
3		Mr. Dayanand Singh	Superintendent Engineer Chaibasa
4		Mr. Ratia Manjhi	Block Development Officer Khuntpani
5		Mr. Devid Balthar	Block Development Officer Chaibasa Sadar
6		Mr. Javiar Harenj	Block Development Officer Jhikpani
1	Bhubeneswar	Mr.Vijay Kumar Patnaik	Secretary Water Resources Deptt.
2		Mr.Gyana Ranjan Dash	Joint Secretary Water Resources Deptt.
1	Keonjhar	Mr. D. G. Tripathy	Deputy Magistrate Keonjhar
2		Mr. Loknath Saha	Project Administrator ITDA
3		Mr. Ashok Mahanty	Executive Engineer Minor Irrigation
4		Mr. Aswani Kumar Naik	Block Development Officer Ghatgaon
5		Mr. Ismal Tudu	Block Development Officer Patna
6		Mr. Parmananda Panigrahi	Block Development Officer Harichandanpur
1	Mayurbhanj	Mr .Santosh Kr. Mahapatra	Executive Engineer Minor Irrigation
2		Smt.CTM. Suguna	Deputy Magistrate Mayurbhanj
3		Smt.Maheswari Sethi	Project Administrator ITDA
4		Mr.S. C. Gartia	District Agriculture Officer
5		Mr. A. K. Manik	Block Development Officer Kuliana
6		Mr. Shasi Bhusan Basa	Block Development Officer Bangriposhi
7		Mr. Sudir Kr. Mandal	Block Development Officer Shamakhunta
8		Mr. M. M. Majhi	District Statistical Officer
9		Mr. Kanu Barik	Junior Agriculture officer Bangriposi
10		Mr. Manoj Kr. Chand	Junior Agriculture officer Kuliana
11		Mr. Bijay Kr. Samal	Junior Agriculture officer Samakhunta

Annexure II

Project Staff

	Name	Designation
1.	Shri R. K. Bhatia	Project Director
2.	Shri Subrata Kumar Kundu	Project Co-coordinator
3.	Dr. Manoj Roy Choudhary	Agricultural Expert
4.	Shri Dilip Choudhaty	Agricultural Expert
5.	Shri Biswanath Ghosal	Field Supervisor
6.	Shri Pradip Malick	Field Investigator
7.	Shri Subir Kumar Das	Field Investigator
8.	Shri Depankar Bhowmick	Field Investigator
9.	Shri Alok Sarkar	Field Investigator
10.	Shri Sadan sarkar	Field Investigator
11.	Shri Sajal Mitra	Field Investigator
12.	Shri Debobrata Kumar Kundu	Computer Programmer
13.	Smt Shibani Kundu	Computer Programmer
14.	Shri Rupak Malakar	Computer Programmer
15.	Shri Subhashis Pandey	Computer Data Operator
16.	Shri Arijeet Sengupta	Computer Data Operator
17.	Shri Rony Choudhary	Computer Data Operator

Annexure III

Block Schedule

1. Name of the Block: _____ **2. Name of the District:** _____

3. Name of State: _____

2. **Land Use** **2000-2001 (Hectares & Acres)**

2.1	Total Geographical area according to village Papers (in Hectares & Ares)	: _____
2.2	Area not available for cultivation	: _____
2.3	Other uncultivable land excluding fallow lands	: _____
2.4	Net area sown	: _____
2.5	Area sown more than once	: _____
2.6	Net area irrigated	: _____

3. Area irrigated under minor irrigation sources (Hectares and Acres)

Source of Irrigation	**Area Irrigated**	
	1995-96 Hectares Ares	**2000-01 Hectares Ares**
3.1 Ground Water		
(a) Tube Wells		
(b) Open Wells		
(c) Artesian Wells		
(d) Other Wells (specify		
(e) Total Wells		
3.2 Surface Water		
(a) Tanks and Reservoirs		
(b) Rivers, Canals and Streams		
(c) Hilly channels		
(d) Diversion Channels		

4. Minor Irrigation Projects completed

Name of Works	Works Completed			
	Up to 1995-96		During 1995-96 to 2000-01	
4.1 Ground Water	Nos. Completed	Irrigation Potential (Area) Hect Ares	Nos. completed	Irrigation Potential (Area) Hect Ares
(a) Open Wells				
(b)Tube Wells				
(c) Artesian Wells				
(d) Other Wells (Specify)				
(e) Total Wells				
4.2 Surface Water				
(a) Tanks & Reservoirs				
(b) Rivers, Canals& Streams				
(c) Hilly Channels				
(d) Diversion Channels				

5. Minor Irrigation Projects under construction after 1995-96

Project	Nos.	Expected to be completed in (Give Year)	Expected additional Irrigation Potential Hect Ares
5.1 Ground Water Works			
(a) Tube Wells			
(b) Open Wells including repair, boring, deepening			
(c) Artesian Wells			
(d) Other Wells (specify)			
(e) Total Wells			
5.2 Surface Water Works			
(a) Storage Works (Tanks & Reservoirs)			
(b) Streams & Canals			
(c) Hilly Channels			
(d) Diversion Works			

6. Irrigation Potential and area irrigated. (Hectare & Ares)

Mode	2000-2001		2001-2002		Reasons, if any for gap in potential and Irrigated	
6.1 Ground Water	Potential Hect. Ares	Irrigated Hect Ares	Potential Hect. Ares	Irrigated Hect Ares	2000-01	2001-02
(a) Tube wells						
(b) Open wells						
(c) Artisans Wells						
(d) Other wells						
(e) Total wells						
6.2 Surface Water						
(a) Storage Works (Tanks & Reservoirs)						
(b) Streams & Canals						
(c) Hilly Channels						
(d) Diversion Works						
OR						
(a) Tanks or eservoirs						
(b) Rivers, Canals & Streams						
(c) Hilly Channels						
(d) Diversion Works						

7. Water Logging

	1995-96 Hect. Ares	2000-01 Hect. Ares
(a) Estimated area under Water logging		
(b) Estimated loss of area for cultivation		

8. Drinking and Industrial Use

Year	Total Ground Water Resources (Hectares)	Quantity of Ground Water resources for Drinking and Industrial Use (Hectares)
1995-1996		
1996-1997		
1997-1998		
1998-1999		
1999-2000		
2000-2001		

9. Maintenance & Repair **Up to March 2001**

(a) No. of Beneficiary Committees:

(b) Total Members of Beneficiary Committees:

(c) No. of Beneficiary Committees trained:

(d) No. of Members of Beneficiary Committees trained:

(e) % Contribution fixed for beneficiaries towards maintenance and repairs, if any:

(f) % of beneficiaries contributing towards the expenditure:

(g) General observations of the beneficiaries towards this contribution:

Willing (%): unwilling (%):

10. Demographic Details **Census 1991/2001**

(a) No. of Households (1991/2001)

(b) Total Population (1991/2001)

Males:

Females:

Total:

(c) Total ST Population

Males:

Females:

Total:

(d) Total SC Population

Males:

Females:

Total:

(e) Population by religion

Hindus:

Muslims:

Christians:

Annexure IV

Village Schedule

Part A: Identification Details:

1. Name of Village: _____ 2. Village Code: _____

3. Name of Block: _____ _ 4. Name of District: _____

5. Name of State: _____

Part B: General Particulars

1. Land Use:

Total cultivable Area : _____

(a) Net Area Sown : _____

(b) Area Sown more than once : _____

(c) Net Area Irrigated : _____

2. Mode of Irrigation **Area Irrigated**

2.1 Ground Water Works	**1995-96 Hectares Acres**	**2000-2001 Hectares Acres**
(a) Tube Wells		
(b) Open Wells		
(c) Artesian Wells		
(d) Other Wells (specify)		
(e) Total Wells		
2.2 Surface Water Works		
(a) Storage Works (Tanks & Reservoirs)		
(b) Rivers, canals and streams		
(c) Hilly Channels		
(d) Diversion Works		
(e) Other works (specify)		

3. Location of Irrigation Works **Nos.**

3.1 Ground Water Works in Operation	1995-96	2000-01
(a) Tube Wells		
(b) Open Wells		
(c) Artesian Wells		
(d) Other Wells		
(e) Total Wells		
3.2 Surface Water Works in Operation		
(a) Storage Works (Tanks & Reservoirs)		
(b) Rivers, canals& streams		
(c) Hilly Channels		
(d) Diversion Works		
(e) Other works (specify)		

3.3 Other Irrigation Works if any (specify)

(a) _____

(b) _____

(c) _____

1. New Works under Construction as on 30/06/2003

New irrigation works **4.1 Ground Water works**	**Nos.**	**Expected to be completed in (Give Year)**	**Expected irrigation Potential (Hectares)**
(a) Open Wells			
(b) Tube Wells			
(c) Artisan Wells			
(d) Other Wells			
(e) Total Wells			
4.2 Surface Water Works			
(a) Storage Works (Tanks&Reservoirs)			
(b) River Canals & Streams			
(c) Hilly Channels			
(d) Diversion Channels			
(e) Other Works (Specify)			

5. Utilisation of Available Irrigation Facilities (Hectares/Acres)

Minor irrigation works **5.1 Ground Water Works**	**Irrigation Potential** **1995-96** **Hect./Ares**	 **2000-01** **Hect./Ares**	**Irrigation Utilisation** **1995-96** **Hect./Ares**	 **2000-01** **Hect./Ares**
a) a)Tube Wells				
b) Open Wells				
c) Artesian Wells				
d) Other Wells (Specify)				
e) Total Wells				
5.2 Surface Water Works				
(a) Storage Works (Tanks & Reservoirs)				
(b) Rivers, canals& streams				
(c) Hilly Channels				
(d) Diversion Works				
(e) Other works (specify)				

6. Non-functional old Irrigation Works requiring Maintenance & Repairs As on 30.06.2003

Minor irrigation works requiring repairs **6.1 Ground Water Works**	**Nos**	**Non-functional (since)** Year	 Months
(a) Tube Wells			
(b) Open Wells			
(c) Artesian Wells			
(d) Other Wells			
(e) Total Wells			
6.2 Surface Water Works			
(a) Storage Works (Tanks & Reservoirs)			
(b) Rivers, Canals, &Streams			
(c) Hilly Channels			
(d) Diversion Channels			
(e) Other works (specify)			

7. Irrigation Potential and Irrigation Utilisation

Minor irrigation works **7.1 Ground Water Works**	Irrigation Potential (Hectors) 1995-96	 2000-01	Irrigation Utilisation (Hectors) 1995-96	 2000-01
(a) Tube Wells				
(b) Open Wells				
(c) Artesian Wells				
(d) Other Wells				
(e) Other Works (specify)				
7.2 Surface Water Works				
Storage Works (Tanks & Reservoirs)				
Rivers, Canal, &Streams				
Hilly Channels				
Diversion Channels				
Other Works (specify)				

8. Beneficiary Committee

(a) Does Beneficiary Committee exist? yes ☐ No ☐

(b) Number of Members of Beneficiary Committee: _____

(c) How many members have been trained up to 2000-01: _____

(d) Do members of Beneficiary Committee Contribute?
towards maintenance/repair cost? Yes ☐ No ☐

(e) If yes, rate of Contribution (%) of cost: _____

(f) Do members default in Payment? Yes ☐ No ☐

(g) If yes, estimated default rate (% members in 2000-01) _____

(h) Reasons for Default if any. (Give 2 main reasons) _____

(i) Do not trust cost of repairs

(ii) Cannot afford

(iii) Want Govt. to bear Cost

(iv) Not satisfied with the quality of Repairs

(v) Other reasons, if any (please specify)

9. Drinking Water facilities in Village

	Estimated % households	
	1995-96	2000-01
Wells		
Tube Wells		
Hand Pump		
Storage Water		
Canal Water		
Tap Water		

10. Economic Status

	Estimated % households	
	1995-96	2000-01
Below Poverty Line		
Average		
Middle Class		
High Middle Class		
Rich		

11. Demographic Details

(a) No. of House holds (1991/2001)

(b) Total Population 1991/2001

Males:

Females:

Total:

(c) Total ST Population

Males:

Females:

Total:

(d) Total SC Population

Males:

Females:

Total:

(e) Population by religion

Hindus:

Muslims:

Annexure V

Household Schedule

Part A: Identification Particulars

1. Name of Village: _____ 2. Name of Block: _____

3. Name of District: _____ 4. Name of State: _____

Part B: Household Particulars

1. Household No.: _____ 2. Name of head of household: _____

3. Religion: _____ 4. SC ☐ ST ☐ Other ☐

5. Members in Household: Males ☐☐

Females ☐☐

Total ☐☐

6. Household details:

S.L No.	Name of member	Age	Sex	Educational Level	Marital Status	Activity Occupation	Days of illness During 2002-03	Does any one possess Symptoms
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Educational Level: (1) Below Primary (2) H.S. (3) Graduate (4) P.G. (5) Tech. Certificate / Degree

Act Occupation: (1) Cultivation (2) Wage Labourer (3) Other Work (4) Household duties (5) Students (6) Dependents (7) Retired/Pensioners

Illness: (1) Gastroenteritis (2) Cholera (3) Jaundice (4) Typhoid

Symptoms: (1) Sleep disorders (2) Irritative & Argumentative (3) Withdrawal from work/activity (4) Suspicious with strange odd behaviour (5) Lack of personal hygiene (6) Turns violent (7) Does not listen any advice

This is a multiple response question write codes for most prominent symptoms write maximum 4 codes

7. Area of Land available for cultivation in:

Type of Tenure	1995-96 Hec Acr.	1996-97 Hec Acr.	1997-98 Hec Acr	1998-99 Hec Acr	1999-2000 Hec Acr	2000-01 Hec Acr
Owned						
Rented/Leased						
Total						

8. Area of Land Sown and Irrigated (in Hectares)

Year	**Area Sown**		**Area Irrigated**	
	Net Area sown Hec Acr	Area Sown more than once Hec Acr	Net Area Irrigated Hec Acr	Area irrigated More than once Hec Acr
1995-1996				
1996-1997				
1997-1998				
1998-1999				
1999-2000				
2000-2001				

9. Irrigation needs and Potentials

Year	Area needed to be irrigated Hec Acr	Area actually Irrigated Hec Acr	Main Source of Irrigation (1) Ground Water (2) Surface Water	Was any Potential Available for irrigating Additional Area Yes (1) / No (2)
1995-1996				
1996-1997				
1997-1998				
1998-1999				
1999-2000				
2000-2001				

10. Estimated value of crops (Rupees)

Year	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001
Value						

11. Financial Status

11.1 Loan for cultivation / land, house purchase / machinery / conveyance

Year	Amount of Loan taken (Total)	Source of Loan With Loan amount		
		Govt. agencies Including banks/ Coops.	Relatives & Others Family Friends	Sources (Specify)
1995-1996				
1996-1997				
1997-1998				
1998-1999				
1999-2000				
2000-2001				

11.2 Loan for family functions

Year	Amount of Loan taken (Total)	Source of Loan With Loan amount		
		Govt. agencies Including banks/ Coops.	Relatives & Family Friends	Others Sources (specify)
1995-1996				
1996-1997				
1997-1998				
1998-1999				
1999-2000				
2000-2001				

12. Household acquisition during 1995-96 to 2000-2001

12.1 Acquired more land and Property:

	Year of Acquisition					
Acquisition	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01
Land new house enlarged existing house						

12.2 Acquired agricultural equipments:

Equipments	Year of Acquisition					
	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001
Tractor						
Trolly						
Water Pump						
Thresher						
Any other (Specify)						

12.3 Acquired Conveyance:

Conveyance:	**Year of Acquisition**					
	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001
Jeep/Car/4 wheeler /other						
Motor Cycle						
Bullock Cart/Horse Cart						
Cycle						
Any other (Specify)						

12.4 Acquired durable goods:

Goods	**Year of Acquisition**					
	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001
Clock/Watch						
Electric Fan						
Radio/Transistor						
Sewing Machine						
Television						
Refrigerator						
VCR/VCP/VCD						
Computer						
Telephone						
Any other (specify)						

13. Impact on main source of drinking water

13.1 Source	**1995-1996**	**2000-2001**
a) Well/Tube well/Hand pump		
b) Tanks/River/Canal, etc		
c) Tap Water		
d) Any other (specify)		

13.2 Impact on distance travelled for bringing Drinking Water

Source	**Distance travelled in**	
	1995-1996	**2000-2001**
a) Well / Tube well / Hand pump		
b) Tank/River/Canal, etc.		
c) Tap Water		
d) Any other (specify)		

14. Impact fuel used for cooking:

Fuel used	Year	
	1995-1996	2000-2001
a) Electricity		
b) Gas (LPG)		
c) Kerosene		
d) Firewood		
e) Charcoal		
f) Any other (specify)		

15. Impact on Toilet Facility:

Toilet	Year	
	1995-1996	2000-2001
a) Outside House		
b) Inside House		

16. Maintenance

16.1 Is there any scheme for the maintenance of Minor Irrigation Works? Yes / No

16.2 If so, is it for:

(a) Privately Owned Works ☐
(b) Govt. Owned / funded Works ☐
(c) All Works ☐

16.3 How the maintenance /repair expenditure is met?

(a) Govt. Sources ☐
(b) Private Sources ☐
(c) Contribution from Beneficiary ☐
(d) Govt. and contribution from Beneficiaries ☐

16.4 The share of contribution by the beneficiary:

(a) Less than 10 % ☐
(b) 10% to 20% ☐
(c) 20 % and above ☐
(d) Depending upon the maintenance/repair Cost ☐
(e) None ☐

16.5 What has been your share in?

Ye	%	Amount
1995-1996		
1999-2000		
2000-2001		

16.6 **Are you member of any beneficiary Committee?** Yes (1) ☐ No (2) ☐

16.7 **Have you received any training as a member of Beneficiary Committee?** Yes (1) ☐ No (2) ☐

17. **Improvement in Irrigation Facilities:** Yes (1) ☐ No (2) ☐

17.1 **Have the Irrigation Facilities of your Village improved In comparison to 1995-1996?** Yes (1) ☐ No (2) ☐

17.2 **If yes, in what way**

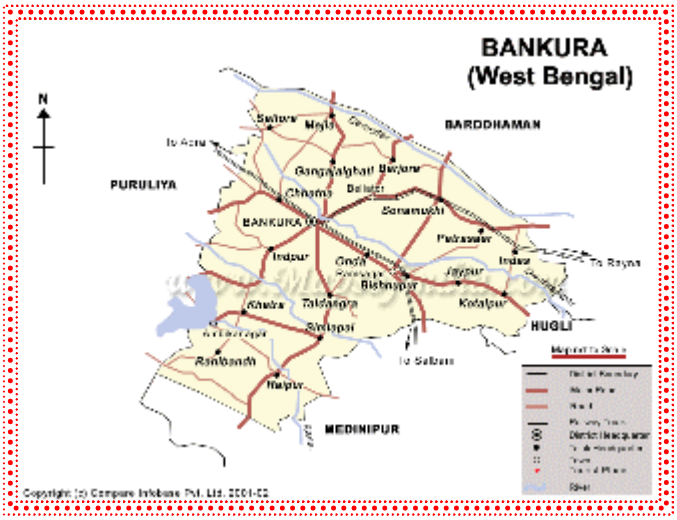
(a) Old open wells have been repaired. ☐
(b) New Open wells have been bored. ☐
(c) Old Wells have been deepened. ☐
(d) Artesian Wells have been constructed / repaired. ☐
(e) Old Storage Works have been repaired. ☐
(f) New Storage Works have been constructed. ☐
(g) New Diversion Works have been constructed. ☐
(h) Any other (specify) ☐

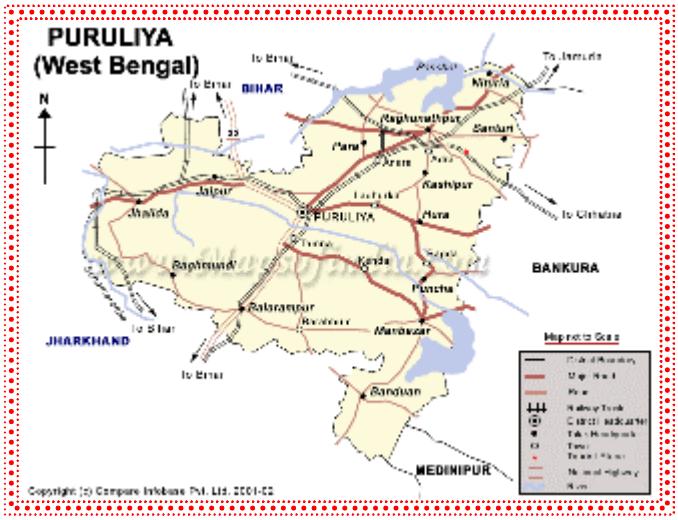
17.3 **Due to improvement in irrigation facilities as reflected in 17(1) and 17(2) did you face problems such as:** Yes (1) /No (2)

(a) Finance for Investment
(b) Undue Wait-in-Period for use of facility
(c) Local Disputes
(d) Official apathy / interferences

18. **Do you think:**	**Yes (1)**	**No (2)**
(a) There is a need for more Irrigation Facilities.	Yes (1)	No (2)
(b) Govt. shows adequate understanding of your irrigation needs.	Yes (1)	No (2)
(c) Govt. keeps a watch on the condition of Ground Water Sources.	Yes (1)	No (2)
(d) Present Source of Irrigation is properly maintained.	Yes (1)	No (2)
(e) If No in (c) above, how this can be achieved and by which agency. Your view	Yes (1)	No (2)
(f) Should you be required to contribute towards maintenance?	Yes (1)	No (2)
(g) Irrigation Facilities available at present are better than in 1995-96 i.e. about 7 years ago.	Yes (1)	No (2)
(h) You are financially better now than in 1995-96.	Yes (1)	No (2)
(i) Health wise your family faces less bouts of illness than 7 years back.	Yes (1)	No (2)

Name of Investigator_____ **Date**_____





Total Population & ST Population in District Bankura West Bengal

Name of Dist .& Block	Total Population	Male	Female	Total ST Population	Male	Female	% of ST Population
Bankura	**2805065**	**1437515**	**1367550**	**288003**	**145997**	**142006**	**11%**
Khatra I	**76149**	**39165**	**36984**	**18587**	**9522**	**9065**	**24%**
Dharra mouli	940	473	467	598	307	291	63%
Shivrampur	268	137	131	252	132	120	94%
Kumarbahal	430	235	195	273	140	133	63%
Barahguttee	449	248	201	365	199	166	81%
Hirband	**62216**	**32049**	**30167**	**19291**	**9884**	**9407**	**31%**
Khandarani	768	409	359	521	273	248	67%
Uganpathar	434	214	220	274	133	141	63%
Masanjhar	774	444	330	371	233	138	48%
Itamara	460	245	215	299	159	140	65%
Ranibandh	**93748**	**48095**	**45653**	**44833**	**22755**	**22078**	**48%**
Budkhila	1075	528	547	982	484	498	91%
Bikramdihi	875	439	436	373	189	184	42%
Ghagra	1169	638	531	485	256	229	41%
Garra	692	344	348	509	252	257	73%

Total Population & ST Population in District Purulia West Bengal

Name of Dist .& Block	Total Population	Male	Female	Total ST Population	Male	Female	% of ST Population
Purulia	**2224577**	**1142771**	**1081806**	**427766**	**218020**	**209746**	**20%**
Manbazar I	**117550**	**59940**	**57610**	**27188**	**13834**	**13354**	**23%**
Khiriyapara	447	225	222	268	136	132	59%
Ramnagar	739	376	363	267	140	127	36%
Jalahari	183	96	87	183	96	87	100%
Akhaypur	460	246	214	253	134	119	55%
Manbazar II	**78952**	**40479**	**38473**	**39649**	**20358**	**19291**	**50%**
Durjaypara	457	214	243	235	115	120	51%
Singraidih	543	281	262	538	277	261	99%
Borokodom	977	478	499	717	344	373	73%
Pratappur	696	354	342	570	281	289	81%
Bandwan	**73043**	**37140**	**35903**	**37831**	**19071**	**18760**	**51%**
Patkita	443	232	211	214	112	102	48%
Makopali	515	246	269	515	246	269	100%
Dhadka	1374	739	635	335	176	159	24%
Kunchia	1729	882	847	1088	542	546	62%

Source:1991 Census

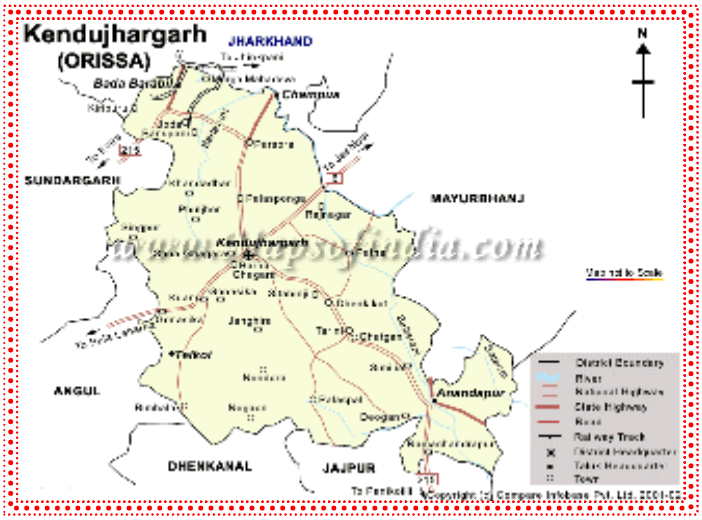
Total Population & ST Population in District Gumla , Jharkhand

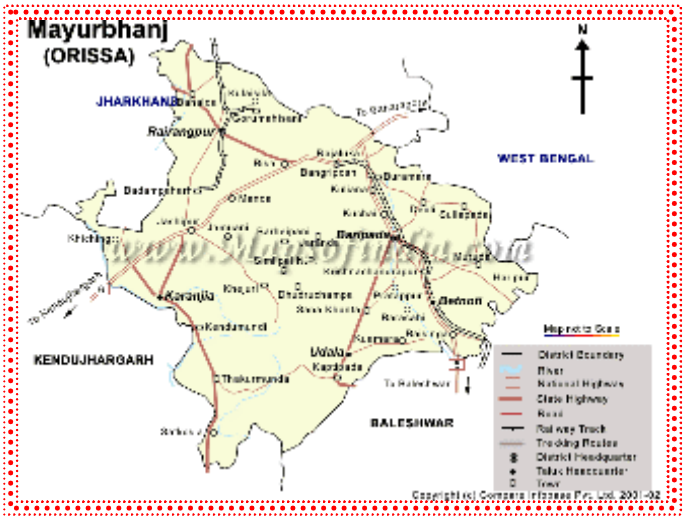
Name of Dist .& Block	Total Population	Male	Female	Total ST Population	Male	Female	% of ST Population
Gumla	**1153976**	**580729**	**573247**	**816988**	**408004**	**408984**	**71%**
Raidih	**55600**	**27836**	**27764**	**36460**	**18193**	**18267**	**65%**
Katkaiya	940	477	463	924	469	455	98%
Masgaon	572	291	281	404	209	195	70%
Kasher	2993	1513	1480	1542	765	777	51%
Kiradih	689	346	343	655	331	324	95%
Gumla Sadar	**104391**	**52275**	**52116**	**67580**	**34568**	**33012**	**64%**
Kharka	1397	744	653	881	471	410	63%
Naditoli	240	119	121	238	118	120	99%
Paharpanari	827	418	409	391	201	190	47%
Kharo	2622	1333	1289	1475	729	746	56%
Palkot	**61712**	**31675**	**30037**	**37330**	**18775**	**18555**	**61%**
Bhorataly	586	297	289	318	163	155	54%
Sologa	513	250	263	296	136	160	57%
Bhangra	1529	781	748	1279	643	636	83%
Nathpur	3403	1711	1692	2101	1032	1069	61%

Total Population & ST Population in West Singhbhum, Jharkhand

Name of Dist .& Block	Total Population	Male	Female	Total ST Population	Male	Female	% of ST Population
West Singbhum	**1787955**	**909796**	**878159**	**978069**	**488892**	**489177**	**55%**
Jhinkpani	**53272**	**26373**	**26899**	**36805**	**18113**	**18692**	**69%**
Paharbhaga	560	257	303	413	193	220	73%
Gurra	2144	1056	1088	1238	566	672	57%
Nwagaon	2725	1436	1289	1805	938	867	66%
Charabasa	381	192	189	261	132	129	68%
Chaibasa Sadar	**57409**	**28813**	**28596**	**46585**	**23208**	**23377**	**81%**
Domardiha	496	238	258	486	237	249	97%
Tolgosai	565	274	291	484	241	243	85%
Donkasai	608	330	278	460	249	211	75%
Purnia	531	249	282	403	194	209	75%
Khuntpani	**57225**	**28259**	**28966**	**47918**	**23573**	**24345**	**83%**
Katsona	775	365	410	651	301	350	84%
Gundai	443	209	224	353	167	186	79%
Jonkasasan	357	176	181	337	171	166	94%
Keodichalan	1095	528	567	911	439	472	83%

Source: 1991 Census





Total Population & ST Population in District Keonjhar, Orissa

Name of Dist .& Block	Total Population	Male	Female	Total ST Population	Male	Female	% of ST Population
Keonjhar	**1337026**	**677480**	**659546**	**595184**	**297951**	**297233**	**45%**
Patna	**81221**	**40239**	**40982**	**41972**	**20772**	**21200**	**51%**
Keapara	370	179	191	286	137	149	77%
Kenduapara	546	263	283	518	245	273	95%
Swam	736	364	372	393	188	205	53%
Koinda	778	388	390	426	220	206	54%
Harichandanpur	**99563**	**50358**	**49205**	**54340**	**27398**	**26942**	**54%**
Dhanberi	336	154	182	316	142	174	94%
Haridagota	694	358	336	687	354	333	98%
Chakradharpur	833	416	417	461	228	233	55%
Kalimati	678	343	335	395	202	193	58%
Ghatgaon	**87826**	**44164**	**43662**	**55122**	**27464**	**27658**	**63%**
Murgapahari	697	349	348	620	310	310	88%
Nalabila	745	369	376	420	216	204	56%
Baiganpal	1098	551	547	745	377	368	67%
Baidyamupasi	1068	509	507	637	320	317	59%

Total Population & ST Population in District Mayurbhanj, Orissa

Name of Dist .& Block	Total Population	Male	Female	Total ST Population	Male	Female	% of ST Population
Mayurbhanj	**1884580**	**952183**	**932397**	**1090626**	**546349**	**544277**	**58%**
Bangriposi	**77492**	**39084**	**38408**	**53018**	**26606**	**26412**	**68%**
Bounsbudhi	460	236	224	272	151	121	59%
Kasaibeda	266	132	134	253	124	129	95%
Darkontia	838	440	398	654	338	316	78%
Dighi	393	207	186	334	174	160	84%
Kuliana	**75477**	**38669**	**36808**	**49408**	**25165**	**24243**	**65%**
Andhari	1333	691	642	454	232	222	34%
Katsirisi	1084	526	558	816	398	418	75%
Dumurdiha	1447	714	733	989	473	516	68%
Haldia	488	255	233	408	219	189	83%
Sanmakhunta	**56689**	**28606**	**28083**	**38042**	**19086**	**18956**	**67%**
Khandia	787	388	399	730	361	369	92%
Bounsbila	2461	1227	1234	2347	1170	1177	95%
Alubeni	371	185	186	367	183	184	98%
Kendua	1356	707	649	1134	600	534	83%

Source: 1991 Census