

ASSESSMENT OF PARTICIPATORY GROUND WATER& CROP PLANNING

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MBA RM 07

Introduction

Macro Reason (Jharkhand, District, Block)

Jharkhand is a state which is called “the land of forest” state of India, located in the northeastern part of the country. Jharkhand is bordered by the states of Bihar to the north, West Bengal to the east, Odisha to the south, Chhattisgarh to the west, and Uttar Pradesh to the northwest. Its capital is Ranchi. According to the census 2011, the total population of Jharkhand was around 32,988,134 and 16.51% population lives in urban areas. The total population growth of this decade was 22.42% while it was 23.19% in the previous decade. The sex ratio of the state is 948. Overall literacy rate in Jharkhand is 66.41%. Percentage in which male has 7.84% while Female has 55.42%.

Jharkhand is endowed with surface water and groundwater, fertile land, and a moderate climate, all of which have helped the state build a strong agriculture sector. The state's agricultural-development programs have especially emphasized the raising of livestock for meat. More than one-fourth of Jharkhand's land area is forested.

Organization Profile

- Vikas Sahyog Kendra evolved from a larger campaign on water resources and a Drought Proofing Campaign (Sukha Mukti Abhiyan) in Palamu District, in the early nineties. The Campaign was anchored by Pani Chetna Manch, a forum of NGOs, social activists, researchers, engineers and scientists. Most founder members of VSK were associated with Sukha Mukti Abhiyaan. This program was implemented in the entire Palamau district between 1992 to 1996 by tripartite partnership of district administration, village community (Pani Panchayat) and Pani Chetna Manch. Over this period the Manch constructed 140 water-harvesting structures in 125 villages, as a large-scale demonstration of local water management as an effective alternative to the building of large dams. The Manch also provided technical and social support to the forest department in the construction of water harvesting structures. Pani Chetna Manch transformed into Vikas Sahyog Kendra as a registered organization in 1997. Since its formal registration as a non-profit Society in 1997, VSK has been working in three districts – Palamau, Latehar and Garhwa that constituted the erstwhile Palamau district.
- Mission: Enabling the vulnerable and voiceless communities to assert rights and develop their capacity.
- Vision: Creation of a society based on justice and free from poverty and exploitation

Reason of study area (Chuchrumad)

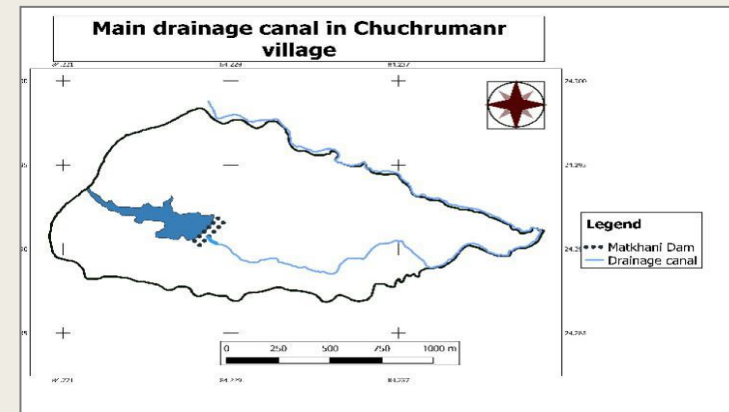
The village has a total population of 609 people of which male and female population are 295 and 314 respectively, which reside in 102 households. Around 97.04% of the total population Scheduled Tribe communities. Male literacy in the village is 66.81% whereas the literacy rate among women stands at 43.25%. Majority of the people reside in the northern part, particularly the Charkutba tand, Purab Tola, Karjivabel tand, Hartangi peepar and Pathal gadhi. The major economy of the villagers is generated from agricultural activity, however, many households practice goat rearing, dairy rearing. Although the migration in the village is less but few villagers migrate out of the village as labors; either agriculture laborers or non-agricultural laborers.

DEMOGRAPHIC SNAPSHOT OF CHUCHRUMAR

- ▲ TOTAL NUMBER OF HOUSES- 102
- ▲ TOTAL POPULATION- 609
- ▲ TOTAL MALE- 295
- ▲ TOTAL FEMALE- 314
- ▲ MALE LITERACY- 66.81%
- ▲ FEMALE LITERACY- 43.25%
- ▲ TOTAL MALE WORKERS- 152
- ▲ TOTAL FEMALE WORKERS- 156

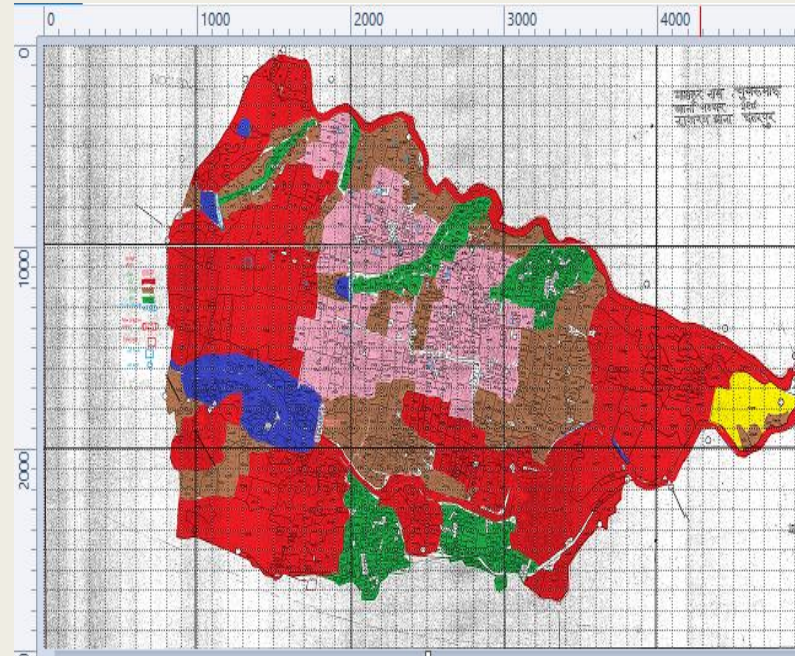
About Mathkhani Dam

- Mahtani Dam is the Main source of Surface water at the time of visit and the rest of the water bodies were dry. It is South west side of Chuchrumanr Village. The total Submergence area of the Mathkhani Dam is almost 9.5 hectares and the maximum depth was at the time of visit was about 3 meters near at the Dam. The Mathkhani Nala Drains from South west to East in the Chuchrumar.



Land uses and pattern

Land Use, Land Cover	Area in Hectares	Percentage out of Total	Remarks
Forest	11	4.82	Includes all land classes as forest.
Agriculture	106	46.49	Includes the net sown area.
Irrigated land	50	21.93	Include in Jaah & Chaur land
Un irrigated Land	55	24.12	Include in Taad & Bari land
Non- Agriculture	6	2.63	Includes all land occupied by Stones. Rocks



SN	Type of Land	Area in Hectare
1	Bari (Pink)	30.53
2	Tanr (Red colour)	83.25
3	Chaur (Soil)	32.04
4	Jah (Green)	18.42

■ Literature review

Participatory Groundwater Management (PGWM) is a collaborative program between Community and partner NGOs across India to build a sustainable model for groundwater management. Groundwater is a common pool resource (CPR) by definition, but its management seldom reflects CPR principles. PGWM is an aquifer-based and community-centric approach that has emerged as an alternative for managing groundwater as a common pool resource. The current, conventional knowledge base on groundwater has little space to fill the existing gaps between what is desired in practice and policy and the academic pedagogy of groundwater. This major challenge is addressed in the program by enabling the local communities to take informed decisions about water use, cropping patterns and crop water management through water budgeting.

■ **Participatory Groundwater Management: Lessons from Programmes Across India**

- Amrtha kasturi rangan, January 27, 2016:
- Amrtha kasturi Rangan in his research found out that there is annual extraction of water is 230 cubic kilometers from the groundwater in India. Also, there is unregulated water extraction so, there is water scarcity and distress.
- The major finding of study is:
- Annual Extraction 230 cubic kilometers, largest ground water user (India), Unregulated water extraction led 60% districts affected by Scarcity or quality issues, PGWM programme has been tested which increase the Ground water level, improved productivity
- Economic Impact of Participatory Groundwater Management: A Case Study on Andhra Pradesh Farmer Managed Groundwater Systems Project, Kolla Sravanthi, Stijn Speelman* and K B Umesh, December 2015
- Community-level institutions have become more assertive in the management of local resources, has significantly increased on farm employment, but there is no significant impact on the net farm income, on crop diversification and water use.
- Institutionalizing Groundwater Management: A Tale of Three Participatory Models in Andhra Pradesh, M. Srinivasa Reddy, V. Ratna Reddy, R.V. Rama Mohan, May 2012
- the social regulation approach works better for sustainable groundwater management when compared to the knowledge intensive approach encouraging water sharing between well owners and others would result in achieving the twin objectives of conservation and improved access with equity.

Literature Review

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Objective and research questions

- To estimate the water availability from different water resources in the Chuchrumar Village
 - To identify which have less water requirement the of crops
 - Based on the water availability to do the crop planning
 - To understand cropping pattern of farmers
 - To understand irrigation system of farmers
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- What is the seasonal cropping pattern in village?
 - What are the major components in the present Ground water?
 - Water are the major crops they are growing
 - Time of an irrigation crop
 - Source of irrigation in village
 - Type of irrigation in village

Methodology and Process

- My study is to estimate the water in the Mathkhani Dam and the wells in Chuchrumanr Village and in accordance with the water availability do the social advocacy in water use and change in crop pattern so that even after the rainy season the water scarcity could not rise. And the maximum sown area could be irrigated.
- **Study type** This is a qualitative and qualitative study. In this study, there is descriptive research is designed for data collection of the information
- **Study design:** Is a mixed method using both Qualitative and quantitative data
- **Area of study:** One village of chhatterpur block of palamu district name of village is chuchrumad
- **Source of data:** The study is done on primary research well secondary research
- **Primary Data**
- The primary data has been taken by conducting informal meeting, Households survey, focus group discussion, community meeting and, observation. The farmers groups where the main targets whom this study was taken.
- **Secondary Data**
- The secondary data was collected from books, journals, and government statistics report. The questionnaires are designed to collect the data to keep in view the objective of the study.
- **Design of the questionnaire:** The questionnaire designed to collect the data to keep in view the main objective of the study. It is mostly closed ended and open-ended short question

Analysis and Findings

- Now we have information of the water availability in surface and ground both. Now the next steps would be calculation the water requirement in every households in irrigation, Though water budgeting

Name of Crop		Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Wheat		Irrigation	Irrigation	Harvesting	Harvesting						Ploughing, Seed Snowing / Pesticide	Irrigation After 21 Days, 90mm water required, Weed out	Irrigation Pesticide
Gram		Weed Out	Harvesting	Harvesting							Ploughing Snowing Period	Snowing Period	Weed Out
Masur		Weed Out, Irrigation	Harvesting	Harvesting							Ploughing, Snowing Period	Snowing Period	Weed Out, Irrigation
Mustard			Harvesting	Harvesting							Snowing Period		
Arhar			Harvesting	Harvesting			Ploughing, Snowing Period, Compost	Ploughing, Snowing Period, Compost	Weed out		Weed out		
Maize							Ploughing	Snowing period, Compost	Snowing Period, Compost	Weed Out		Harvesting	Harvesting
Kulthi									Ploughing, Snowing	Weed out		Weed out	Harvesting
Paddy							Ploughing,	Snowing		Weed out	Harvesting	Harvesting	
Till								Snowing			Harvesting		

Water requirements of Rabi crops & Kharif crops

Rabi crops	Total Water requirement in mm	Growing period (NO of days)	Land type required	Fulfil with RF in MM	Deficit in mm
Wheat	500mm	90	Middle land	51.43	448.57
Gram-	400mm	130-135	Middle land	51.43	348.57
Mustard	400mm	90	Middle land	51.43	348.57
Lentil (Masur)	425mm	125-130	Upper land	51.43	373.57

Kharif crops	Total Water requirement in mm	Growing period (NO of days)	Land type required	Fulfil with RF in MM	Deficit in mm
Rice	1250mm	110	Middle land	51.43	1198.57
Maize	525 mm	120	Upper land	51.43	473.57
Arhar	_____	150-200	Upper land		
Kulthi	_____	120	Upper land		

Water Budgeting for Horticulture

Name of crops	Total water requirement in mm	Daily water requirement in mm	Growing period (NO of days)	Land type required	Fulfil with RF in MM	Deficit in mm
Brinjal (Sept-Jan)	486mm	3.24	150	Middle land	51.43	434.57
Pea (Oct-Feb)	440mm	2.93	150	Middle land	51.43	388.57
Chilli (July -Nov)	600 mm	3.33	180	Middle land	51.43	548.57
Potato (Oct -Dec)	400 mm	4.44	90	Middle land	51.43	348.57
Tomato (Oct -Dec)	425 mm	4.72	90	Middle land	51.43	373.57
Cauliflower (Oct-Jan)	400 mm	3.33	120	Middle land	51.43	348.57
Cabbage (Oct-Jan)	400 mm	3.33	120	Middle land	51.43	348.57
Pumpkin						

Month wise water fulfilment through Rain of Rabi Crop

Rabi crops	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Total Irrigation
Wheat	82mm	82mm	82mm							90mm	82mm	82mm	6
Rainfall	4.7mm	10.23mm	16.7mm							19.8mm	4mm	7mm	
Gram										250mm		150mm	2
Rainfall										19.8mm		7mm	
Mustard	100mm									150mm	50mm	100mm	4
Rainfall	4.7mm									19.8mm	4mm	7mm	
Lentil (Masur)										250mm		150mm	2
Rainfall										19.8mm		7mm	

Month wise water fulfilment through Rain of kharif Crop

Kharif crops	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Total Irrigati on
Paddy	—	—		—	—	—	—	—	—	—	—	—	
Rainfall													
Maize	—	—		—	225m m	100m m	—	200m m	—	—	—	—	3
Rainfall					6.83	56.36		169.2					
Arhar	—	—		—	—	—	—	—	—	—	—	—	
Kulthi	—	—		—	—	—	—	—	—	—	—	—	
Til	—	—		—	—	—	200m m	—	200m m	—	—	—	2
Rainfall							256		73.73				

Water budgeting in different ware sources

Water structure	No of Structure	Purpose	Coverage in area
Dam	1	Irrigation/ Fishing	1-2
Pond	6	Irrigation	1-2
Urban nala Bund	6	Soil erosion Irrigation	
Canal			
Nala	2	Pull back to overflow	25-30
Dova	4	Water discharge/ Irrigation	25-30
Hand pump	10 (Community based)	Portable water for Human being and animals/Showering	10-15

Findings

- Only the Mathkhani Dam is the source of surface water for irrigation in the off rainy season
- In case of Horticulture the wells' water is used for irrigation
- Mainly the Rainfed crops are sown as farmers have less facilities to lift the water from the Mathkhani Dam and their well (like solar pump and diesel Pumps)
- Practice of Drip irrigation uses in Horticulture Crops

Conclusions



In my research. The water available in the Mahtani dam is about 14 hectare meter which in Ideal case the water is required about 45 hectare meters is all the empty land is shown, even then if half of the agriculture land is sown even then there would be water deficits So there should be some water body intervention patch wise so that the water can be availed at that very patch. In case of Households water needs and for livestock's the water in the wells is enough but it cannot be denied drying or to deplete the water table, so time to time the wells should be cleaned to avoid siltation. It is also found that the recharge rate is good at the Chuchrumanr so maximum amount of water can be extracted in use other than drinking and livestock's.

Provide a service during covid 19 Pandemic

The COVID-19 Pandemic is turning out to be one of the biggest disasters of our time, threatening to have a long-term impact in the social –economic conditions of the rural community. In Jharkhand the health-related implications of those corona virus were realized at a much later phase. But the resulting effect of lockdown had an unimaginable impact in the lives and livelihood of the rural masses, especially to the wages earn and small and marginal farmers.

Vikash Sahyog Kendra It is an NGO which works with the Poor family in Manika, Paaki block in Palamu district Jharkhand. And on employment, rights and promotion of organic farms. Manika block works with 42 Village of 8 Panchayats promotion of organic farms with the under-privilege family. Right now, many poor families are not getting employment due to COVID-19 epidemic in the country, due to which the poor families of the village are facing hunger. Vikash Sahyog Kendra Take step and distribute dry ration support by BRLF. We are select 500HH in 8 villages ST, SC helpless families in their area and provide free dry rationed by their workers, the helpless family was selected according to the following criteria which are as follows –

Disabled, Widow, Single woman / man, for a long time, suffering from disease, marginal workers, workers trapped in migration. During the ration distribution, all the beneficiaries were sanitized, keeping the nose and mouth covered and social distance was distributed by making 1 meter. During delivery, 3 photographs were taken to the beneficiaries (1) while getting sanitized (2) taking material (3) Half photo for documentation. During the distribution, the beneficiaries were informed orally for awareness of avoiding COVID-19, along with the ICE material, for vigilance in the village. Due to the COVID-19 epidemic, the helpless family has been distributed in collaboration with the India Institute of Rural Livelihoods.

Material are these

Serial no	materials	Quantity in Kg
1	Rice	8
2	Lentil	1.5
3	Potato	3
4	Mustard Oil	500 gm
5	Specie	400gm
6	Soap	4 paces
7	Gaggery	1
8	Sanitary Pad	2
9	Wheat Flour	3
10	Gram	1

Thank you