

**SUMMAR TRAINING
AT

**Integrated Watershed Management Projects
&
Its evaluation strategy
At Aanadpur Block of West Singhbhum districts, Jharkhand****

From Date (10th June to 11 16th July)

Internship Report Submitted to



Institute of Health Management Research, Jaipur

The IIHMR University, Jaipur
for the partial fulfilment for the award of the degree
of Master of Business Administration (MBA)

in

Rural Management

by

AVINASH GAURAV

Under the Supervision and Guidance of

Dr. Goutam Sadhu
Professor

School of development studies

Batch (2020 -2022)

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SUMMAR TRAINING INTERSHIP

I hereby declare that this dissertation “A study to examine that how to implement Watershed program in rural area admitted at **WAASAN ORGANISTION** in **Anandpur Block of West Singbhum district JHARKHAND**” is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree . Information derived from the published or unpublished work of others has been duly acknowledged in

AVINASH GAURAV
Place – Jaipur (Rajasthan)
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SIGNATURE

ACKNOWLEDGEMENT

It gives me immense pleasure to share my gratifying and enriching experience to complete this project. However, it would not have been possible without the kind support of many individuals. I would like to extend my sincere thanks not only to my teachers but also to the technical staff to guide me with their expert advice. **Their support provided me with strength and courage during the most difficult times in these Global COVID -19 Pandemics. .**

My sincerest thanks go to all the parents for their support and trust, and to all the **WATERSHED** experts of wassan organization **Mr. Satheesh Kumar, Mr. Kunal Kumar and Mr. Om prakash** and other members of wassan who gave their continuous support and time to follow up on the progress of my study. Without their generosity, this study would not have been possible, and I will never forget the kindness and warmth of all the participants.

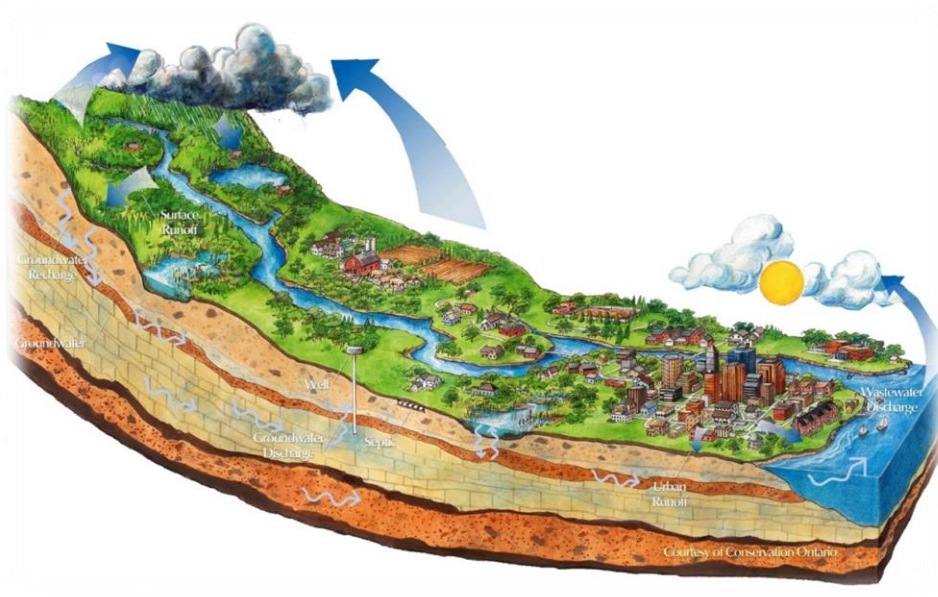
I am very grateful to IIHMR UNIVERSITY Dean ,of School of Development Studies Professor **Rahul Ghai** and our Mentor **Dr. Goutam Sadhu** , my guide for their guidance, encouragement, compassion, support, and belief in me is what kept me going and have given me much needed strength to keep me going. His practicality, constant encouragement and advice helped me in all stages of the project. His scientific views and approach were always a source of motivation for me as well as for providing necessary information regarding the project.

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I owe more than I can express to my parents and friends for local support during filed work (**Shushant Tirkey, Jaleesh Tirkey**). Their endless sacrifices, support, encouragement, and understanding have helped me become a better person. Their boundless love and support have always been a source of inspiration for me.

I take this opportunity to express my profound gratitude to all for being the part of this journey.

WHAT IS WATERSHED



What we think that ?

Watershed development is **NOT ABOUT** :-

- Just Ridge to valley treatment
- Just about structure
- About recharge

But what is watershed ?

Watershed **development is about**:-

- Mobilising and organising community for collective action .
- Regenerating natural resources
- Sustainable and effective use of the natural resources
- Improving livelihood of poor in particular

The definition of Watershed management ?

Integrated watershed management is the process of managing human activities and to manage natural resources on a , taking into account of **social, economic and environmental issues**, as well as **local community interests** and **issues such as the impacts of growth and climate change**. is known as watershed Management



Building Capacities

**Enabling People,
Enriching Programs and Policies**

Summary

Being an MBA student of Rural management background, my internship with **WASSAN** organization on **INTEGRATED WATERSHED MANAGEMENT PROJECT** yielded me a vast range of exposure and learning hence inducing approaches to implement theories to ground realities.

It's important to capturing scarce water resources and improving the management of soil and vegetation, watershed development has the potential to create conditions conducive to higher agricultural productivity that's will help conserving natural resources. Being an intern at WASSAN ,which works as a **WATERSHED DEVELOPMENT ORGANIZATION** for some of district Integrated watershed management projects on Jharkhand districts I cherished the opportunity to understand the working and base line of projects, to realize its importance in development of community and its contribution towards conservation of natural resources , poverty alleviation and overall nurture of villages.

This report is a concise thesis of my internship including details of activities in which I was involved, my perspective towards the process of work along with the details of organization I was involved with. I have tried my best to incorporate my individual and independent view point.

This report puts forward a critical analysis of integrated watershed management programme being carried in Anadpur block of west Singhbhum districts in Jharkhand .It further deals with the strategies involved in evaluation and monitoring of watershed projects to forward a comparative study. Moreover in parallel with above study of socio-economic structure has also been incorporated for further understanding of subject

Secondly, the report tries to analyse the strategies required to be adapted to understand the effectiveness of various watershed projects .An imperative approach to include economic and financial analysis of project has also been discussed. During these two months remained confined in districts of **WEST SINGHBHUM of JHARKHAND**. Data and observations used in study have been taken from watersheds of these areas

This report briefs its summary with a view point that organizations like WASSAN should been courage by people and government for its immense effort towards betterment of society.

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ABBREVIATION

WASSAN	Watershed Support Service and Activities Network
NRE	National Rural Employment Act 2005
MGNREGA	Mahtama Ghandhi Employment Guarantee Act 2005
PIA	Project Implementing Agency
CSOs	Civil Society Organization
PRA	Participatory Rural Appraisal
BRLF	Bharat Rural Livelihood Foundation
JJK	Jan Jagran Kendra
SUPPORT	Society For Upliftment of People with People's Organization

Chapter 1

Internship Details

This chapter precisely elucidates the details of organization, activities in which I was majorly involved and the observations garnered during internship period.

The Organization



The **WASSAN** Group of Institutions consisting of **WASSAN (Watershed Support Service and Activities Network, registered as a Charitable Trust)**

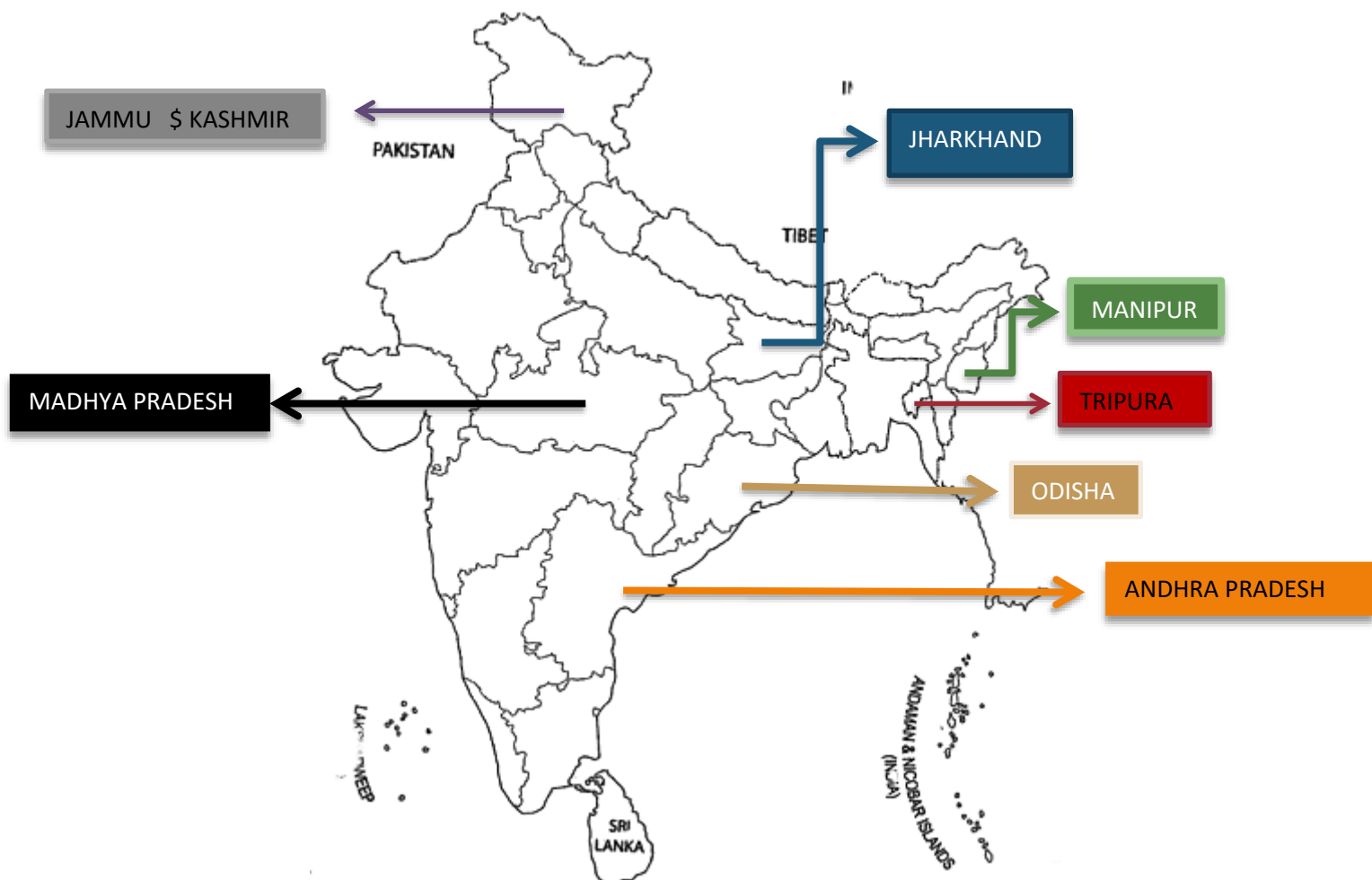
This organization founded in 1995 and this Foundation was (Registered as Not for Profit Company under the Section of 25C), Hyderabad

This organization is a group of national level support and resource organizations for improving the livelihood of villager.

The organization has incorporated more and more partners to promote participatory initiatives and enhancing capacity building. Major steps include working with community-based organizations since 2003, partnership with Mandal Mahila Samakhya to promote learning on larger grounds. In the year 2004 working with NRM based cooperatives and Panchayat Raj institutions also studying on wage issues in partnership with Agriculture Labour Unions.

The organization working in many several states under government partnership for the development of rural area and improving the livelihood of the villager's thorough development.

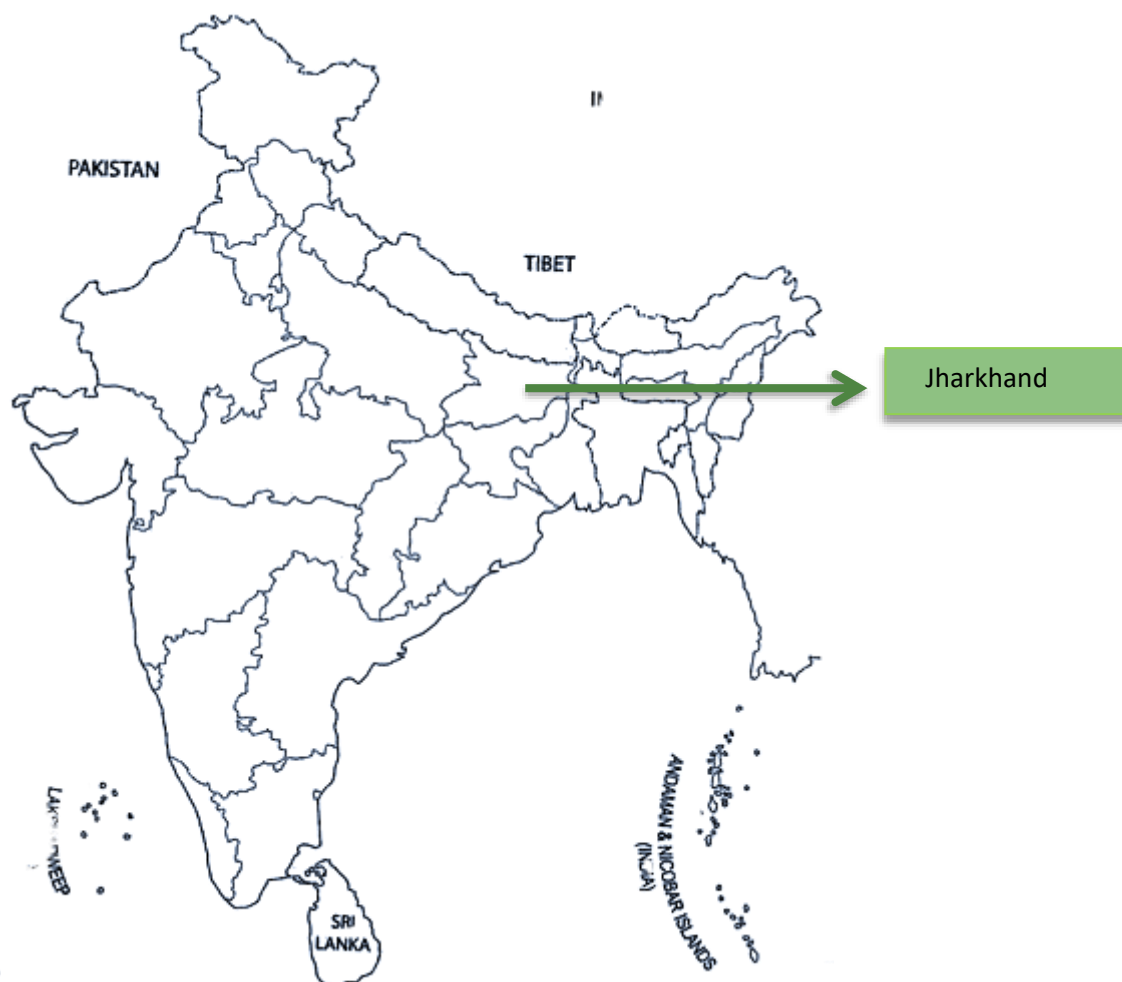
Project map



Map 1.1

WASSAN Group of Institutions is working with under several state governments' partnership

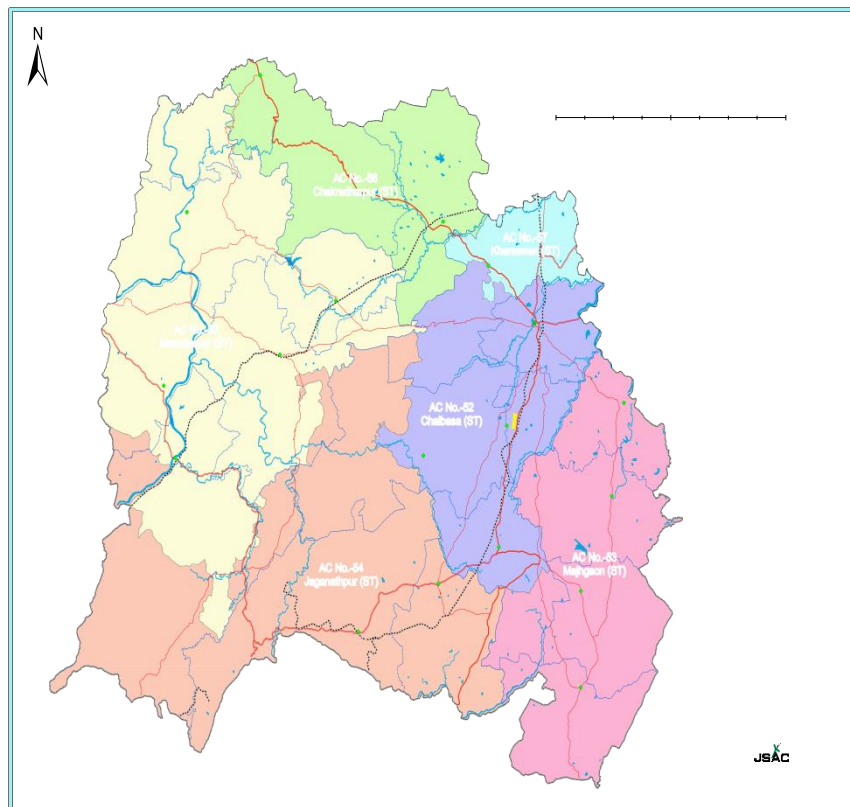
Study Area



Map 1.2

Study area and the map of Jharkhand

District map



Map -2.3

District map of West Singhbhum , Jharkhand

Chapter 2

INTRODUCTION

Background of study



During my 40 working days internship with **WASSAN**, I have attempted to absorb as much of learning as possible. Some of the learning objectives that I relished within this period are

- ✓ Understanding the working strategy of a non-governmental organization.
- ✓ Understanding and realization of work ethics in a professional environment.
- ✓ Analysis of field visits and proposal of elements to strengthen the work strategy.
- ✓ Adaptation to a completely new social interface.

I was involved with integrated watershed development projects and its evaluation and monitoring and learning to ensure the proper implementation of Watershed programme to enhance social, economical and technological bio-data of watersheds.

This is the **West Singhbhum districts of Jharkhand** most of area come under rainfed areas. The **WATERSHED SUPPORT SERVICES AND ACTIVITIES NETWORK (WASSAN)** has been working in this district's January 2021, keeping in mind the need to give a special thrust to rainfed areas. A close analysis of various types of rainfed situations reveals that soil land water conservation, watershed development and efficient water management are the key to sustainable development of rainfed areas. The watershed approach has been accepted as a major theme for development of rainfed areas with a view to conserving natural resources of water, soil and vegetation by mobilizing social capital.

In order to assess the performance of various on-going projects / programmes of watershed development, a series of evaluation studies have been conducted by various agencies or project partnerships are -

Project partnership of WASSAN

GRAM PANCHAYAT

Project Implementing

Agency (PIA)

WOMEN SHG AND THEIR COLLECTIVES

**Mobilisation, Planning for livelihood
enhancement**

SUPPORTED BY CIVIL SOCIETY ORGANISATIONS (CSOs)

Extended facilitation support to Gram Panchayat – community mobilization, capacity building, DPR preparation and technical support for field level implementation.

BLOCK AND COORDINATION COMMITTEES

Inclusion of participatory plans in MGNREGS and ensuring their implementation and Convergence of various Departments.

COMMISSIONER OF MGNREGA / DEPARTMENT OF RURAL DEVELOPMENT

**Policy Development , Review and Monitoring of Outputs and problem Solving and
Liaison With District Administration**

STATE PROJECT MANAGEMENT UNIT (SPMU)

**Project Management and Capacity building, Liaison with District Administration,
Coordination with MGNREGA cell**

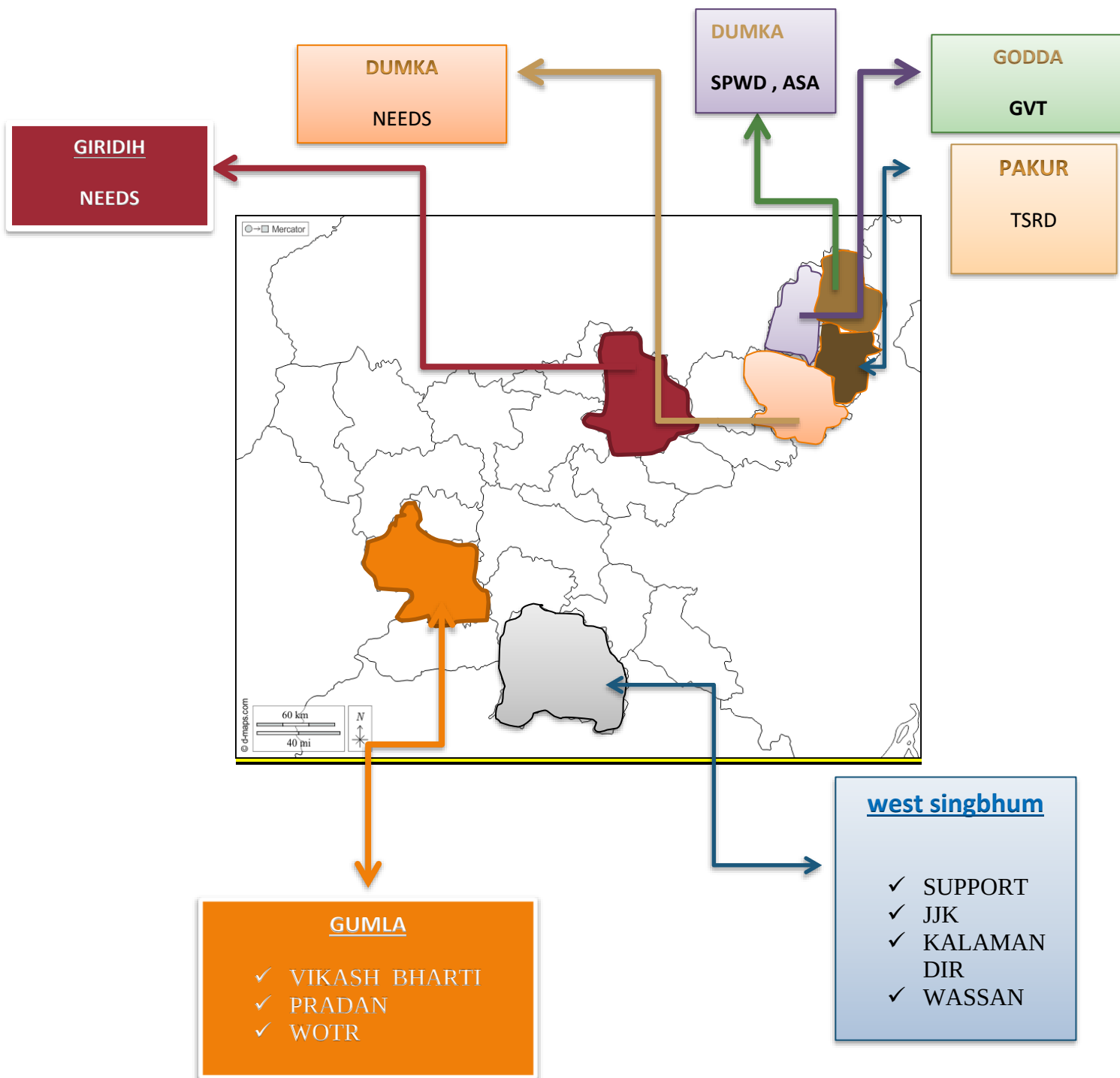
BRLF AND WHH

Funding's support, Project Monitoring with CSOs

Hence in coordination with the WASSAN, an initiative has been taken to formulate **“Common Guidelines for Watershed Development Projects”** in order to have a unified perspective by all area. Common Guidelines lay strong emphasis on MELD (Monitoring, Evaluation, and Learning & Documentation) as a programme policy with separate financial Provision which under MGNREGA.

I as an intern visited watersheds one of large districts of Jharkhand **West Singhbhum Aandpur block TUTILDIH village** for the purpose of evaluation and monitoring. Though there has been criticism on working strategy of NGOs taking land paper for programme contributing a vital and crucial role in Jharkhand watershed development projects. As an intern I have realized that there lies an immense scope of learning to imitation working with WASSAN.

PROJECT MAP



Research Methodology -

As per the guidelines, WASSAN is required to do concurrent monitoring of each and every watersheds and a final report is drafted for watersheds of each and every Submitted ODK .taken by CSO report is submitted to **WASSAN office in ANANDPUR** .

Watershed Development team, the level monitoring crosschecks watershed works in the specified village . There are 8 to 9 villages at an average in each and monitoring checks the status of each and every component of watershed programme implemented .This monitoring is a mean reflection of work being carried in all those villages coming under the **ANADPUR BLOCK, WEST SINGHBHUM DISTRICTS** and . Concurrent monitoring crosschecks the stage to which entry point activities have reached , they are completed or are under completion , detailed project report has been prepared or not ,**status of livelihood action plan ,status of user group formation , weekly meetings on zoom meeting ,trainings ,functioning of programme and execution of Natural Resource Management and watershed or maintain the ground water level .**

At Works .Each and every component mentioned above are checked in details .As part of monitoring team I was given very right to ask for any **relevant documents , proof of any MGNREGS JOB CARD or LAND PAPER , registers , pass books etc.** In one sample village CSO monitoring is carried on the same mentioned parameters to reflect the correlation between the progresses in a given village compared to total progress. I was **the part of** concurrent monitoring team for JUNE 10th 2021 monitoring **TUTILDIH village of ANANDPUR BLOCK** . While the final monitoring report of WASSAN was managed **FROM OFFICE AT ANANDPUR**.

How watershed programme implementation, this is the step flow during programme implementation are -

- ✓ **First** select area for the watershed programme where implement
- ✓ **Second** do survey of the area where programme implement and help of the head of the village ex- Gram Panchayaat member mukiya or local community member of the village.
- ✓ **Third** conduct PRA and ask for the time from Mukhiya and place where conduct PRA
- ✓ **Forth** during PRA explain about the watershed, and it positive factor how can its will change livelihood of the village after project implement and about work
- ✓ **Five** do document verification of the land and visit to filed survey
- ✓ **At last fifth** do land measurement for the watershed model which implement

List of document

1. Khatiyaan paper of the land
2. Land paper
3. Job card of MGNREGA
4. Adhaar card
5. Ration card
6. Bank passbook

valuation schedule comprises of three stages:

- ✓ Interaction with **PRA** to explain strategy and need for evaluation.
- ✓ Visiting with watershed expert in villages for verification of all documents, pass books, registers MENREGS job card ,land papers etc.
- ✓ Visiting field to cross check proper location and functioning of EPA works, cross check of all structures, its design and specifications.

While the first two stage requires a socio-economic mindset to handle meetings .final stage requires in depth knowledge of **desinge structures like continuous contour trenching, contour bunds, terracing etc .**

Chapter 3

MGNREGA AND WATERSHED DEVELOPMENT

Category A (Public Work related to NRM)

- (i) Water conservation and water harvesting
- (ii) Watershed Management
- (iv) Renovation of traditional water bodies
- (vi) Land development works in common land

Category B (Community or individual assets)

- (vii) Improving productivity of household land
- (viii) Plantation
- (ix) Development of fallow/ waste land

UNDERSTANDING WATERSHED

- ✓ Ridge line (RL)- line joining top of watershed from where slope starts
- ✓ Catchment area (CA)- area from where river catches water
- ✓ Ridge area (RA) Area from ridge to where the plain starts
- ✓ Drainage line (DL) main channels of rain water forms.
- ✓ Contour Line – imaginary line that joins points of same height
- ✓ Horizontal Interval
- ✓ Vertical Interval
- ✓ $\text{Slope} = \frac{\text{vertical interval}}{\text{horizontal interval}} \times 100$



Fig 1.1 - Ridge line



Fig 1.2- slope vertical and horizontal interval

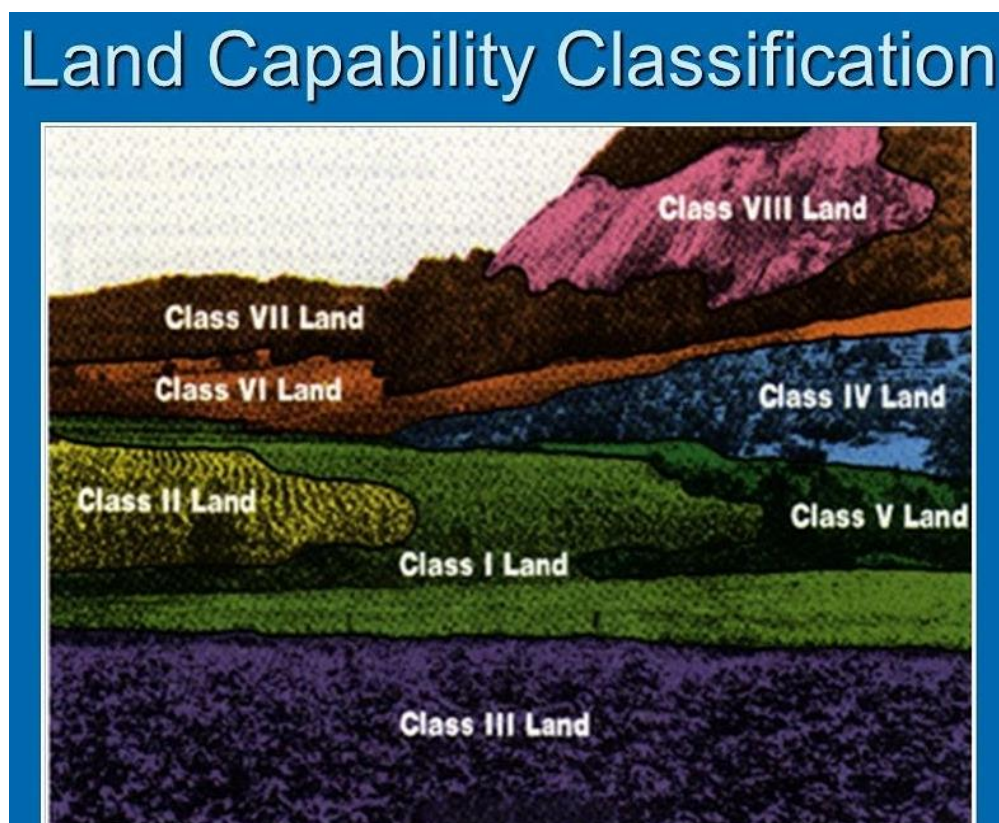
CATEGORIZATION OF LAND ACCORDING TO SLOPE

LAND CAPABILITY CLASSIFICATION

- Basic principle of Soil and water conservation is to use the land according to its capability and treat the land according to its needs for
- LUCC - systematic grouping of different kinds of land for sustained productivity

Factors determine the land capability

- ✓ Soil types
 - ✓ Slope and thickness of soil
 - ✓ Climate
 - ✓ Rainfall
 - ✓ Soil erosion, water logging, flood and drought
- LCC is important for planning, implementation of soil and water conservation programs
 - This classification system categorises the whole land into eight classes.
 - a. **Class I to IV are suitable for cultivation**
 - b. **Class V to VIII are unsuitable for cultivation**
 - Land use capability classification was developed by the United State Department of Soil Conservation Service



LAND CLASSIFICATION FROM CLASS 1 TO CLASS VIII

Class-I (0-1% slope)

- Very good land
- Nearly level and no risk of erosion
- Deep soil depth, well drained, easily workable,
- Water holding capacity is also good
- Suitable for intensive cultivation and all crops
- Crop rotation is required to maintain soil fertility and soil structure

Class-II (1-3% slope)

- Good land
- gentle slope, moderate erosion;
- moderate soil depth and soil fertility
- occasional damaging overflow
- Soils require careful management like crop rotation, green manure contour Cultivation, disposal of excess water
- Moderate attention to conservation practices

Class-III (3-5% slope)

- Moderately steep slope, shallow soil
- Severe erosion,
- Poor sandy, gravelly, clay soils
- Low moisture capability,
- Low inherent fertility, very slow permeability
- Must be given conservation practices- contour bunding, long crop rotation
- Crops must be carefully selected

Class-IV (5-10% slope)

- Slope is steep
- subject to severe erosion
- soil is rich in fertility
- shallow soil,
- Hilly lands and lowest preference for cultivation
- low moisture-holding capacity
- Suitable for occasional or limited cultivation
- Special conservation management practices
- Engineering measures are recommended

Class-V (15-25% slope)

- Almost same characteristics of class-1 (limitation is stoniness, slope)
- Unsuitable for cultivation
- Cultivation is not possible because of one or more limitations, i.e. overflow, stoniness & wetness
- Soils have little or no erosion hazard
- Soils are used mainly for pastures, forests, wildlife food and cover
- Pastures can be improved

Class-VI (25-33% slope)

- Steep slope
- Stoniness
- Low moisture holding capacity
- Shallow root-zone
- Excessive wetness or overflow
- Suitable for horticulture crops like Mango, Guava, cashew

Class-VII (33-50% slope)

- Highly unsuitable for cultivation
- Lands are very shallow, very steep slope
- Rough, stony or severely eroded.
- Suitable for Grazing and forestry
- Severe restrictions for use and extreme care.

Class-VIII (above 50% slope)

- Barren lands
- Not suitable for cultivation pasture development, grazing
- Only suitable for wildlife



watershed management slope is very important to understand because slope gives the information about the watershed topography. it is considered an independent variable

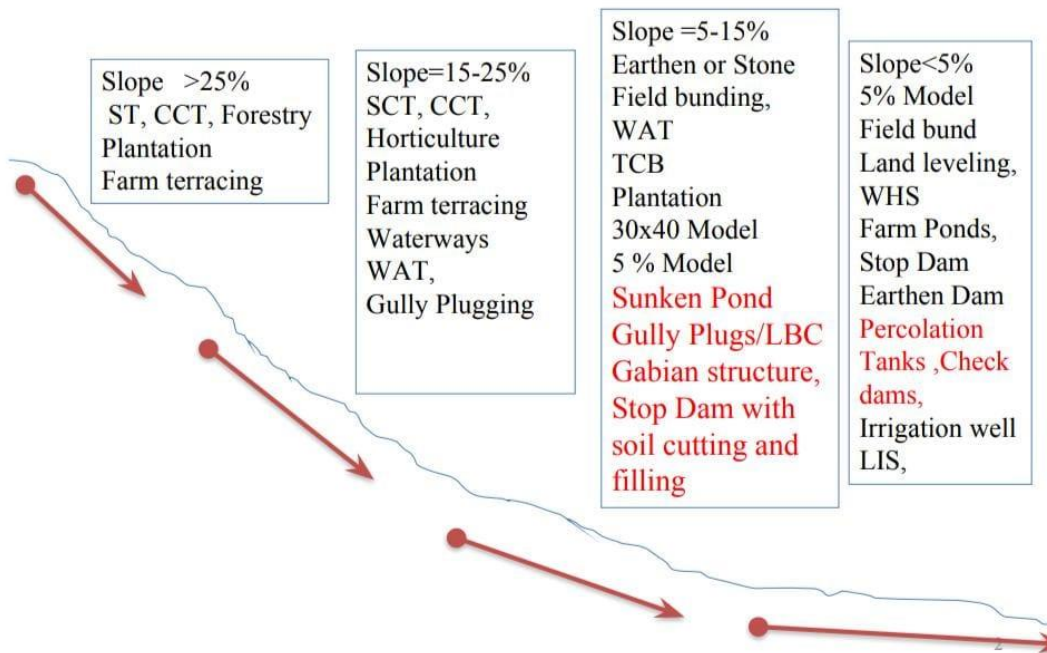


The average slope of a watershed influences radically the value of time of concentration and directly the runoff generated by a rainfall

HOW TO MEASURE SLOPE

- By using pipe to check level of pipe
- By using dumpy level or auto level
- By using gps (global positioning system
- Google earth pro software
- Total station

These are the watershed model according to slope;



Watershed model

- ✓ Ridge area treatment
- ✓ Continuous contour Trench
- ✓ Staggered contour Trench
- ✓ Water Absorption Trench
- ✓ 30 x40 model with plantation
- ✓ 30x40 model
- ✓ Stone Bunding
- ✓ Field Bunding
- ✓ 5% model (low land fram pond)
- ✓ Fram pound /Dhoba
- ✓

AREA TREATMENT



- Slope 10-25%
- Size 16' 4" X 1'8" X 1'8"
- Barm Space:- 20 CM
- Valume of earthwork
- 54 cft or 1 Chowka
- (Hard Soil)

FIG 1.3 - CONTINUOUS CONTOUR TRENCH



- Slope 10-20%
- Dimension
- 9'10" X 1'8" X 1'8"
- Barm Space:- 20 CM
- Cost:- 65500/Acre
- Man Days :- 372
- Labour :- 94.37%
- Material :- 5.63%

FIG 1.4 - STAGGERED CONTOUR TRENCH



- Slop : 3 - 8%
- 30' along the slope
- 40' across the slope
- Pit at lowest point
- 7' X 7' X 3' top
- 5' X 5' X 3' bottom
- Bund 1*2
- Cost:- 35965/ha for 90 Peice
- Man Days :- 208
- Labour :- 94.67%
- Material :- 5.33%

FIG 1.5 -30 X 40 MODEL

30 X 40 MODELS WITH MANGO PLANTATION



FIG 1.6 MONGO PLANTATION WITH 30 X 40



- Medium upland
- 1/5 of length
- 1/4 of width
- 5-7' deep
- December to June ,during rainy session.

FIG 1.6 -5% MODEL
(LOCAL NAMES:- HAPPA, DOBHA, BAWLI)



- Lenth :- 500 ft
- Top Width 4'
- Bottom Width 3 ft
- Depth 3 ft
- Estimated Cost
- 18977/-
- Man Days :- 104
- Labour :- 92.69%
- Material :- 7.31%

FIG 1.7 KUTCHA CANAL 500 FT



- Site :- Medium Low Land
- Size:- 50' X 50' X 10'
- Slope :- 2 : 2
- Estimated Cost
- 59,538/-
- Man Days :- 349
- Labour :- 94.60%
- Material :- 5.40%

FIG 1.8 -FARM POND (50' X 50' X 10')

FARM BUNDING

<3% slope

1 ha generates 210 man days

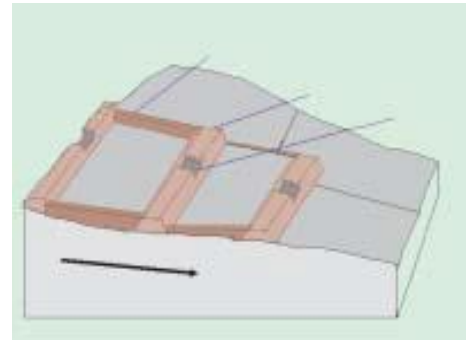
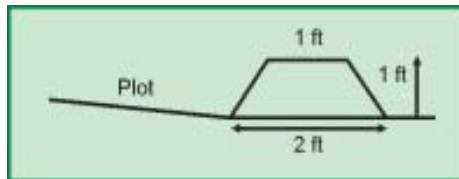


FIG 1.9 CALCULATION OF FARM BUNDING

DRAINAGE LINE TREATMENT



Purpose of Drainage line Treatment

The main objective of the drainage line treatment in watershed is very important because this treatment is measure is to reduce the velocity of flowing water and the drainage line treatment is primarily done by the construction **Gully and Plugs or Check dam.**

Drainage line Treatment and having its Benefits and Limitation –

TABLE 1.1 These are the some benefits and limitation of drainage line Treatment

S.no	Benefits	limitation
1	Reduces erosion and prevents unwanted gully formation during a flood	It's will can spilt up and will need maintenance
2	Allow groundwater recharge and sediment to settle out (reduce sediment transport)	The level of infiltration can be slowed due to silt build – up
3	This is the cost effective - these measure can use locally available materials like stone ,sand etc.	
4	This can assist recharge of shallow wells.	
5	The trapping silt reduces siltation of bigger structure downstream	
6	Most important to increase the duration of flow	

What are Gullies ?

Gullies are formed when erosion of the soil along drainage lines by surface water runoff and it turn into gullies and will continue to move towards upstream side (opposite to the direction of flow and there are measures are taken to stabilize the disturbance. And This way gullies formed.

Principals of drainage line treatment measure

- Stop dams
- Earthen dam or Earthen check dams
- Underground (subsurface)
- Organic Gabion Structures
- Loose Boulder Check Dams
- Bori Bandhan or Katta Crate and sand bag Dams
- Weirs

High Embankment Balance between catchment and storage capacity –



FIG 1.10 - High Embankment Balance between catchment and storage capacity.

Summery Sheet of Different Schemes under NREGA Of Watershed model

TABLE 1.2

SI No.	Item and Brief Details of structures	Estimated cost (Wage Rate 158)	Total Estimated Mandays	% of Labour & Material Cost	
				Labour cost (%)	Material Cost (%)
1	ESTIMATED FOR COST FOR CATTLE PROOF TRENCH Lenth 500' X Avg. width 3.5' X Depth 3' (Top Width 5' & Bottom width 2')	19767.00	109.00	93.00	7.00
2	ESTIMATED COST FOR Water Harvesting Pond Size 30' X 30' X 10' (slop 2 ft : 2 ft)	17343.00	96.00	94.25	5.75
3	ESTIMATED COST FOR Water Harvesting Pond Size 35' X 35' X 10' (slop 2 ft : 2 ft)	25455.00	145.00	94.65	5.35
4	ESTIMATED COST FOR Water Harvesting Pond Size 40' X 40' X 10' (slop 2 ft : 2 ft)	35175.00	203.00	94.54	5.46
5	ESTIMATED COST FOR Water Harvesting Pond Size 50' X 50' X 10' (slop 2 ft : 2 ft)	59538.00	349.00	94.60	5.40
6	ESTIMATED COST FOR Water Harvesting Pond Size 60' X 60' X 10' (slop 2 ft : 2 ft)	91343.00	537.00	94.44	5.56
7	ESTIMATED COST FOR Water Harvesting Pond Size 100' X 100' X 10' (slop 2 ft : 2 ft)	277642.00	1688.00	97.23	2.77
8	ESTIMATED Cost FOR FIELD BUNDING (Two Sides) for Plot Size of 100 Decimal (1 Acre) 43560sq ft. Lenth 209 ft. Breadth 209 ft.	10615.00	55.00	90.38	9.62
9	ESTIMATEd Cost OF GULLY PLUGGING (Boulder Check) Gully Interval (HI)= 67 ft, Upper Width=2 ft,Hieght= 3.28 ft. U/ S slop= 1:1, D/S slop=1:3	30861.00	78.00	40.00	60.00
10	ESTIMATEG COST FOR KUTCHA CANAL Lenth 500' X Avg. width 3.5' X Depth 3' (Top Width 4' & Bottom width 3')	18977.00	104.00	92.69	7.31
11	DETAILED MODEL ESTIMATE FOR LAND LEVELLING, AREA 50 Decimal=21780 sft (3%slope), Lenth 104 ft. Breadth 104 ft.	25853.00	144.00	92.48	7.52
12	Estimate Cost of Loose boulder structure Lenth 33 ft, Top Widh 2' ft, Hieght 3.28 ft, Bottum Width 15' U/S Slop 1:1 & D/S slop 1:3	50600.00	129.00	40.32	59.68

Chapter 4

WATERSHED DELINEATION

The watershed delineation method is the very important to understand because it will very helpful for the watershed mode; or its implementation Watershed delineation is the process of identifying the drainage area of a point Orset of point .

- Toposheet which helps to understand geographical understanding of drainage, settlement ,forest area, etc.
- Its helps to know water flows in the Direction of the terrain steepest downhill slope.
- Its help to Identify the elevation contour line in toposheet map
- the river streamline do not flow towards drainage divides and do not intersect them
- the drainage divides are found along the highest points of the terrain

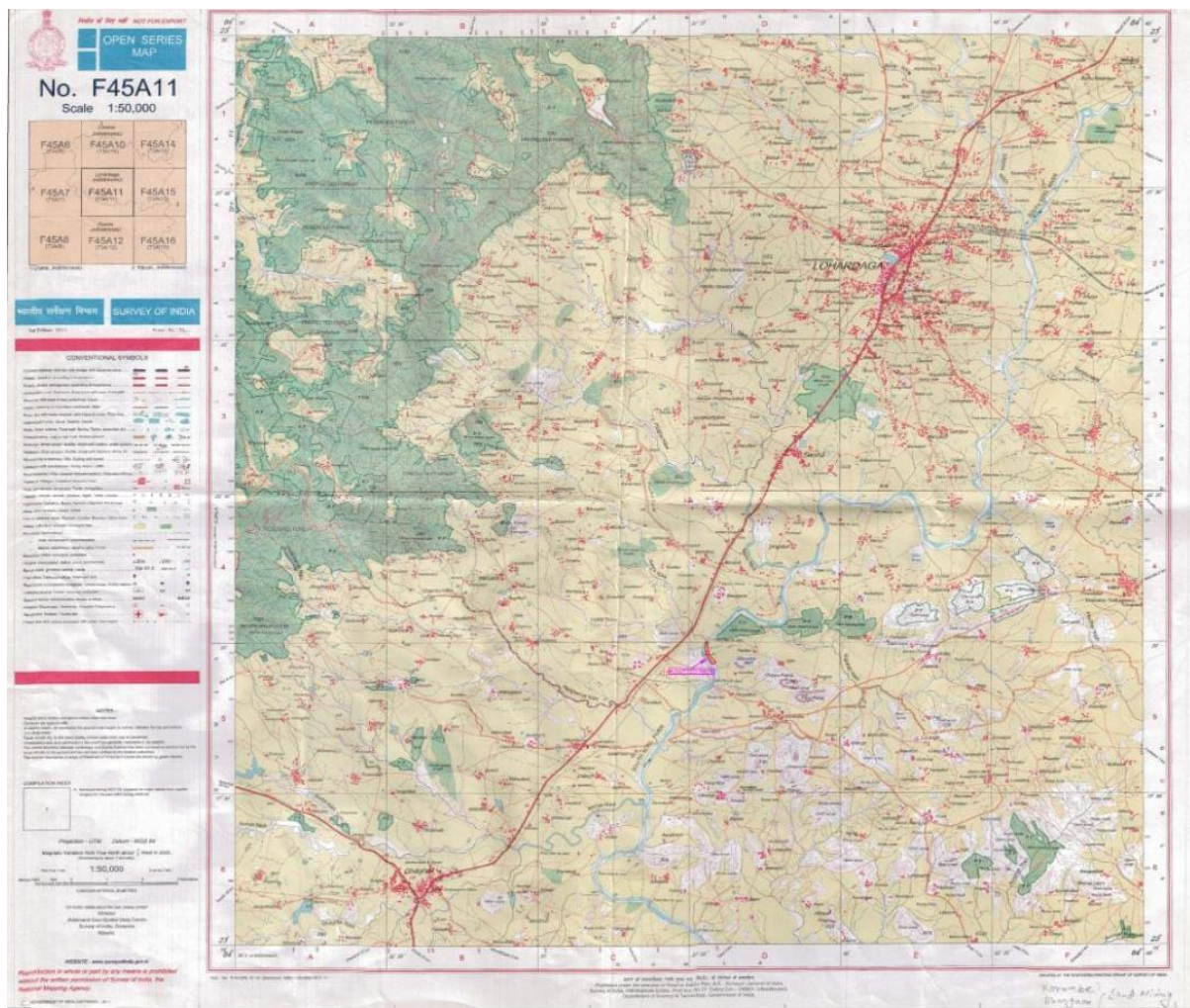


FIG 1.10 - TOPOSHEET MAP

how to identify drainage line

1. Delineate watershed from Topo sheet given
2. Find Stream order, area of watershed, stream length and stream number of the delineate watershed.
3. Calculate Bifurcation ratio , Drainage density, Stream Frequency

Watershed Delineation

Clipped Watershed boundary with streams



Watershed boundary on toposheet



Clipped Watershed boundary with streams

Red colour : Stream 1 (Number 4)
Orange colour: Stream 2 (1 Number)

Stream wise length

Stream 1 :: Features Total: 4, Filtered: 4,

	id	length
1	1	580
2	1	533
3	1	349
4	1	795

Total Length in Meter
2257

Stream 2 :: Features Total: 1, Filtered: 1, !

	id	length
1	2	269

Total Length in Meter
269

Drainage Analysis

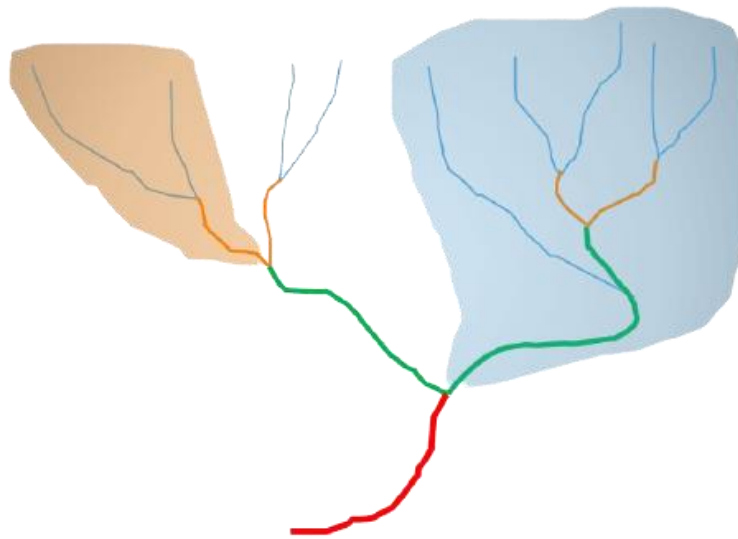
Stream order	Total no of streams each order	Total length of streams of each order in KM	Water shed AREA (Sq.Km.)	BIFURCATION RATIO	Drainage density (Km/Sq. Km.)	Stream frequency (Sq. Km.)
1	2	3	4	5	6	7
1	4	2.257	1	4 (MD)	2.526 Moderate infiltration	5 (Moderate runoff)
2	1	0.269				
3	0					
4						
5						
6						
7						
TOTAL						

TABLE 1.3 - DRAINAGE ANALYSIS OF RIVER STREAM

The key features of Watershed

A watershed area and the water volume of water that drains from its directly depend upon the size and which flow of the primary stream of the water body and other factor which involved That make each watershed distinctive include **its mosaic of land uses and soil types geology ,topography and climate.**

WATERSHED STREAM ORDERING



1	STREAM 1
2	STREAM 2
3	STREAM 3
4	STREAM 4

Chapter 5

Internship Report

Concern about widespread soil degradation and scarce, poorly managed water resources has led to the spread of watershed management investments throughout **ANANDPUR BLOCK of West Singhbhum District's in Jharkhand**. Despite the growing importance of watershed projects as an approach to rural development and natural resource management, to date there has been relatively little research on their impact

It is vital to note that due to social and technological complexity of watershed projects managing a proper and most fit evaluation strategy has become a difficult task. Evaluations usually take either a quantitative or qualitative approach, with the two approaches often viewed as alternatives. Evaluation strategy has been more inclined towards qualitative one. Quantitative evaluation uses statistical analysis to disentangle project effects from intervening factors. Qualitative evaluation however tends to make certain assumption about how a project affects individual behaviour.

A watershed is an area from which all water drains to a common point making it attractive unit for technical efforts to manage water and soil resources for production and conservation. From a hydrological perspective a watershed is **a useful unit of operation and analysis because it facilitates a systems approach to land and water use in interconnected upstream and downstream areas. In dry land areas such as the Indian semi-arid tropics, watershed projects aim to maximize the quantity of water available for crops, livestock and human consumption through on-site soil and moisture conservation, infiltration into aquifers, and safe runoff into surface ponds.** In catchment areas of dams, ponds, river stream, watershed projects typically focus on minimizing soil erosion that deposits sediment into reservoirs and to the maintenance of base flow.

Larger part of ANANDPUR BLOCK lies in rain fed regions. Water availability is a major issue of concern. Situations are so intense that just a week delayed monsoon in a given year. The agro-climatic conditions of this districts because availability of water whole water goes down part of the area I visited during my intern do have the same story, however when rain comes water flowed down the area gets an edge in water availability due to presence of several ponds name called **RAJA TALAB** is biggest one ponds in the area and smallest ponds name called **RANI TALAB**, The area depened upon this ponds water for doing small agriculture practice.

Project Implementation

- project implementation Agency –WASSAN
- Initiation of capacity building Phase -2021 January
- Initiation of final implementation phase -2021 after survey of the village
- Completion of watershed project -2024
- Total budgetary outlay under MNREGA

225 MNREGA PAYMENTS PER DAY X 200 MNREGA HOLDERS OF JOB CAR

225 X 200 = 57375 IN A DAY

45000 X 30 =1,350,000

1,350.000 average amount

Intervention process

Capacity building phase

- Reconnaissance survey
- Initiating social mobilization
- To Organize women SHGs
- Trough Gram panchayat
- Formation of hamlet level watershed committees
- Promotion of apex level watershed association
- Exposure to ANANDPUR BLOCK
- Visioning exercise
- The Entry point Activities and preparation for planning

Full Programme implementation

- Training of watershed committee members on ;
 - To layout the technical design and the layout
 - To do measurement and work and the payment
 - To make a maintenance of books of account
- To do Training of villager people to about watershed model and the do and adopt the watershed model to improved technology for productivity enhancement.
- To do a Training of watershed Community on maintenance of assets

RESERCH QUSTION

What is caused of low level of ground water and what do understand about watershed, and how to conserve water at last how maintain moisture on soil ?

RESEARCH OBJECTIVE

- Focus on most of deprived and resource poor geographical of Jharkhand
- Strengthen capacities of Gram Panchayats in planning and impanation of MGNRES
- Mobilising communities for visioning participatory planning and collective action
- Building upon the strengths of community institutions
- Comprehensive treatment of watershed for sustained impact
- Revival of agro –ecology
- Effective plan based convergence
- Effective plan based convergence for enhancing livelihood
- Quality of the ground water for drinking

PLANE OF ANALYSIS

valuation schedule comprises of three stages:

- ✓ Interaction with **PRA** to explain strategy and need for evaluation.
- ✓ Visiting with watershed expert in villages for verification of all documents, pass books, registers MENREGS job card ,land papers etc.
- ✓ Visiting field to cross check proper location and functioning of EPA works, cross check of all structures, its design and specifications.

While the first two stage requires a socio-economic mindset to handle meetings .final stage requires in depth knowledge of **desinge structures like continuous contour trenching, contour bunds, terracing etc .**

Evaluation of NGOs to cross check suitability to work as project implementation agency for Integrated watershed projects

In 2ND DAY of internship I was mostly involved with evaluation of NGOs and watershed expert and taking picture .As per their application for project implementation agency for integrated watershed management projects , **I along with my team visited TUTILDIH viilage in Anandpur Block** , and we started evaluation used to be availability of technical staffs in our watershed expert team ,and its experience in watershed works and Natural Resource Management activities , asking for reports and inferences based on availability of assets and infrastructure in the organization.

Data analysis of watershed project's Impact evaluation of ANANDPUR BLOCK of west singhthum district;-

Impact analysis of Integrated watershed management project in west Singhthum district at Anandpur block .we collected As the door to door house hold survey of impact analysis of Integrated watershed management project was completed .I prepared the total data sheet on excel representing BEFORE PROJECT ,AFTER PROJECT & PRESENT STATUS of agriculture in each and every villages .More over a net realization of profit for each and every house hold was also calculated formore than 200 households .

How to implement watershed programme

1. Select area where watershed programme implemented .
2. Do survey of the area
3. Then go to head of the village Gram Panchayat and share whom you are and about watershed project and how its will benefits for village livelihood
4. Then take time or ask about the time for the meeting
5. Take toposheet map of the village or Google earth map print out
6. Conduct PRA
7. Give that toposheet or Google earth map to identify for which place having which is for like pounds ,irrigation canals, road, house, agriculture land, No of hand pump , No of wells etc
8. After that ask then what do you understand by watershed management
9. Document verification
10. Land measurement
11. And final programme implemented with proper survey

List of document

1. Adhaar card
2. Land paper
3. Khatiyaan paper of the land
4. Job card

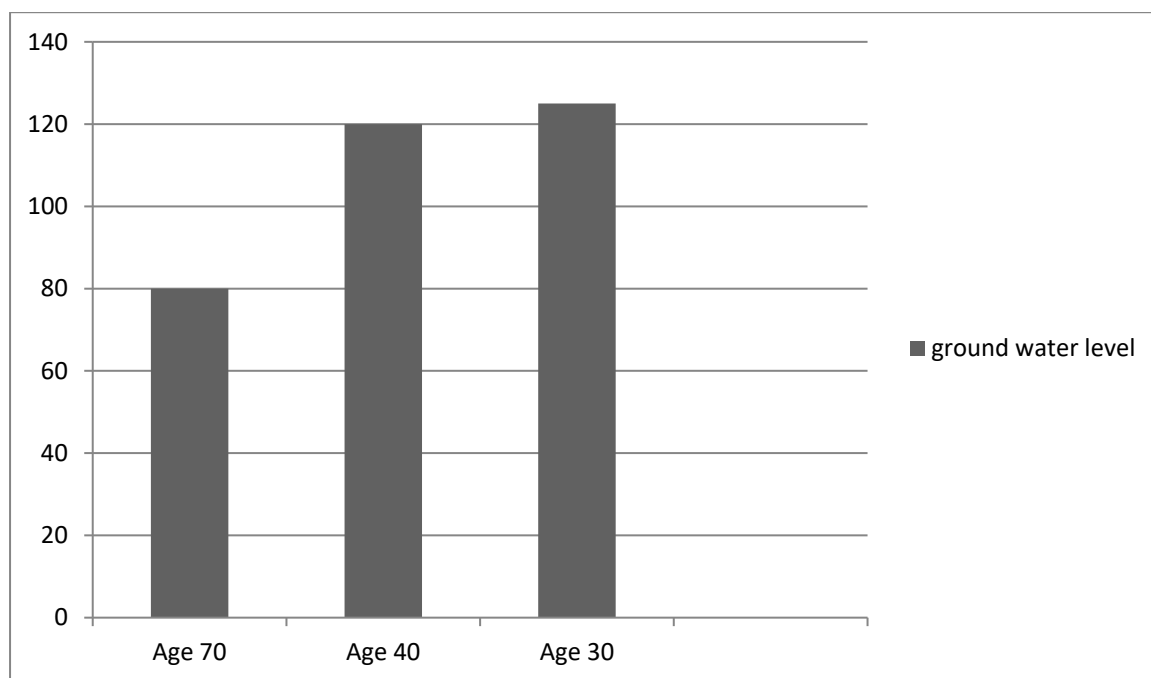
Involvement of women during planning process

- The preparation of various map of the village
- A Resources map
- The current land use map of the village
- The interventions map
- To identify the overlaying family based plan map
- To Prioritizing and budgeting works
- Role division for implementation and supervision by community

Chapter 6

Results

Table 1.4 A total different age group people answer about the level of Ground water level to find out the the level of water how much decreases –

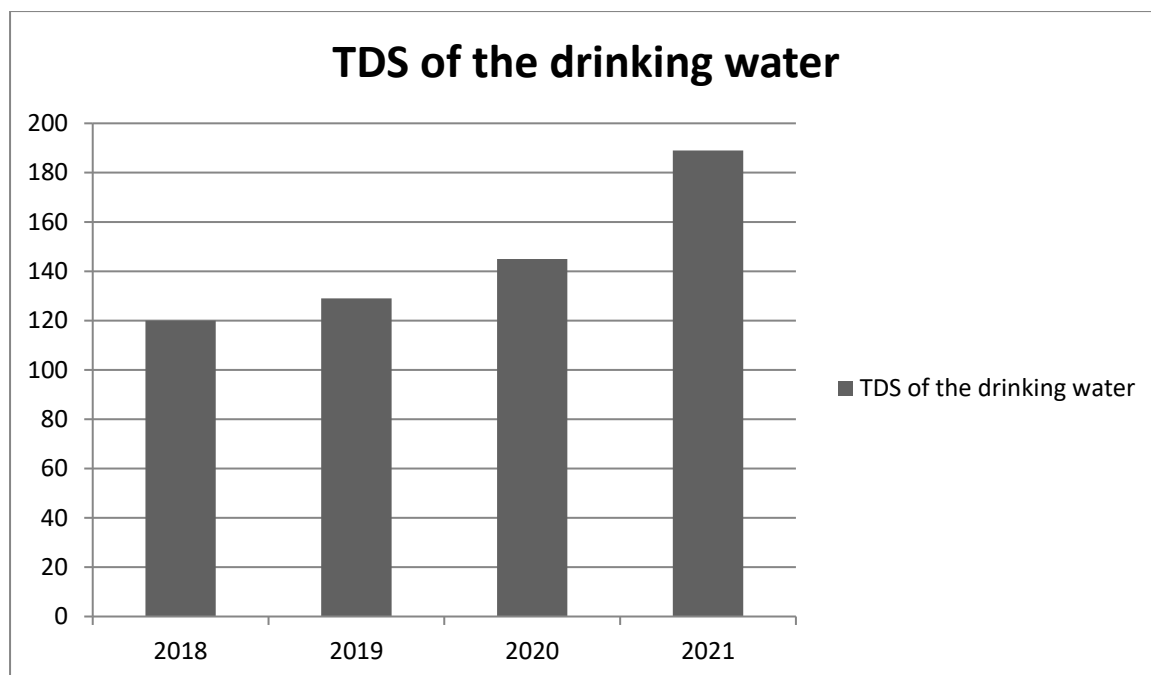


When we asked form the different age group of the people to know the the level of ground water how much decrease form last 70 year .we find that the level of ground water decrease 80 feet to 120 feet

Age	Age 70	Age 40	Age 30
Water Level	80 feet	120	125-140

Table 1.5

The quality of water is much important because its directly affect the people livelihood we checked the last four year data to checked the Water TDS of the water.



year	2018	2019	2020	2021
TDS level	120	129	145	189

This is the average water TDS of the water of the Anandpur Block TUTLIDIH village the level of drinking water quality also decreasing due to poor practice of watershed management from 2018 to the TDS of the water 120 to 189 .

Table 1.6

In this table we find out the SGH promotion, crop cultivation in total area and the physical Infrastructure of the village is –

s.no	particular	Pre -treatment	Post treatment
1	SHG promotion	0	45 (140 members)
•	Total created distributed	0	19.79
2	Crop cultivation		
•	Net shown area	428.50 ha.	625.25
•	Area under double cropping	60 ha.	309.
•	Cropping intensity	110 %	160%
3	Physical infrastructure		
•	Water harvesting tanks	0	0
•	No of ponds	4	4
•	Land husbandry	0	177.19ha.
•	Plantation and pasture dev.	0	10hac.

Table 1.7

The total no of wells, hand pump ,ponds, small ponds and private owned ponds are –

s.no	Water reservoir	Total number	Scheme
1	ponds	4	MGNREGA
2	wells	5	MGNREGA
3	Hand pump	4	MEREGA
4	Private owned ponds	2	PRIVATE

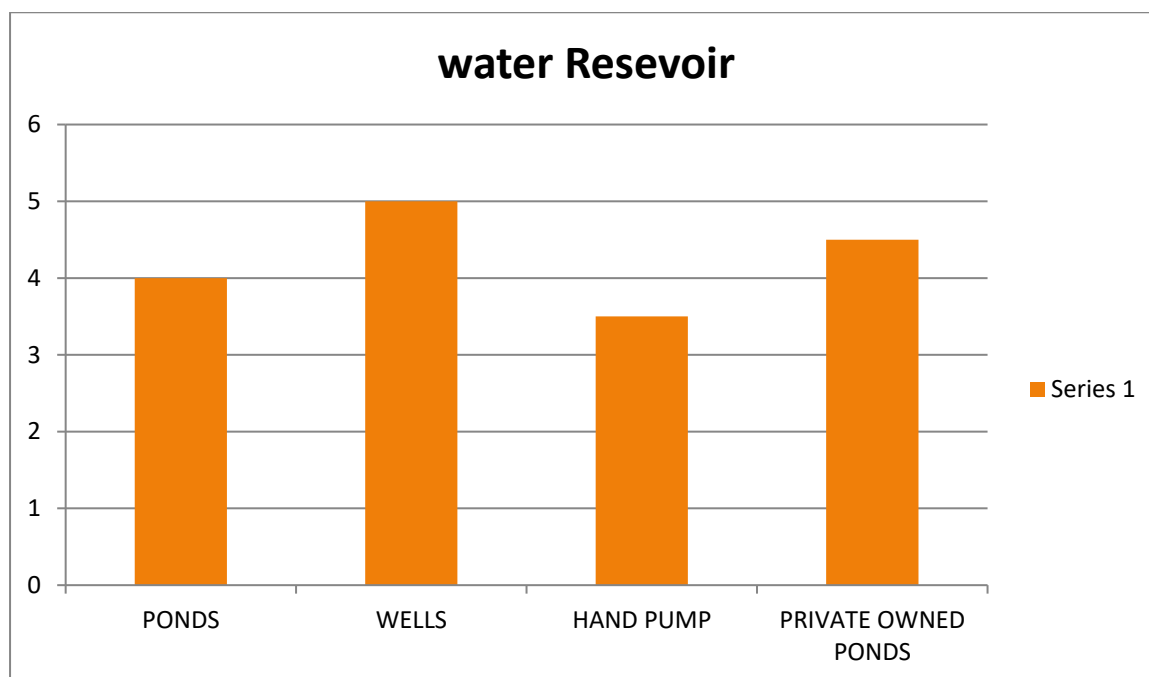


TABLE 1.8

LCC maps are shown in the map with the standard colours

	Capability Class	Colour Notation	
Cultivable	I		Light Green
	II		Yellow
	III		Red
	IV		Blue
Non-Cultivable	V		Dark Green
	VI		Orange
	VII		Brown
	VIII		Purple

This table showing that the cultivable and non-cultivable land according to class capability and we marked colour notation

TABLE 1.9

Example

For understanding land capability is are –

Diagram showing the intensity with which each Land Capability class can be used. Shaded portion shows uses for which classes are suitable. There are increasing limitations on the prudent use of lands moving from Class I to Class VIII. There is also decreasing adaptability and freedom of choice of uses.

Increased limitations and hazards ↓ Decreased adaptability and freedom of choice of uses		Land Capability Class	Increase in intensity of land use								
			Wildlife	Forestry	Grazing			Cultivation			
					Limited	Moderate	Intense	Limited	Moderate	Intense	Very intense
	I										
	II										
	III										
	IV										
	V										
	VI										
	VII										
	VIII										

Source: Brady, 1984

Table 1.10

This table showing that in cultivated land cultivated land classification and the possible treatment are different types of soil.

Land Classification and Possible treatments								
	Class	Texture	Soil Depth	% of Slope			Erosion class	Possible treatment
				Alluvial soil	Balck soil	Red Soil		
Cultivable land	I	sicl, cl,l,sl, sil,scl	> 90cm(d5)	0-1(A)	0-1(A)	0-1(A)	sheet erosion (e1)	improve fertility treatments like VC and compost
	II	sicl,cl, sl,sil,scl	45-90cm(d4)	1-3(B)	1-3(B)	1-3(B) 3-5 (C)	sheet erosion (e1)	NFB/TCB
	III	sc,sic,c, ls	22.5cm-45cm (d3)	3-5 (C) 5-10(D)	3-5 (C)	5-10 (D)	rill erosion (e2)	NFB/TCB, PB,EGP and FP
	IV	c,s	7.5cm-22.5cm (d4)	10-15(E)	5-10(D)	10-15(E) 15-25(F)	small gullies erosion (e3)	NFB/TCB. EGP,SGP,SP,FP, PB, DOP, WAT, MCD, MPT and CCT
	V	Same chareceristics as class-I land except for one or more limitation of wetness or stoness or rockiness or advers climatic conditions.It has no hazard of erosion unlike class I lasd					Gullied erosion (e4)	Not suitable for treatment
un Cultivable land	VI		7.5cm or less (d1)	15-25(F)	10-15(E)	25-33(G)	Gullied erosion (e4)	CCT,SCT, WATand SB
	VII		7.5cm or less (d1)	25-33(G)	15-25(F)	33-50(H)	Bad lands	CCT,SCT, WATand SB
	VII		Rock	>33	>25	>50	Bad lands	SB

Use of Pond under MGNREGA constructed by in TUTLIDH VILLAGE OF ANANDPUR BLOCK WEST SINGHBHUM JHARKHAND

1. Had more than one meter water last year in 4 ponds Raja talaab, and Rani ,pond and other 2 ponds in spite of the scanty rainfall.
2. Average coverage of low medium ponds is (15 nos) are **Rabi crop 2.5 h and summer 1.5 h**
3. The community does crop planning as per water availability in the ponds

Chapter 7

CONCLUSION

It's not the destination but the journey is important .As I hereby come to conclude my report I realize this internship as a journey has been vital and highly contributing towards my knowledge and overall development. Though a two months period is very less to understand each and every workings of an organization, however its was quite enough to learn the basic structure of a watershed management project :its working and evaluation .To my personality ,the internship has been a major force of change .It not only allowed to work under a completely new social-economic and lingual structure ,it also ensured that I adapt accordingly .

As I conclude I believe that this internship will actually influence my future career to work in socio-administrative positions. Along with this I have realized the actual application of proper mathematical calculation and some traditional method of water harvesting.

IN THIS PROJECT THE Evaluation strategy for watershed management projects. AND Along with this the report tries to make further recommendations to make evaluation strategy more impactful towards society. Attempts have been made to include certain points of change which can ensure the overall impact of watershed project on soil structure as well social economics to such an extent that we can actually realize whether project is providing a net present value of profit or not. Precisely speaking the report tries to include mathematical models and improve livelihood of the people and increase ground water level'

MENREGS fund being implied in the project with changing scenario in technologies and economics its ardent to incorporate qualitative as well as quantitative strategy of evaluation for watershed projects. Though WASSAN.

Chapter 8

Types of work and Intervention

IN SITU SOIL MOISTURE CONSERVATION

Harvesting Rainfall in situ and store in soil profile for the longest period possible

WATER HARVESTING

Conserve the runoff in small water bodies for spreading moisture and use in times of rainfall failures

STABILING AND REVIVING STREAMS

Ensure safe discharge of excess run off by stabilizing the streams through enhancing base – flow and revive traditional

AGRICULTURE AND HORTICULTURE DEVELOPMENT

Revive agro-ecology through crop diversification and land use changes and appropriate agronomy with a focus on soil organic matter and no chemical pest management.

Effective convergence for using the harvested water efficiently.

BIO MASS INTENSIFICATION

Regeneration of common land, improving pastures, intensification of bio mass in private land and such other measures for ecological restoration

STRENGTHENING INTEGRATION OF LIVESTOCK AND FISHERIES

Improving fodder base in commons and private land livestock shelters fish nurseries to enable usages of water bodies into fish production.

LAND DEVELOPMENT

Control on field erosion ,improve soil profile to retain as much moisture

Chapter 9

Future perspective of organization

Goal

- ✓ Doubling the income of 1,00,000
- ✓ Regenerating the agro-ecology
- ✓ Securing livelihood and climate resilience

Objective

- ✓ Restoration of 3.9 lakh
- ✓ In the upper reaches of 24 selected blocks through comprehensive watershed treatment
- ✓ Improving crop intensity in 1.50 lakh
- ✓ Building capacities and knowledge of 4000 frontline functionaries of panchayat Raj Institutions communities and civil society organization.

Way forward

- ✓ Support adoption of technologies that can increase water productivity.
- ✓ Bring in more areas in existing W/S under similar treatments to Improve overall hydrology of the area,
- ✓ Investments in farm allied & off-farm enterprises for landless families, .
- ✓ Attending to well-being needs of the community such as drinking water and sanitation, electrification and better road connectivity.

Suggestions

- Watershed approach should be adopted and encouraged to the community (Area approach)
- Organize the community for collective action
- Make them understand the resources by departing training and induction program
- Plan for the Regeneration of the area (regeneration of NR, Production and Livelihoods) should be made for better result
- Community participation approach should be adopted right from planning to implementation of the water shed project

Conclusive learning's

- Watershed is the approach for sustainable livelihood for the farmers
- Watershed will help in improving ground water level and drinking water problem along with better irrigation facilities
- Mobilising & organising community for collective action
 - Regenerating natural resources
 - Sustainable & effective use of the natural resources
 - Improving livelihoods; of the poor in particular
- Focus on Biomass and biology
- Increase the participation of woman for the development

Chapter 10

REFRANCES

1. primary data collected from fild survey at anandpur block west, singhbhum distict, jharkhand, 10th june 2021 .
2. www.wassan.org/wassan_organisation
3. WASSAN_AnnualReport2008_11
4. maps.com/pays.php?num_pay=424&lang=en
5. www.watershed image.com

Chapter 11

APPENDIX

Questionnaire

I am from IIHMR UNIVERSITY JAIPUR, I am working on a project watershed at WASSAN. I would like to talk to you about this. The questionnaire will take less than 20 minutes. All the information I obtain will remain strictly confidential and your answer will never be identified.

Village Name –

FAMILY INFORMATION

Head of the family name		Age		
Husband Name				
Wife Name				
No of child				
Number of family member				

JOB INFORMATION

Husband occupation	yes		No		
Wife occupation	yes		No		
Do you have MGNREGA job card	yes		No		

LAND INFORMATION

How much land do you have		
---------------------------	--	--

caste

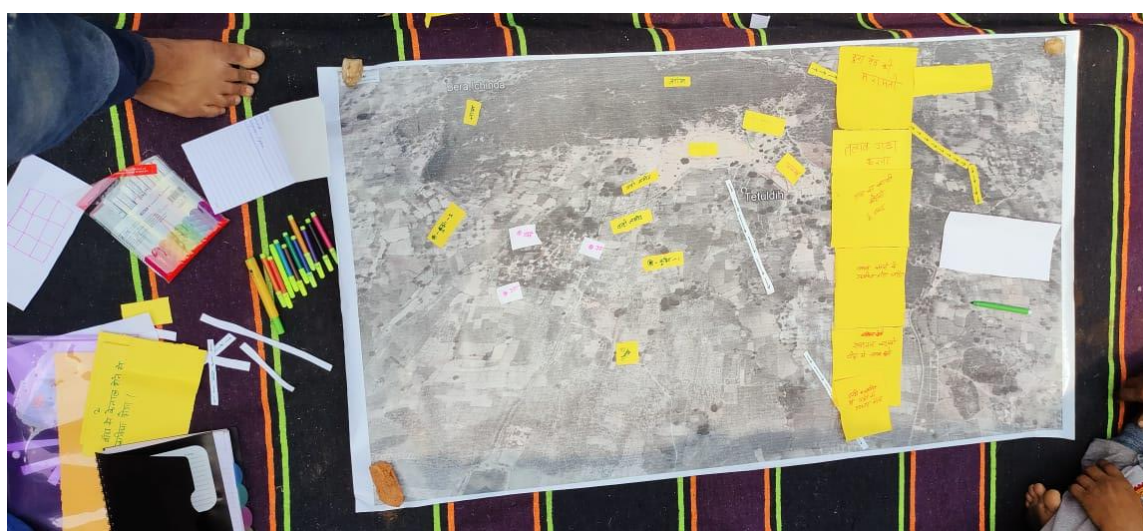
St		
Sc		
Obc		
Genral		

Plate -1



Conducting PRA

Plate -2



Troposheet map of TUTILDIH village

Plate -3



Document verification of the land

Plate - 4



Land measurement for the watershed project

Plate -5



Raja Talab

Plate -6



Koel River Manhorpur West Singhbhum district ,Jharkhand