

Model village plan under MGNREGA in Pichhulia Village of Keonjhar District, Odisha

Infrastructure for Climate Resilient Growth in India (ICRG) Programme

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1. Background

Agriculture in Odisha is the mainstay of majority of the populace and thus, holds the key to socio-economic development of the State. The State has cultivated area of 61.80 lakh hectares out of which 29.14 lakh hectares is high land, 17.55 lakh hectares medium land and 15.11 lakh hectares low land. The State is broadly divided in to 4 Physiographic zones those are further subdivided into 10 agro-climatic zones. Further, about 4 lakh hectares is exposed to saline inundation, 3.54 lakh hectares to flooding and 0.75 lakh hectares to water-logging, particularly in the deltaic areas. With more than 2/3rd of crops grown rainfed, a good harvest is much dependent on a favourable monsoon.

The climate of the state is tropical, characterised by high temperature, high humidity, medium to high rainfall and short and mild winters. The normal rainfall of the State is 1451.2 mm. The actual rainfall received, vary from district to district. About 84% of rainfall is received during the period from June to September. Even though the quantum of rainfall is quite high, its distribution during the monsoon period is highly uneven and erratic. As a result, flood, drought and cyclone visit regularly with varying intensity. The frequent occurrence of these natural calamities badly affects the production of kharif rice, the major crop of the State. Similarly, in drought years, there is considerable loss in production of pulses and oilseeds both during kharif and rabi(Source: Drought Management plan of Odisha 2015, Deptt. Of Agriculture, Govt. of Odisha)

1.1. MGNREGS implementation in Odisha and role of ICRG

In a state like Odisha, effective implementation of MGNREGS is the key to balance the degraded ecosystem in the rural areas and enhance the livelihoods security of rural population.

Progress parameters	FY 2018-2019	FY 2017-2018	FY 2016-2017	FY 2015-2016
Approved Labour Budget[In Lakhs]	950	900	800	760.06
Persondays Generated so far[In Lakhs]	611.5	922.17	774.48	894.46
Women Persondays out of Total (%)	42.1	41.86	39.82	38.02
Average days of employment provided per Household	33.09	39.98	38.09	44.78
Differently abled persons worked	7262	9329	6303	5586
% of Expenditure on Agriculture & Agriculture Allied Works	64.53	71.34	65.92	52.29
Total Exp(Rs. in Lakhs.)	1,63,694.67	2,50,479.89	2,13,572.78	2,05,148.18

The state has been able to spend about Rs 2500 crore for creating persondays of about 922 lakh as of last financial year. The %age of expenditure in agriculture and allied activities has been increasing and it was 71% in last FY. Differently abled people are also getting more and more engagement under the scheme.

Infrastructure for Climate Resilient Growth Programme (ICRG) is being implemented in 35 Blocks of 5 districts of Odisha (Mayurbhanj, Keonjhar, Balangir, Kalahandi and Nuapada). Later on 11 more Blocks and one new district (Bargarh) have been added in the programme. Demonstration of Climate Resilient Works (CRWs) through integrated approach is the key focus under ICRG in Odisha. The

programme builds the capacity of administrative and technical staff at different level to take up climate change specific plans under MGNREGS and incorporate the climate resilient designs in the MGNREGS works. While demonstrating the CRWs leveraging resource from other schemes and programmes is also the priority for the programme.

1.2. How the model villages are selected?

The Model Village Plan has been prepared based on net planning approach to saturate MGNREGA works in the village taking consideration of water availability (both supply and demand), historical rainfall pattern and future projection.. At the pilot stage, 2 villages are taken to make them model villages (one in Keonjhar and the other in Balangir district). The idea is to saturate the MGNREGS works in the villages so that maximum resource can be effectively utilised. Following criteria have been followed for selection process of Model Villages.

- **Vibrant Gram Panchayats**– Because of the financial and functional strength of a Panchayat is extremely useful in preparing need based plans, executing the plans in a time-bound manner, vibrant and strong GPs are considered for showcasing results. The governance system of the GPs and the capacity of PRIs were studied in detail for selecting the GPs.
- **Potential for piloting new initiatives** – Introducing innovations are the key for demonstrating the impact for which the GP has to offer avenues for experimenting with new initiatives. Hence it is important that the GP officials and the institution leaders must be in a position to move out of their comfort zone and accept the concept of change while introducing innovations.
- **MGNREGS Potential in the GP**- Because MGNREGS is the platform for implementing ICRG and the base for leveraging resources from other schemes for synergy, it must be effectively implemented in the GP. Right kind of plan, timely execution of works, proper monitoring system in place, active role of PRIs, need based works in place are some of the parameters taken up to ensure effective implementation of MGNREGS in the GP.
- **High potential GP**- The GP must come under the high potential category meaning that the scope of fund absorption must be very high from different schemes, presence of diverse groups, availability of natural resources and focus of the local administration. This must invite implementation of schemes like, ITDA, WADI, NRLM, PMKSY, IWMP etc.
- **Presence of historically marginalized groups**- Across the State the poor access of vulnerable groups to MGNREGS and other flagship schemes has been an issue. At the same time climate change projection reports that these groups are likely to be highly impacted by climate change in future. Hence their presence in the GPs are considered as well for selection.
- **Geographical coverage**- While selecting the GPs the sensitivity of the blocks and panchayats to climatic change was considered based on the climate modelling study report, Vulnerability assessment reports etc. Hilly and plain terrains were also taken into consideration for selection of GPs/villages.

1.3. Key approaches and processes followed.

The model village plan was prepared through participatory and technical approach involving all sections of the village, Gram Panchayat Sarpanch, Gram Rojgar Sevak (GRS) , PRI member, Village Mate, Women SHG leaders etc. Following key processes were followed for preparing the model village plans.

- Household level Baseline Data Collection

- Collection of Cadastral Map from Tehsil Office
- RoR download from Bhunaksha Portal
- Social Mapping with Villagers to understand the village scenario
- Focused Group Discussion (FGD) on various issues related to MGNREGA Assets and Potential NRM Works, Drought Occurrence, Agriculture Productivity, Cropping Pattern, Migration, Livelihoods of Vulnerable Communities, Livestock, Irrigation and Ground Water Status, Women Institutions (SHGs), Drinking Water etc.
- Identification and Mapping of Existing Assets, Forest cover and Pasture land
- Transact walk to various patches, assets, Water Harvesting Structures, Barren land etc. to understand the existing water table and availability , soil texture , cropping pattern
- Identification of NRM works proposed, Plot Numbers, Beneficiary and marking in the treatment map with different intervention icons.
- Plot wise Planning of NRM and Livelihood Assets (Community and Individual Assets) with various categories of Households under MGNREGA and other schemes.
- Preparation of Agriculture based livelihood interventions integrating the Water structures (Existing and Proposed) for doubling income of farmers with innovation on agriculture.
- Preparation of Off-farm livelihood plan with the poorest communities for enhancing their income.
- Analysis of MGNREGS offtake in the village and GP
- Preparation of Present and Proposed Treatment Map with plot wise planning.
- Water Budgeting (Measurement in existing water bodies, capacity calculation for current and future water bodies, present water supply and water demand and future requirements)
- Preparation of broad prospective Action Plan on saturation approach under MGNREGA and Budgeting of activities /works .
- Sharing, vetting and approval of action plan with the village communities

2. The village and Block Profile

Ghatagaon is one of the 13 blocks of Keonjhar district. The block has 26-gram panchayats, 142 villages and a total of 26,882 households. The total geographical area of the block is 740 q.km. out of which the net sown area in the block is 0.26 %, 49.39 % forest area and 7.03 % net irrigated area. According to 2011 census, the total population of the block is 1,18,307 out of which the average percentage of SC population is 5.6% and ST population is 64.8%. The percentage of vulnerability households of this block is 72.6 % which includes women headed households, differently able, other PVTG groups, small marginal farmers and migrants.

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2.1. Climate Change Scenario of Ghatagaon Block:

A study undertaken by Indian Institute of Science (IISc) Bengaluru under ICRG programme to understand the climate change scenario of the block in 2016 is discussed in the figure 1. Vulnerability Assessment undertaken by Ricardo in ICRG Programme shows that block has low adaptive capacity and climate sensitivity.

Historical (1984-2014)	
Historical mean maximum temperature	36°C
Highest temperature recorded	43°C
Change in mean maximum temperature	0.7°C
Mean JJAS rainfall in mm	1183
Coefficient of variation (CV) in %	22.2
Total number of rainy days for 30 years	2343
Average number of rainy days/year	78
Number of years with normal sowing rains	9
Number of years with abnormal sowing rainfall	21
Number of years with mild drought condition	12
Projected (2021-2050)	
Change in temperature relative to historical by 2035	1°C
Mean JJAS rainfall in mm	1160
Coefficient of variation (CV) in %	48
Total number of rainy days	2493
Average number of rainy days/year	83
% change in number in rainy days	6

Fig. Climate change scenario of Ghatagaon block, Keonjhar, Odisha

2.2. About Pichhulia Village

The Badapichhulia GP have two villages with overall vulnerability percentage is 92.37%. This GP has two villages namely Jharbeda and Pichhulia. Both the villages have more than 93% ST/SC percentage. Pichhulia have 320 HHs and 93.08% of ST/SC population.

The people of the Pichhulia village is socially, economically and educationally very backward. Agriculture is the major source of income in this region. In-addition most of the people depend up-on forest products to supplement their agricultural income. But income from forest produces is also decreasing day by day due to destruction of forest and intervention of vested interested group. The people are farmers by occupation, depending solely on rain water for cultivation. There is no irrigation facility. The rocky and hilly ground doesn't retain water; hence they cultivate only one crop in a year. The life of these people depends on the success or failure of agriculture in each year. Farmers totally depend on monsoon, as they have no source of irrigation. However large parts of the region are hilly with varying degree of slops due to which drain off is quit rapid. Monsoon failures make farming community more vulnerable. Rainfall is highly erratic. Heavy downpour is often followed by long dry spells. Consequently, farmers are frequently hunted by the failure of crop failure even as the overall rainfall may be normal. Undulating terrain, high rainfall and poor land and water management has resulted in large-scale soil erosion resulting in declining farm productivity, especially on the uplands, which are increasingly being cultivated to meet food needs of a growing population. As a result there

has been an increase in the number of people giving up cultivation and opting for casual labour or work outside. Thus, what is needed is to access to sustainable practices through climate resilient works to assist them to come out from the poverty cycle.

Details of Pichhulia village		
01.	Total area of the village in ha	762
02.	Total Families	320
03.	ST Families	313
04.	OBC Families	07
05.	Total population	1273
06.	Total Male	617
07.	Total Female	656
08.	Forest Area (Ha)	281
09.	Non-Agriculture use (Ha)	97
10	Permanent pasture and other grazing (Ha)	183
11	Cultivable wasteland (Ha)	1.21
12	Current Fallow Land(Ha)	98.7
13	Net sown area (in Ha)	101

2.3. Land, Agriculture and Irrigation Profile of the Village

Figure 1: Details of the village

Sl. No	Particulars	Total area in Ha
01.	Total area of the village	762
02.	Net-sown area	101
03.	Non-Agriculture use area	97
04.	Permanent Pasture and other grazing area	183
05.	Cultivable waste land	1.21
06.	Current fallow land	98.7
07.	Un-irrigated area	101
08	Forest land	281

Source: SECC 2011.

2.4. Topography

The village is a highly undulating topography with small to large size hillocks/hills mostly covered with tress and stone blocks. 49% of total geographical area of the village is covered with forest. The elevation differs from 300m to 595m (msl). As there are small and steep hillocks covered with mostly stone blocks along with good cover of trees and shrubs, there is high to moderate runoff impact in the

cultivated land depending upon the catchment area. Most of the cultivated land situated in the altitude ranges from 300 to 350m msl. As there are huge differences in altitude, there is high to moderate impact of runoff in the cultivable land causing severe to moderate soil erosion seen in some of the upland patches. Most of the runoff water generated in the hills flows through these agricultural lands and hence there is also soil nutrition loss.

2.5. Rainfall

The mean rainfall of Ghatagaon block between the month of June to September over a period of 30 years (1984-2014) is 1183 mm and its coefficient variation is 22.3%. According to the 30 years historical data, the highest rainfall (mm) received in a day is 218 mm and the number of years with normal sowing rain pattern is 9-year whereas 21 year it received abrupt and erratic pattern of rainfall. Ghatagaon block has suffered moderate drought in last 30 years but it also suffered extreme drought for 2-3 years. According to the climate model study it is projected that the percentage of change in number of rainy days (2021-2050 years) will be 6 % and the projected coefficient of variation of the rainfall will be 48 for 2021-2050 years.

2.6. Key Issues in the Village

Resource mapping, social mapping and identification of climate vulnerability issues process has been carried out with the support of ICRG team in the village meeting. The key issues of the Villagers are:

- 96% Households are under Poor and Vulnerable Category as per SECC data.
- Moderate runoff intensity due to barren land
- Moderate to severe soil erosion
- Less cultivable land and irrigated land in the village.
- Mild to severe drought during monsoon causing 30% to 50% kharif crop damage (CCVA)
- Low Crop Productivity
- Lack of Assured Irrigation Facilities
- Existing Check dam and Water Bodies to harvest rain water but available water of the water bodies are not utilized for Rabi crop production
- Availability of Barren & Waste Land and opportunity for treatment
- Potential for Vegetable cultivation
- Available of 220 active job cards under MGNREGS in the village.

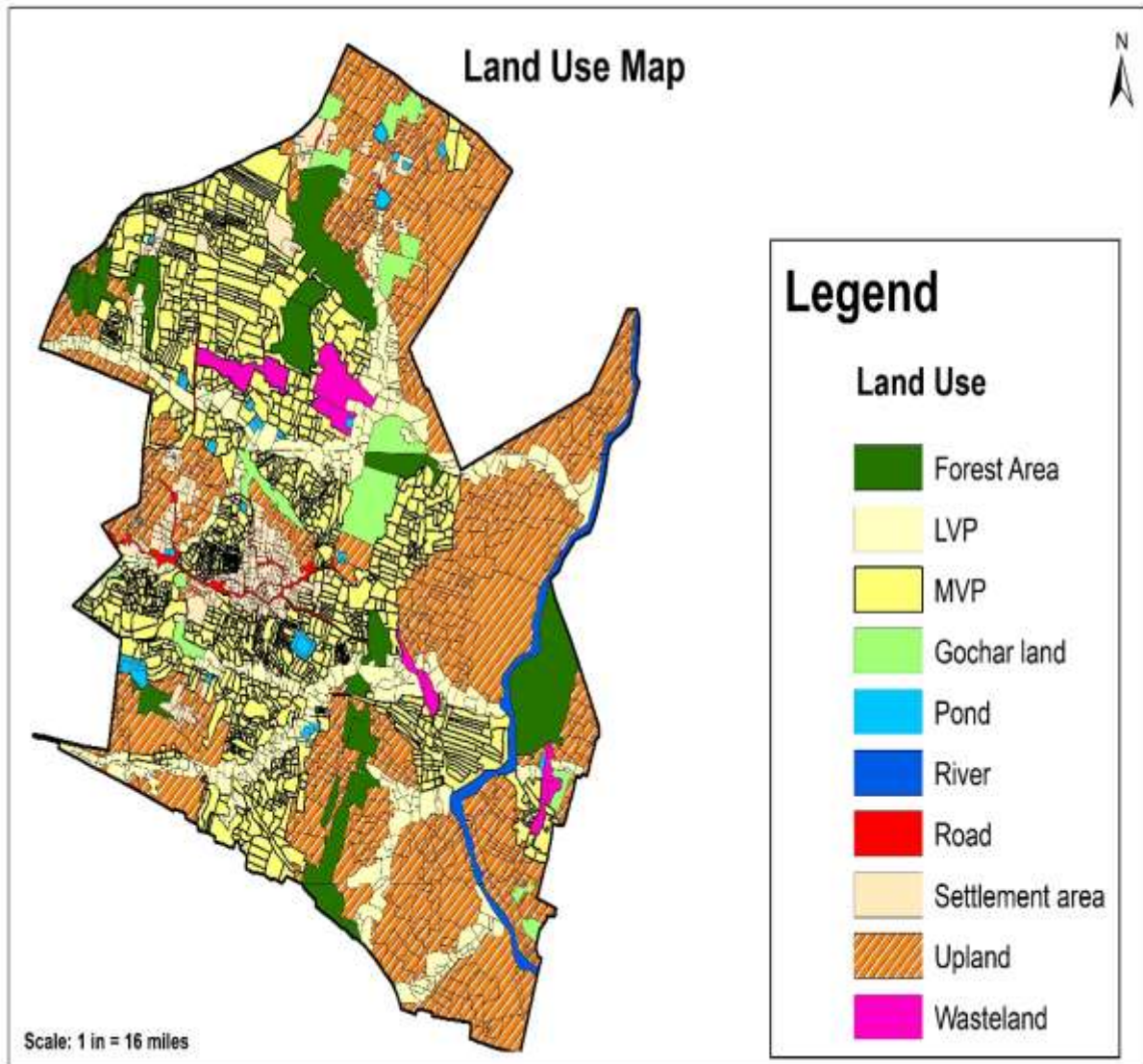
3. The model village plan

ICRG team facilitated preparation of model village action plan in the village with the participation of community, SHGs members, PRIs members and MGNREGS functionaries. Action plan map is one of the important map as from the map we can avail the information plot wise where the structures to be constructed & necessary treatment to be done. At first the boundary of Pichhulia village is identified. Before making the action plan map the villagers are directed to involve in social mapping of their village. They made it by providing all information about the 320HHs of Pichhulia village. They have identified the ST, OBC, Vulnerable HHs like woman headed which is very essential for planning process.

The villagers converted the cadastral map in to resource map indication the up land, low land, medium land, barren land, forest cover, water bodies in to different colours. The villagers are mobilized & identified their individual plot with accuracy & precision and existing resources in their plot. From the Google map using software & merging the plot wise ROR in Google map we get to know about the drainage line & water flow line, barren patch, low land, up land, forest cover etc plot wise &

beneficiaries wise details in full accuracy. The need & demand of villagers along with the available suitability of location to carry out rain water management works, plantation, primary bund, check dam, farm pond were identified and marked in the cadastral map. Moreover, the cadastral map is converted to action plan map by showing different essential works to be done with different colours in the map.

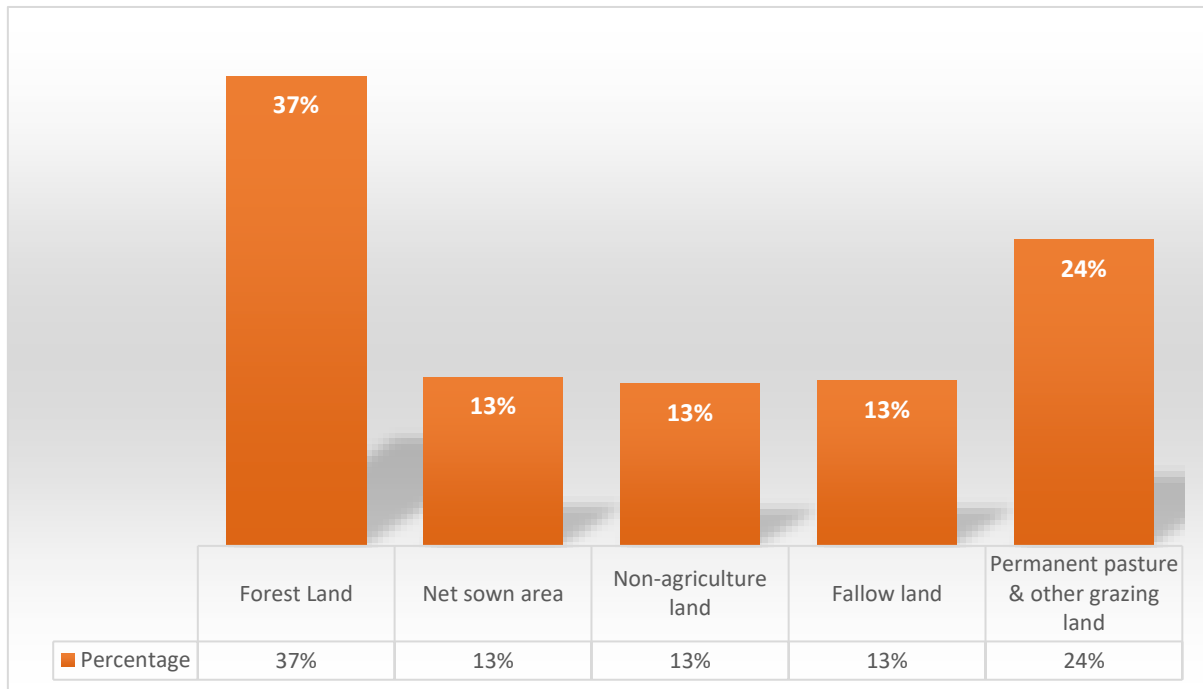
3.1. Land use pattern in the village



Land use map showing details of land types and uses.

The land use map shows that the village has very less productive land over total geographical area. Though cultivable area looking high comprising of upland, medium land and low land, however only low land area is mostly the productive area. The village also have low altitude forest area and it is almost 36.87% of total area, however the area is reducing now and through MGNREGA, mango plantation were taken in such area to keep balance of green coverage of the village, however from present land use map, it is clear that the forest area is still lower than what it was earlier. The village also have huge non agriculture use area (12.72%), permanent pasture and other grazing area (24%) and current fallow area of 12.95% as per SECC data, but the present trend shows that most of the land now cover with various crops as per land types, however to increase the productivity most of the

upland and medium land need treatment as well as assure irrigation water in Kharif and Rabi. The village also have a stream passes through it east side and have potential to create water infrastructures to irrigate both up and medium land near the stream.



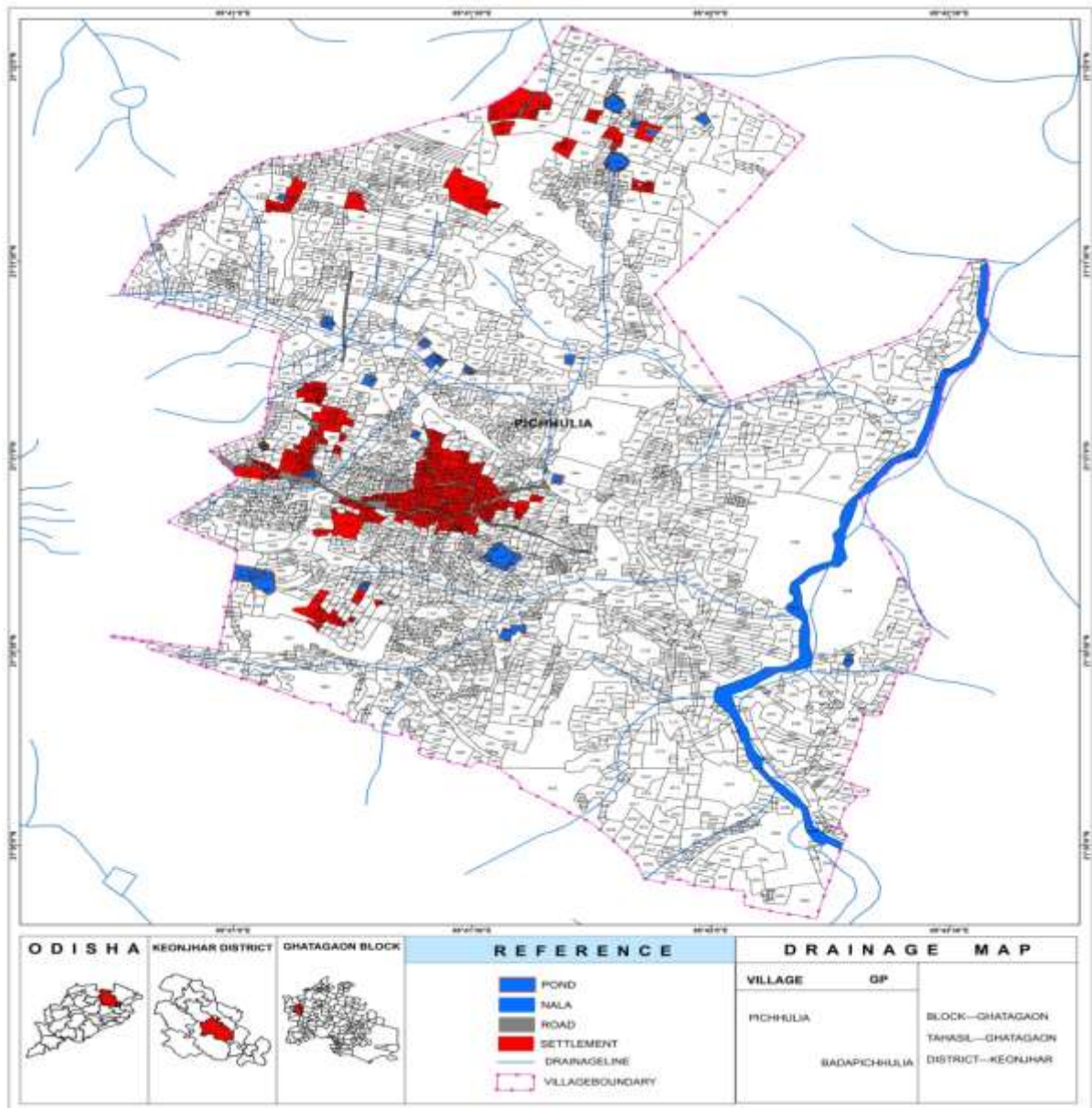
Source: District Statistics Report

3.2. Drainage and slope of the village

The topography of the village is undulating with drainage lines in many directions. The west side of the village get surface runoff from a low altitude hill. The part of east side also gets surface runoff from a low altitude hill. The following drainage and slope maps would able us to have better understanding about the hydrogeology of the village. These maps also would provide us the area those would have possibility to suffer either from floods or droughts in climate change context.

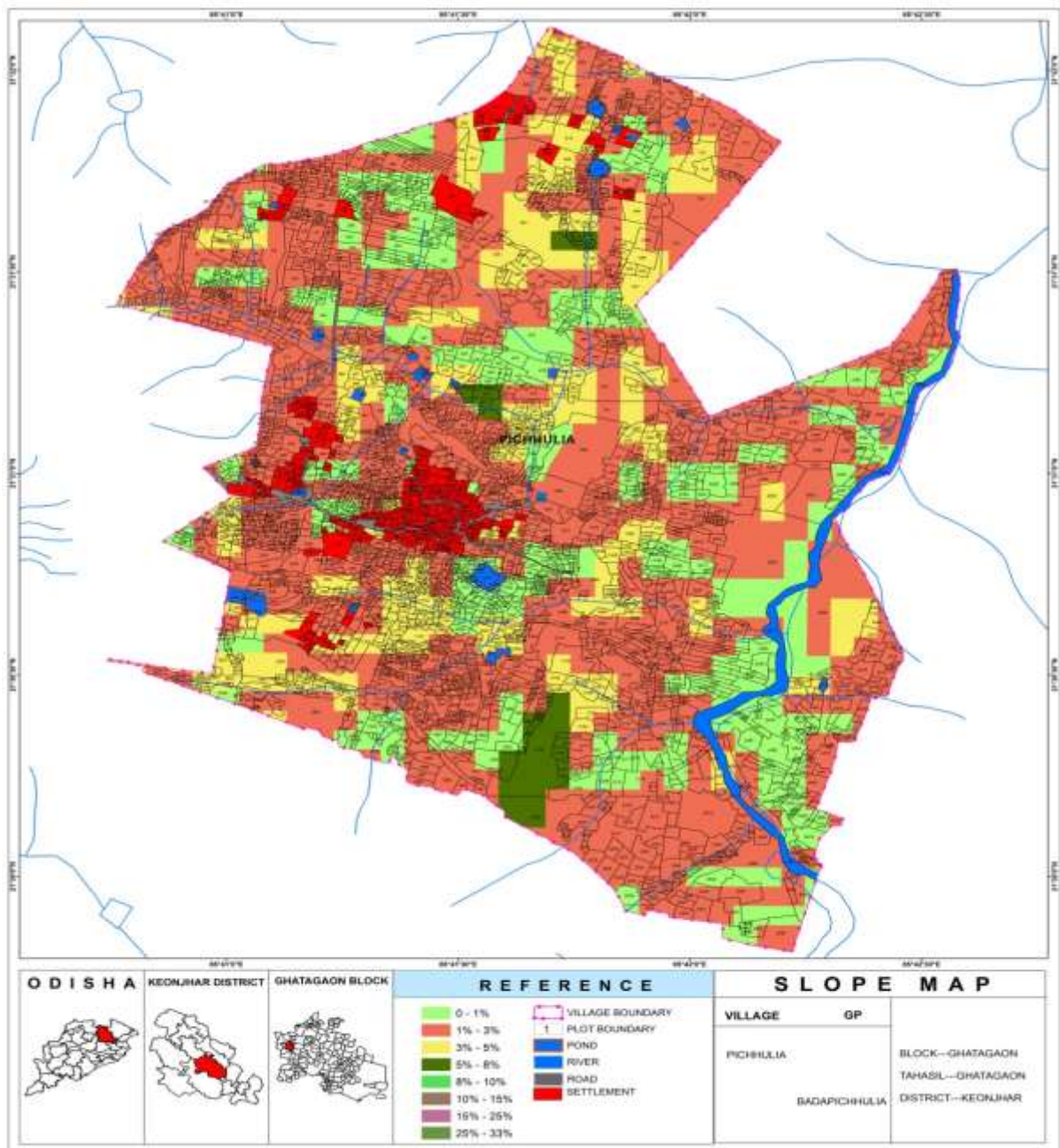
a) Drainage Map

From the drainage map the village mostly drains all its surface runoff water to the stream that passes through the East side of the village through low land paddy plots locally call it “Billa”. The drainage pattern divided almost 80% of the village area in to three micro watersheds and rest in to two other micro watersheds those fall in another village. However all these micro watersheds drain the water to the stream passes in the east side of the village. Hence the village have both recharge and discharge zones. Hence treating up and medium land would contribute more subsurface flow to the stream and thus changes is there to stay water for longer period in the stream. This also allow safe disposal of water to the stream during heavy rain and thus less chances of flood and reduction of soil erosion in all three types of land. Water harvesting would be efficient in stream as it would work as discharge zone along with irrigation well in some patches near the stream and lift irrigation systems in the existing check dams and new check dams can drastically increase irrigated area in the village.



b) Slope map:

The different patches and land types have different slopes. The village have highest 8% slope in three different locations else most of village area falls in 1 to 3% slope category and those are mostly up and medium land. There are few locations where the slope ranges from 3 to 5% and those are mostly upland. Almost all low land slope ranges from 0 to 1% and thus more vegetation and no soil erosion have been traces in low land area. The habitat area fall in 1-3 % slope. The stream in east side has passes through 0 to 3% slope area. As slope defined the nature of work to be implemented to conserve soil and water, the village has scope of taking up of trenching work in 5 to 8% slope area along with water absorption trench and primary bunds. Similarly earthen bunds, stone bunds are suitable in area where slope ranges from 1-5% and according to slope map the village have highest scope of taking up these activities along with farm ponds in 1-3% slope area. There are already water bodies and those are mostly situated in the adjunct point of medium and low land.



3.3. Water Budgeting (Water demand and supply assessment)

To compute the water demand and supply, water budget calculation template developed during the Saksham training of MGNREGA was used. The major finding of the water budget assessment is represented in the table below.

Total water for agriculture requirement has been calculated as 110.7Ha.m and water for animal and human has been calculated as 3.74 Ha.m. Total water requirement has been calculated as 114.44 Ha.m. The available runoff from the area is 347.3 Ha.m. The water deficiency to address the requirement is 110.3 Ha.m. Based in the available discharge of 343.4 Ha.m, maximum of 257.6 ha-m can be harvested to meet the requirement and it is far more than calculated deficit.

D.1 Drinking Water Requirement			
Description	Number	Daily (Litres) (source: SAMARTHYA)	Water Required (Daily)
Human	1273	45	57285
Large Ruminant (Animals)	1090	35	38150
Small Ruminant	830	8	6640
Poultry-Birds	1560	0.25	390
	Total		102465
Water Required Annually (Cum) ($D10*365/1000$)		37399.73	
Water Required Annually (Ha.M)		3.74	

D.2 Water Requirement for Crops (all seasons)						
	Crop	Area (Hect.)	required per (Ha-M)	Present Water Requirement (Ha.M)	Supply from groundwater	additional Requirement
Kharif	Black Gram	10	0.2	2.0	0.0	2.0
	Arhar	10.5	0.2	2.1	0.0	2.1
	Mung	6	0.2	1.2	0.0	1.2
	Paddy	106	0.9	95.4	0.0	95.4
Total		132.5	1.5	100.7	0.0	100.7
Rabi	Onion	4	0.45	1.8	1.4	0.4
	Potato	3	0.6	1.8	1.4	0.4
	Garlic	1	0.4	0.4	0.3	0.1
	Mustard		0.25	0.0	0.0	0.0
	Veg	10	0.6	6.0	4.8	1.2
	Total	18	2.3	10.0	8.0	2.0

D.3 Details of slope (Source: Land Revenue Department)		
Slope	Topography	Area (ha)
0 - 5%	Low lands (Farm lands)	295

5-10%	Medium lands (Pastures & Open Area)	467
10- 20%	Medium lands with more slope (Pastures & Open Area)	0
Above 20 %	Upper reaches & Forest area	0
	Total	762

D.4 Amount of Run-off				
(To be calculated from Strange's table method)				Rainfall:1193.8 mm
Types of Run-Off	Area (Hect.)	% of Runoff	run-off (Cum)	run-off (Ha.M)
Good Run-off Area	379.21	45.4	5419.852	205.5
Average Run-off Area	281.79	34	4058.92	114.4
Bad Run-off Area	101	22.7	2709.926	27.4
Total	762			347.3

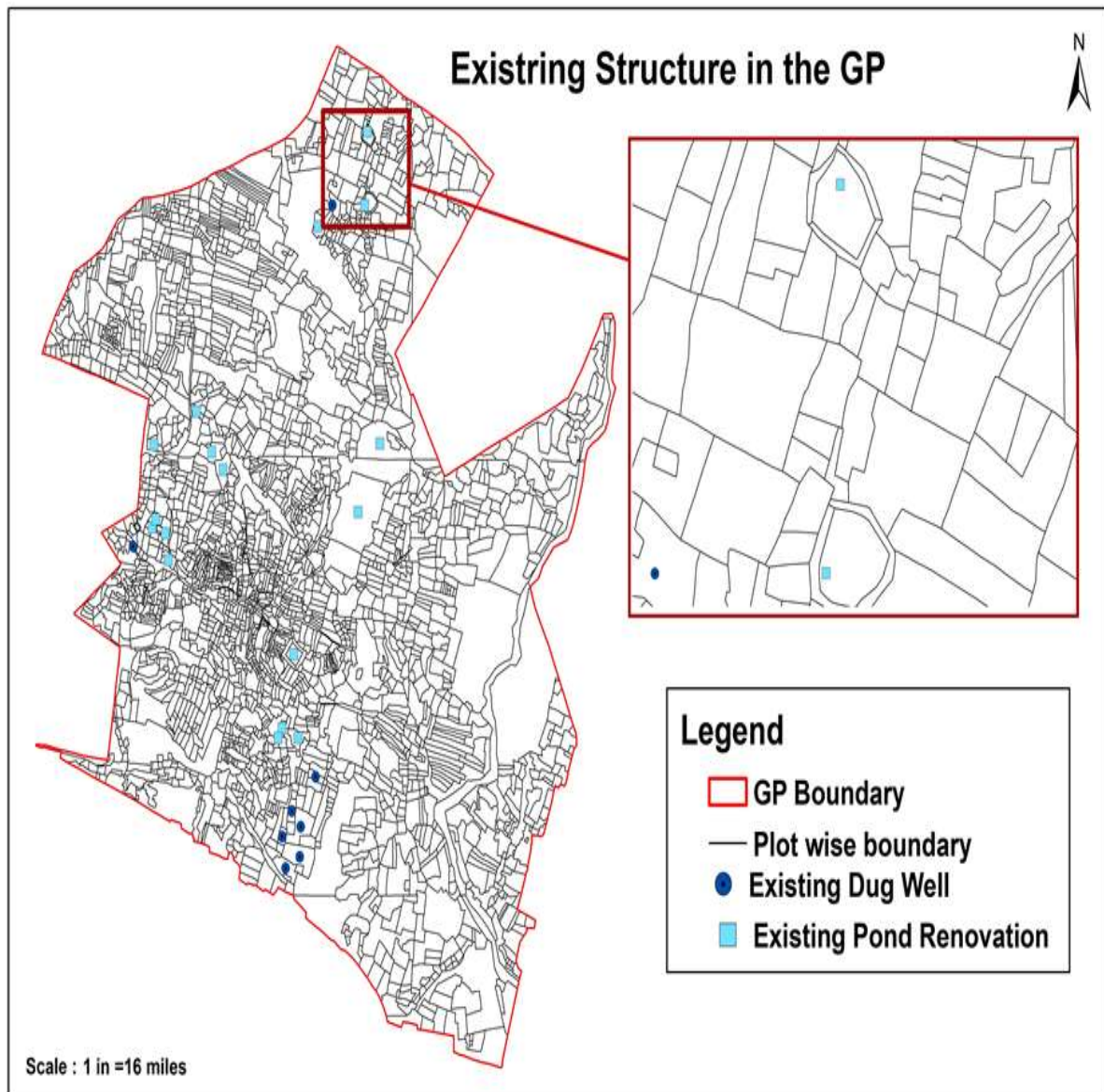
D.5 Stored Water in Harvesting Structures				
S.N.	Name of Structure	Existing Structures		
		No./Area in Ha	Storage (Ha.M)	Capacity
1.	Pond (Talab) 22 no's	1.284	3.852	
2.	Farm Pond		0	
3.	Anicut		0	
4.	CCT (Area in Ha.)		0	
5.	MPT		0	
6.	SGPT		0.0000	
	Total		3.85	

D.6 Village Wise Water Budgeting (Ha.M)			
S.N.	Name of Village		Volume (Ha.M)
1	Water for Agriculture (Table F.2)		110.7
2	Water for Animal & Human (Table F-1)		3.74

3	total water required (F1+F2)	114.4
4	Available run-off from rain water (Table D.4)	347.3
5	Harvested Runoff from Water Harvesting Activities (D.5)	3.9
6	Water deficiency/Surplus (5-3)	-110.6
7	Water can/to be harvested to meet up the requirement (75 % of available run-off -harvested run-off) $(D77*75/100-D78)$	257.6
8	Available discharge water at exit (4-5)	343.4

3.4. Existing works in the village

In the village there are few dug wells already exist along with some ponds renovated. The details of existing works are shown in the map below



3.5. Action Plan of Pichhulia Model Village

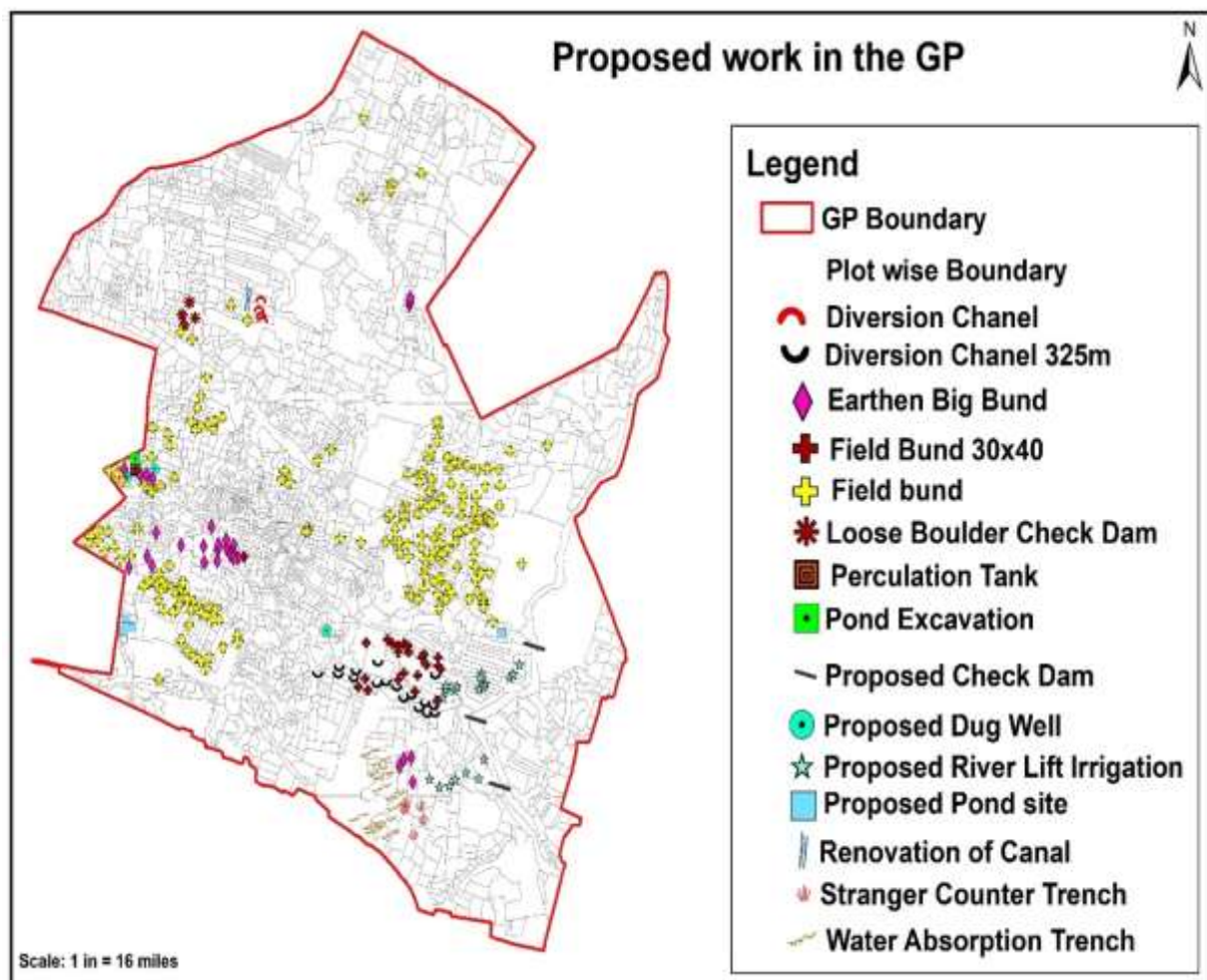
Looking the village issues after PRA exercise including transect walk, there are 16 different types of NRM work identified for the village Bada Pichhulia to increase the irrigated area and enhance the agricultural productivity of the village. These activities are taken in integration so that the efficacy and durability of each asset can be assured. Land development and plantation, SCT, LBCDs are taken in the catchment of WHS and CDs with Lift irrigation are examples of integration of NRM works enhance efficiency of each structure. Assets building in both community land where there is scope and individual land are emphasised. Rural connectivity such as construction of roads are also been considered under MGNREGA to develop the village as a model village. Livelihoods activities (on farm and off farm) are planned along with SHG women and prepared a convergence plan as per skill and demand of SHG women. The proposed NRM activities are shown in the action plan map below.

Proposed NRM works:

Budget Summary for Pichhulia Model Village-Odisha							
Sl	Activity	Area in acre	Nos. of beneficiaries	No of Plant	Material Cost	Labour cost	Amount (Rs.)
1	SCT	10.77	Community land and in individual land of 2 farmers		0	161493	161493
2	WAT/plantation	69.45	Community land and individual land of 4 farmers	389	64201	83386	147587
3	LBCD	4.08	Community land	0	49145	12286	61431
4	Earthen Big Bund bunds with PVC outlet (community land)-cluster -1	13.75	Community and 17 individual farmers		13520	182235	195755
5	Earthen Big bund with PVC outlet-cluster -2	13.58	Individual land 16farmers and 4.99 comm. land	0	13037	233084	246121
6	Construction of Check dam (3 nos.)	19.3	Community land		3632354	1212911	4845265
7	Renovation of canal 300rm	3.88	Individual land 2 farmers	0	0	117362	117362
8	Diversion channel in individual field	14.52	6.32 ac in community land and 12 no farmers land		0	233438	233438

9	Renovation of stone bunds	3.41	5 farmer land and 1 community land		0	78546	78546
10	Construction of dug wells (3)	1.55	3 individual farmers		415848	337824	753672
11	Percolation tank (1)	0.1	Community		15000	114232	129232
12	New tank excavation (3)	2.81	2-Individual and 1-community land		45000	499548	544548
13	Pond renovation (11nos)	10.32	3-Community and, 9- Individual land.		151000	2132644	2283644
14	Patch (2.81ac) and Boarder Plantation	18.81	2.81(ac)Community and 8 no individual	3386	558815	2323	561138
15	Field bunds (30*40 Model) 17.28 ac - community land	25.99	Community and 16 individual land		0	1783726	1783726
16	Cluster -1- Field Bunds (9-comm land and 17 individual land)	64.37	Community and individual land		0	351858	351858
17	Field bund with plantation	122.51	39 -Community and 34no individual land	19142.188	3159227	669662	382888
18	Cluster 2- Field bund	118.81	40 individual land and 42 community land		0	649437	649437
19	Lift irrigation (3 locations) in community land	39.04	benefitted 152 Individual land		1071000	128616	1199616
	Total			22917	9188146	8984610	18172756
	Note		No of plant	22917	Nos.		
			Community patches land	145	patches		
			Individual land	181	farmers		

			Material Cost	918814	1262		
				6	1		
			Labour Cost	898461	4936		
				0	6		
			Total Cost	181727			
				56			
			Person day generated		6198		
					7		



3.6. Proposed livelihoods activities and convergence budget:

Pichhulia village is having net-sown area of 101 Ha with huge potential for treatment of barren land and converting it to cultivable land. About 60% area of total net sown area belong to Up-land category. The key crops grown by the farmers are Paddy, Pulses (Green Gram and Arhar) and Vegetables during Kharif season and Vegetable production in selective patch during Rabi season. 17 Nos of SHGs are active in the model Village. Other Off- farm activities are goat rearing , ship rearing , poultry etc.

The Village is having issues of water scarcity and underutilization of available water. Kharif Paddy crop is affected by dry spells in up and medium land and the available water resources are not fully utilized during Rabi crop. So there is huge potential for promotion of Rabi Crop like Mustard, Wheat, Sunflower, Potato, Vegetables linking existing water bodies which may help farmers doubling their

income. Accordingly, plan has been prepared for linkage of JALANIDHI Scheme for establishing Lift Irrigation System through Odisha Agro Industries Corporation (OAIC) for effective utilization of available resources and excavation of dug wells to introduce cropping during Rabi season. Dedicated Human Resource Support will help mobilization of communities, farmers, market linkage, convergence etc with line departments and making things happen.

The Livelihood Plan has been prepared after transact walk to all patches in the village area, discussion with Villagers, SHG members on present cropping pattern, potential areas of intervention in the farm, non-farm and off-farm sectors based on water availability, market potential, skill of farmers, climate scenario and taking demand from various sections of the society like Women SHGs, Farmers, Vulnerable Households. Convergence with other line departments like Integrated Tribal Development Agency (ITDA), Agriculture and Horticulture, Animal Resources OAIC, Odisha Livelihood Mission etc has been mapped for implementation of livelihood plan. As per need, Framers' Producer Organization (FPO) may be formed for backward and forward linkage of the farm and non-farm production system to ensure better price. Further, better package of practices (PoPs) in in the farm sector shall be introduced in Paddy, Pulses, vegetable and other horticulture crops (introduction of Organic farming, climate resilient seed varieties in paddy, water saving technology, improved method of production like SCI/SRI, Integrated Pest Management and Integrated Nutrition Management practices, Soil health management) through Farmers Field Schools (FFS). Fishery activities shall be promoted in the existing water bodies where there is availability of water throughout the year. Regular vaccination of small ruminants, breed improvement in goaterly has been planned in the model village. Infrastructure support for value addition of agriculture produce have been proposed by the SHG members. Regular Capacity Building of the communities and strengthening of Institution is also highly required for better implementation of model village plan. The Villagers have also proposed Individual Assets under MGNREGA for improving their livelihoods. The proposed activities will lead to doubling income of farmers. The cost of convergence is discussed in the table below;

Sl no	Activities	Institution	Support	Amount (In Lakhs)	Area (in Ha.)
1	Initiating Crop Production in the proposed Land Development Patch	FADP(ITDA, Keonjhar)	Support of Seed and other Agri implements	3 lakh	10 ha
2.	Irrigation facilities nearby Land Development Patch	JALANIDHI/ Agriculture Department (OAIC)	Support of Pump, Pipe, Transformer etc. (03 Units)	8.1 lakh	15 Ha
3.	Improving Climate Resilient Cropping System	Dept. Of Agriculture	Introduce SRI methodology in Paddy	1 lakh	50 Ha
4	Introduction of Poultry Rearing in the MGNREGA supported Poultry sheds	ITDA	Support of Poultry Birds (48 Bird Capacity)	3 lakh	15 Units of 48 layer bird capacity
5	Demonstration of Vegetable Crop, Pulses Production during Rabi	ITDA	Support of Seeds and Other Inputs (Veg. Production)	1.0 Lakh	10ha

6	Promote Organic farming to improve Soil Nutrition	Odisha Livelihood Mission	Capacity Building of farmers on Organic Farming	0.50 Lakh	50 Ha
7.	Demonstration Alternative Climate Resilient Crops to reduce crop loss due to Climate Risk	Odisha Livelihood Mission	Support of Millet Seed for Demonstration of Ragi Production (Millet) in the MGNREGA treated patch	0.2 Lakh	5 Ha
8.	Introduce Climate Resilient Nursery Practices and water management system in the Vegetable Production System (Drip irrigation system)	Directorate of Horticulture	Demonstration of Green shed nets with Solar system	3 lakh	3 ha
9.	Introduce Fish Farming in the renovated Ponds	ITDA, Keonjhar	Support Fingerling to Farmers for Fish Production.	1.5 Lakh	3 Ha (03 Ponds)
10.	Capacity Building of Communities on Improved Package of Practices of Various Crops	OLM(NRLM)	Organizing Exposure Visits, Thematic Training on Various Crops, Poultry, Fishery and livestock practices.	2.0 Lakh	100 HHs (Approx)
11.	Strengthening of Community Institutions/Producer Groups etc.	OLM(NRLM)	Formation and Strengthening of Water User Groups/ Village Climate Committee/ Producer Groups etc.	2.0 Lakh	100 HHs (Approx)
12.	Promote Seed Production and Multiplication of short and medium duration Climate Resilient Paddy Varieties	IRRI-OLM Partnership	Seed Production of Climate Resilient Paddy Varieties	020 ha	10 Ha
	Total Cost of Expected Convergence			27.3	

3.7. Labour Availability Analysis and phasing of proposed NRM works

The Pichhulia village is having 377 job card holders and approximately 876 people registered as workers. Among the registered worker there are approximately 430 women workers under MGNREGA to work. However, it is found that there are 220 Active job card holder in the village to participate in MGNREGA works to be carried out in the village as part of model village planning.

As per labour budgeting process, under MGNREGA, total budget is = Active job card holder x 100 person days x daily wages under MGNREGA. This is equal to 60 percent of total work budget excluding

the Administrative costs. Considering this formula and 100 working days per HHs for 220 active job card holders with a present daily MGNREGA wage rate of Rs. 184 in Odisha, the total one year works budget for the village is 66.73 lakh. Considering, 80 percent of this budget can be spent on NRM works (if GP and block provide maximum emphasis on NRM works) then Rs. 53.38 lakh can be spent in year on NRM work. As the total budget of the proposed NRM work in the village is Rs. **18172756**. Thus, the entire plan can be implemented in 04 years considering availability of Budget, timely fund flow and smooth implementation of works.

Phasing of NRM works as per labour availability and yearly budget limitation.

Taking the limitation of yearly person days (considering all 220 active job holder will be worked for 100 days in a year, the village can engage a total person days of 220x100=22000 person days in a year) and yearly budget limitation of 53 lakh, demanded NRM work are distributed year wise to prepare a implementation plan. The plan is presented below in a table form so that during implementation this document can guide the implementers. During phasing of works some other factors are also considered, such as ridge to valley approaches, integration of activities and works those can bring resilience against drought and floods. In the first year mostly area treatment works are considered along with border plantation, so that the treatment of the catchment area of water harvesting structures could be done before start working on new or renovation of a WHS. Emphasis was also given during distribution of yearly work on biophysical parameters such as highly eroded area, water logged area etc.

Sl	Activity	Area in acre	Distribution of person days				Distribution of Budget			
			Year 1	Year 2	Year 3	Year 4	Year 1	Year 2	Year 3	Year 4
1	SCT	10.77	887	0	0	0	161493	0	0	0
2	WAT/plantation	69.45	164	382	0	0	44276	103311	0	0
3	LBCD	4.08	0	135	0	0	0	61431	0	0
4	Earthen Big Bund bunds with PVC outlet (community land)-cluster -1	13.752	1020	0	0	0	195755	0	0	0
5	Earthen Big bund with PVC outlet-cluster -2	13.58	1299	0	0	0	246121	0	0	0
6	Construction of Check dam (3 nos.)	19.3	0	3885	3885	3885	0	1615088	1615088	1615088
7	Renovation of canal 300m	3.88	0	645	0	0	0	117362	0	0
8	Diversion channel in individual field	14.52	0	0	641	641	0	0	116719	116719
9	Renovation of stone bunds	3.41	432	0	0	0	78546	0	0	0
10	Construction of dug wells (3)	1.55	0	809	809	809	0	251224	251224	251224

1 1	Percolation tank (1)	0.1	0	0	648	0	0	0	129 232	0
1 2	New tank excavation (3)	2.81	0	936	936	936	0	181 516	181 516	181 516
1 3	Pond renovation (11nos)	10.32	1172	3584	3584	3584	2132 64	690 127	690 127	690 127
1 4	Patch (2.81ac) and Boarder Plantation	18.81	780	0	0	0	5611 38	0	0	0
1 5	Field bunds (30*40 Model) 17.28 ac - community land	25.99	9801	0	0	0	1783 726	0	0	0
1 6	Cluster -1-Field Bunds (9-comm land and 17 individual land)	64.37	1933	0	0	0	3518 58	0	0	0
1 7	Field bund with plantation	122.51	0	2673	2673	2673	0	127 629 6	127 629 6	127 629 6
1 8	Cluster 2- Field bund	118.81	357	1071	1071	1071	6494 4	194 831	194 831	194 831
1 9	Lift irrigation (3 locations) in community land	39.04	0	726	726	726		399 872	399 872	399 872
	Total		1784 4	1484 6	1497 3	1432 5	3701 120	489 105 8	485 490 5	472 567 3
Total of 4 years						6198 7				181 727 56

The proposed yearly budget for 1st year is 37.01 lakh, 2nd year is 48.91 lakh, 3rd year is 48.54 lakh and 4th year is 47.25 lakh. In all the year the budget is lower than the budget limit of the village of 53 lakh. Similarly the distribution of person days in 1st year is 17844, 2nd year is 14,846, 3rd year is 14973 and 4th year is 14325 and these are also much lower than the maximum person days the village can contribute to implement MGNREGA work of 22,000 person days per year.

4. Way forward

All the works proposed in the Plan will be approved following MGNREGA procedure. An operational plan shall be devised to implement the plan in a saturation mode. Planning and implementation of various works for the whole village with saturation approach will bring desired result and impact to all households of the village for mitigating serious climate issues like drought, crop damage, creating irrigation potential for improving net sown area , improving agriculture productivity and livelihoods of the communities. The village will be a showcasing model for the entire state once all MGNREGS works are saturated and their impact is visible. The approaches and methods of saturating MGNREGS in work in the village could help the Block and district administration in taking model village interventions in a large scale.