PAN Network Pvt. Ltd.

Inception Report of CSRA-INDIA Watershed

In Bharkata & Gonpur Gp, Birbhum District, West Bengal.

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Contents

Background:

Situated amidst the verdant fringes of mixed forests, the project area encompasses 27 villages spanning 8 revenue villages within the Bharkata & Gonpur Gram Panchayats, nestled in the rural expanse of the Mahammad Bazar Block within Birbhum District, West Bengal. This initiative receives support from the Paul Hamlyn Foundation (PHF) and is spearheaded by the NGO "CSRA-INDIA (Surul Center For Service In Rural Area)" as part of the CSRA Project - CSRA Group Leading Actions for Water Security and Sustainable Development, dedicated to the holistic betterment of Birbhum's rural communities. The project unfolds over a span of six months, driven by a comprehensive vision aimed at fostering community empowerment and environmental sustainability.

The core objectives of the project are multifaceted:

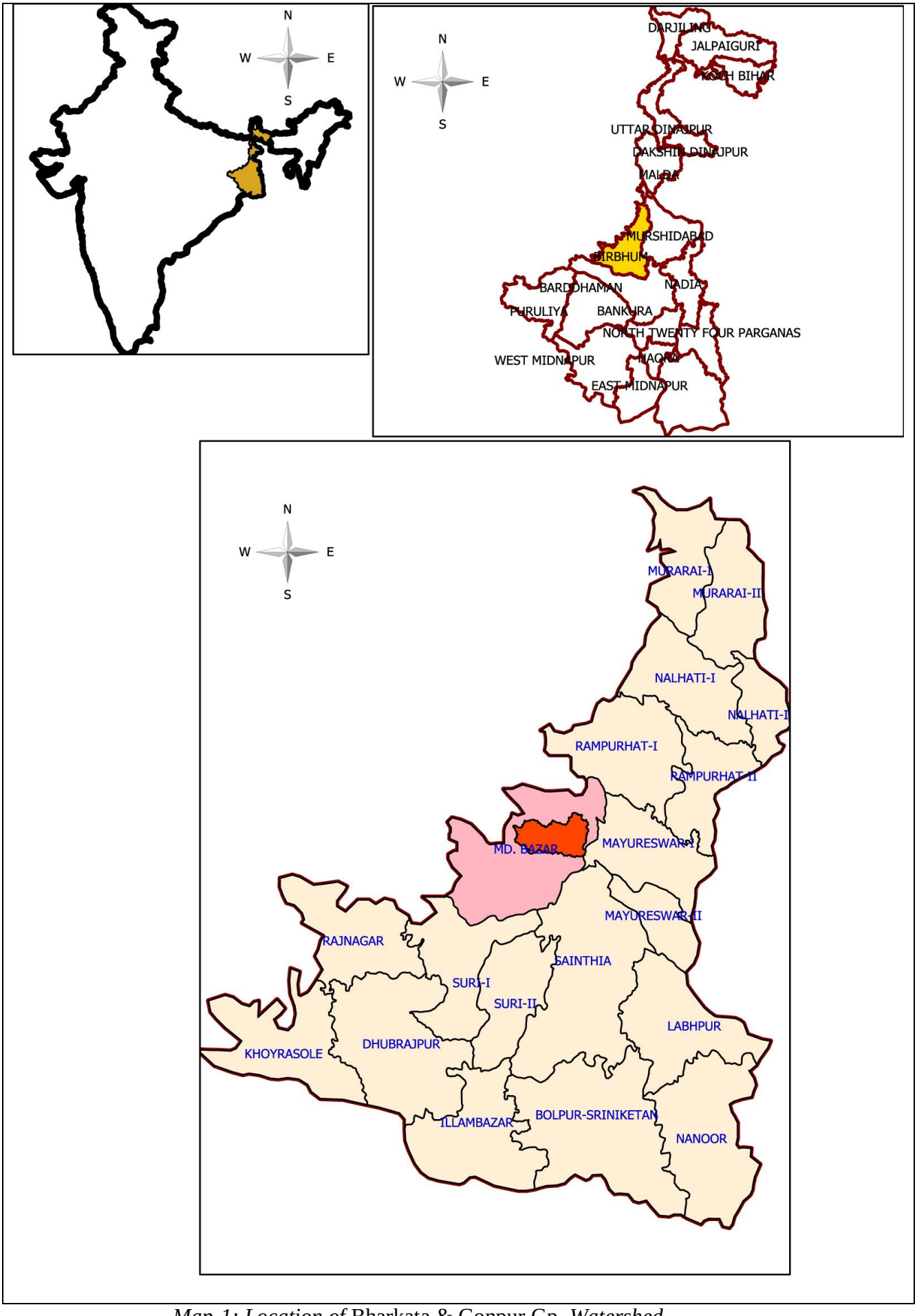
(A) Empowering communities and local governing bodies to spearhead water conservation initiatives.

(B) Facilitating the implementation of meticulously crafted micro-plans, particularly emphasizing water conservation and climate-resilient agricultural practices, to be developed during Phase I.

(C) Engaging with newly elected Panchayat representatives to foster their comprehension of Gram Panchayat Development Plans (GPDP) and their pivotal role in their realization. This entails fortifying and regularizing Gram Sabhas to be held in May, October, and December, while also amplifying the voices of vulnerable groups including women, the elderly, differently-abled individuals, farmers, children, and youth, ensuring their concerns are integrated into overarching community plans.

Study Area

The study area covers 8 revenue villages of Mahammad Bazar Block, Birbhum Dist, West Bengal, India (Map-1). The area is bounded by 24° 7'57.16"N" to 24° 4'13.43"N (from north towards south) northern latitude and 87°34'29.49"E to 87°41'21.56"E" (from west towards east) eastern longitudes, falling in SoI old toposheet nos. 72P/12. The area is situated in eastern side of Rajmahal hills between Dwarka and Brahmani River.



Map-1: Location of Bharkata & Gonpur Gp *Watershed*

There are 27 villages in these 8 revenue villages of two adjacent Gram Panchayats namely; Bharkata and Gonpur. Bharkata GP is in the western side and Gonpur GP is in the Eastern side. As per 2011 Census the total population of these 8 villages is 19442 in which total ST population of Bharkata GP is 60% and Gonpur GP is 49%. Within these two GPs, Hatgacha is the largest village with over 1093 households and around 5557 population with 76% ST population. The smallest village is Kalapahari with over 117 household and around 438 population with 86% ST population.

GP wise the targeted 8 revenue villages distribution is given below;

Gram Panchayat	Revenue Villages	Population (Census 2011)	ST Population
Bharkata	Hatgacha	5557	4247
	Jethia	2681	1964
	Chakraipur	2573	1366
	Haridaspur	2856	694
Gonpur	Moubelia	890	831
	Kalaipahari	438	377
	Ghaga	1351	944
	Damra	3096	723

Following revenue villages are ST Villages with ST population over 50% ; Hatgacha, Jethia, Chakraipu, Moubelia , Kalaipahari, Ghaga

The Watershed

The villages of Bharkata & Gonpur GP are part of the 2 Milli-watersheds (10 to 100 Sq. KM) of Brahmani River catchment area. These 2 Milli-watersheds are in the sub-watershed code C2aBHG36 of Central Water Commission. These are situated in the Brhamani- Dwarka

valley, east of Rajmahal hills. The total area of these 2 Milli-watersheds is around 51.80 sq Km. (Map-2).

These 2 milli-watersheds are of 2 important streams namely

1) Aguyea Kandor in the North and
2) Dudh Kandor in the South

The slope of both of these Milli-watersheds is from West to East. Both of these stream merges towards East near Birajpur village.

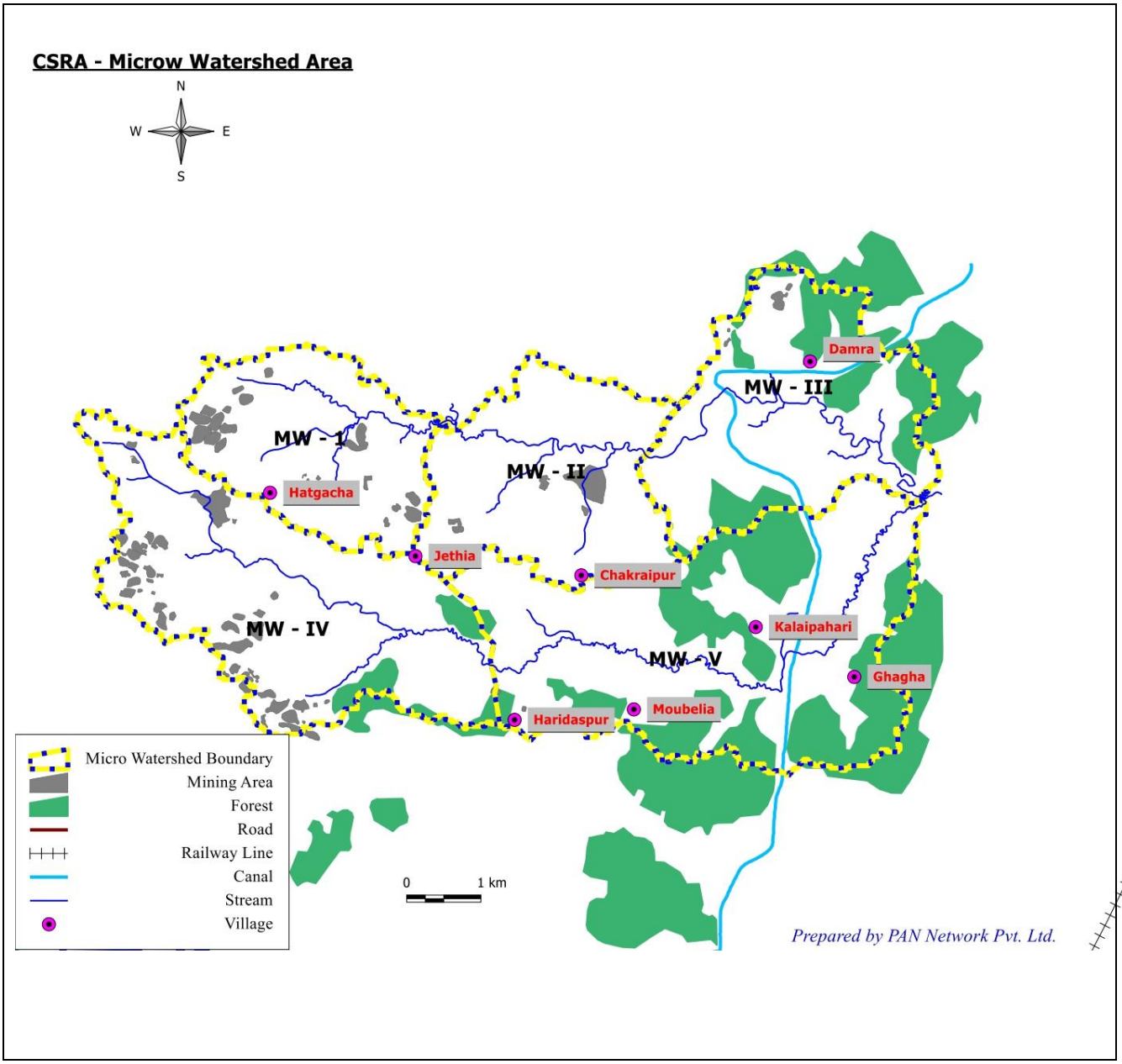
The Northern Milli-watershed is divided into 3 Micro-watersheds from West to East known as MW-1, MW-2, and MW-3.

The Southern Milli-watershed is divided into 2 Micro-watersheds from West to East known as MW-4, and MW-5.

These 27 villages of above two GPs are situated in different Micro-watersheds of these 2 Milli-watershed. The Bharkata GP villages are mainly in the MW-1, MW-2 and MW-4 The Gonpur GP villages are mainly situated in MW-3 and MW-5.

The Rajmahal hills are located in the Western side, the Brahmani River is originating in the west near Rajmahal hills and flowing to the East towards Bhaghirathi. The highest altitude of these two Milli-watershed lies in the Western side, around 115m above msl(Mean Sea Level) and the lowest point is in the Bhaghirathi flood plain in the Eastern side, around 45 m above msl.

A number of Stone mines are present in the western side of the area (Map-2), Gonpur Protected forests are in the Eastern side in East-North corner and Kalaipahari Reserve Forest are in the eastern side.



Map-2: Drainage Pattern & Location of Villages within Watershed Area

A detail planning is required at Micro-watershed level covering individual villages of Micro-watershed for sustainable integrated watershed program.

Climate:

The area enjoys the tropical monsoon type of climate characterized by hot wet summer and cool dry winter. There is a relatively short wet period preceded by a period of comparatively dry spells of long duration. The average annual rainfall is around 1400 mm, the intensity of seasonal monsoon water is high.

During winter, western disturbances generally cause light rainfall. This does not cause any major soil erosion problem. During hot weather season of March to May, rainfall is caused by

the Nor‘westers or Kalbaisakhis. Kalbaishakhis generally bring sudden rainfall with great intensities. Besides, the season in which it occurs is characterized by the presence of bare soil mostly devoid of vegetation. Therefore, it causes considerable amount of soil erosion.

The south west monsoon season sets in about the middle of June and continues up to the end of September. October and the first half of November constitute the post monsoon season. During monsoon from July to Sept. total rainfall is 1072 mm which is 75 % of total annual rainfall.

The cool weather commences in the later part of November and lasts until the middle of February. During these months the prevailing winds are from the north and north east. This is followed by the hot and dry season which extends up to May. Highest temperature is well above 40 °C and and Lowest temperature is around 6 °C.

The average Relative Humidity of Mahammad Bazar Block is around 44%. In summer the weather becomes increasingly hot during the day, though the night remains fairly cool. The daily range of temperature is often tempered by Nor‘westers which generally appears in the evening.

The Terrain

All these 5 Micro-watersheds are part of the Rarh region; the terrain of the western side of the target is undulating in nature but eastern side is mainly plain land. In Western side, high land areas are situated on Raajmahal Trap area, while the eastern side is part of the Gangetic plain. Mainly two sub-division of geomorphology are noticed here –

1) Long stretch of pedi-plain in the west, and,

2) Upper mature deltaic plain

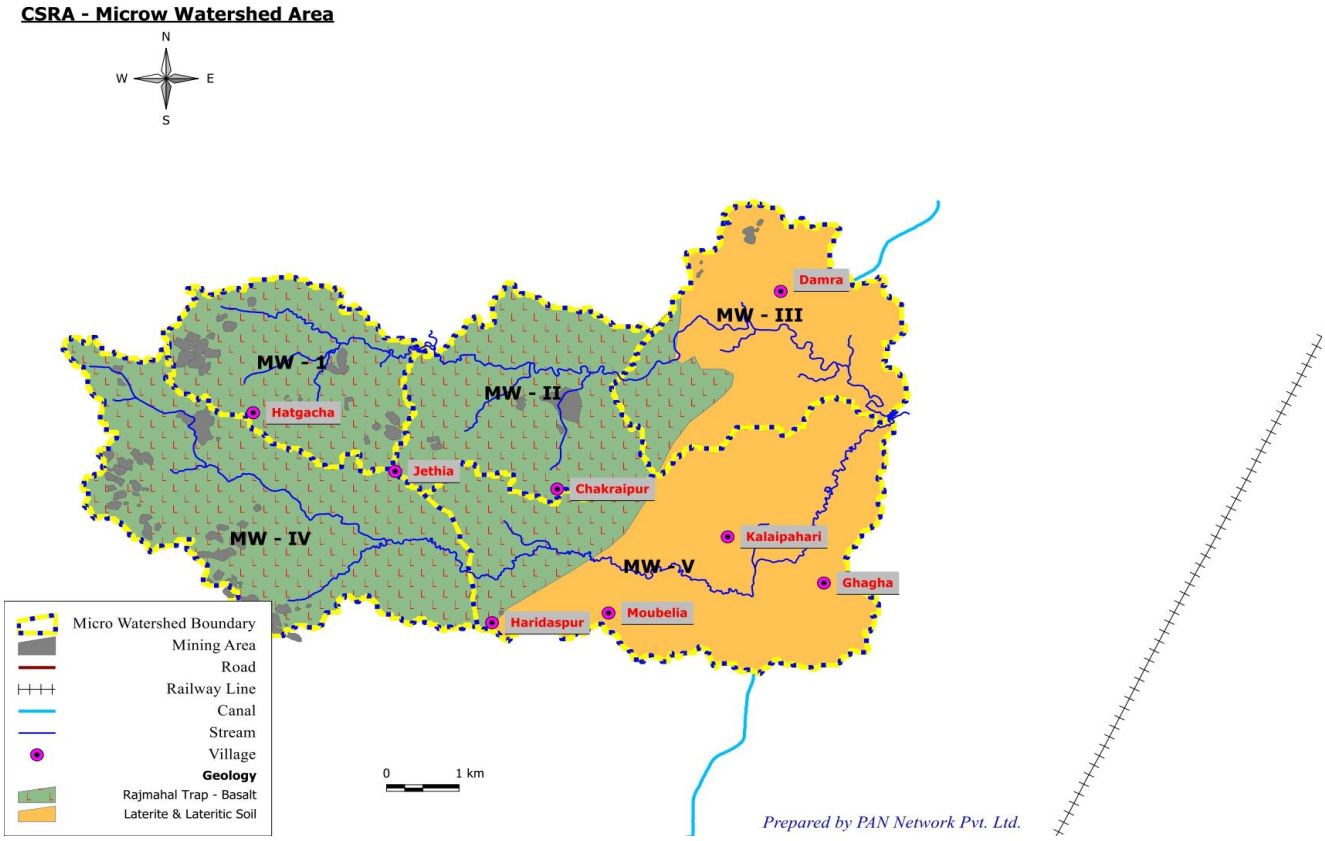
At the western boundary, high ridges capped by laterites and separated by valleys are noticed. But at the south and eastern part, these ridges disappear gradually and valleys become shallow and gradually mixed with the alluvium of indo-gangetic plains. At the Rampurhat subdivision in the north, hills are the extensions of the low Rajmahal hills of basaltic formation. The south of the Bharkata and Gonpur, the land is part of the Gangetic plain. The general gradient is from north-west to south-east. The slope of the target area is less than 1%. Aguyea Kandor in the North and Dudh Kandor in the South, these two streams meander across the flat flood plains. The drainage pattern of the area is Sub-dendritic, governed by the flat topography with horizontal sediments and partly by secondary control of the region. The proportion of the surface and sub-surface water that feeds the streams varies greatly with different season.

Geology

The western part is represented by vast spread of basalt of Rajmahal volcanics. The raajmahal trap rocks are believed to be of Middle Jurassic to Lower Cretaceous age. These volcanic rocks include thick sequence of basalt and inter-trappean sediments including coal deposits. A number of stone quarries mines are present in this area.

In the Eastern part, Laterite and lateritic soil of Cainozoic era is present.

Among 8 revenue villages, Hatgacha, Jethia, Haridaspur, Chakraipur, Moubelia - 5 villages are located in the Rajmahal Trap, Basalt region in the west and the remaining 3 revenue villages Kalaipahari, Damra, Ghagha are located in the laterite and lateritic soil zone in the east.



Map-3 Geology Map

Landuse:

Main land use classes of Mahammad Bazar Block, watershed area cover –

I. Forest,
II. Depleted forest,
III. Settlement,
IV. Road,
V. Surface Water bodies, and
VI. Agriculture land.

The villages of the eastern side, Ganpur Gp are surrounded by tropical Sal forest of Ganpur Reserve Forest (Map-2).

Out of 52 Sq. km watershed area, around 5 sq km is forest area, settlement is around 2 sq km but surface waterbody is less than 1%, Mines 1.5 sq km and Wasteland is around 2 sq km, rest are agricultural land and cultivable waste. Most of the mine areas fall within the raajmahal trap area in the west of the Milli-Watersheds lying in between present MW-1, MW-II and MW-4 and a small number of mine areas also lies within MW-3 (Map-3).
The eastern side Sal forest area is mainly covered with moram or lateritic soil.

Tropical fruit trees namely mango, leafy lemon, tamarind & banana are common in the valley. In the forest Arjun, Mahua, Sal and other trees are available.

Hatgacha, Jethia, Haridaspur, Chakraipur, Moubelia villages are in the Rajmahal Volcanics region having thick soil with vast agricultural land. In this area, due to the presence of underlying Basalt rocks, a number of large stone mines with crushers is present. Many agricultural lands are now converted into stone quarries. Mines and crushers are gradually encroaching the adjacent agricultural land of local villages.

Remaining 3 revenue villages in the East - Kalipahari, Damra and Ghagha are located on the lateritic plains but are relatively favourable for agriculture due to availability of water in the Canal and streams. Most of the lateritic barren lands are present in the ridge areas but in the valley areas, some patches of land along the streams are present with high soil moisture. These lands are suitable for more than one crop due to the availability of water round the year.

The Settlements:

Out of eight villages, the geographic position of the villages are as follows (Map-3) -

Revenue Villages	Geographic Location
Hatgacha	• Western most village in the Aguyea Kandor milli-watershed. • Situated in Rajmahal trap areas of MW-1 with high ST population (76%). • Due to underlying basaltic formation a number of mines are present in and around the village. • Average height is 100m. above msl.
Jethia	• Western most village in the Dudh Kandor milli-watershed. • Situated in Rajmahal trap areas of MW-2 with 73% ST population. • Due to underlying basaltic formation a number of mines are present in and around the village. • Average ht 105m. above msl.
Chakraipur	• Situated in the middle of the area in the Dudh Kandor milli-watershed. • in Rajmahal trap areas of MW-2 with 53% ST population. • Not many mines are present here. • Average height 87 m. above msl.

Haridaspur	• Situated in the south of Dudh Kandor in the middle of this milli-watershed. • Situated partly in laterite zone and partly in the Rajmahal trap areas bordering MW-IV and MW-5 with 24% ST population. • a forest fringe village with agricultural land around it. • Average height 92 m. above msl.
Moubelia	• Situated east of Haridaspur, south of Dudh Kandor milli-watershed. • Situated in laterite zone areas of MW-5 with 93% ST population. • a forest fringe village similar to Haridaspur with agriculture as main occupation here. • Average height 89 m above msl.
Kalaipahari	• An Eastern side village in the Dudh Kandor milli-watershed. • Situated in laterite sal forest area of MW-5 with 86% ST population. • No agricultural land in and around the village. • Average height 84 m above msl

Ghaga	• A forest fringe tribal village situated in laterite zone areas of MW-5 with 69% ST population. • Due to the presence of forest and agricultural land in and around the village, people are dependent on agriculture and forest produce. • Average ht 78 m above msl
Damra	• Eastern most village in the Aguyea Kandor milli-watershed. • Very near to Brahmani canal in MW-3 with 23% ST population. • Due to relatively low altitude, the availability of water is relatively high. • Agricultural land present in and around the village. • Average height 78 m above msl

Villages are having clustered types of settlement structures along the roads.

Livelihood:

Main livelihood of the people is agriculture but presence of large number of stone mines in the west provide livelihood of the local people as mines workers/labourers. Many tribal families are dependent on the eastern side forest for non-timber forest produces.

1) Scarcity of water, lack of irrigation facilities, traditional farming practices and poor soil quality make agriculture non-remunerative.
2) As a consequence of deforestation, many tribal families work in mines as Mines workers.
3) The members of the communities, living in villages of Ghaga, Choubata, Shabla situated inside the forest make a living by selling plates made of sal leaves.

The Water Resource:

As per 2022 CGWB report, in Mahammad Bazar block (in which the target area is present) total rechargeable water is 2500-5000 ha meters and ground water withdrawal is in the category of 0 to 1000 ha meters. The report says on March 2022, phase of ground water extraction by 2022 is 18.51% which is now in safe category.

The average annual rainfall in the area is over 1400 mm, the availability of monsoon water is high. The total area of these 2 mili watersheds receive 74.36 Million cubic metre water from annual precipitation.

The water supply in the western hard rock region is mainly derived from surface water. Dug wells are generally shallow and tap only localized joint and fracture-controlled groundwater bodies. In the lateritic soil zone of eastern side, underlying silt and clay form good storage of groundwater.

The water of both the milli-watersheds flows from west to east as the slope is from west to east. Due to lack of planned water conservation, unplanned mining activities and deforestation the groundwater condition of the area is deteriorating fast.

Dwarka and Brahmani Rivers are mainly connected by a canal which flows from South to North through the forest covered land along which agriculture has developed significantly.

Main drinking water sources are wells and hand pumps. Whereas the level of water in Chowbata village well is 34 feet below the ground and water depth in the well is 14 feet below the water level. This village is in the ridge area of east of Haridaspur in Lateritic Soil zone. Similarly further east, near Moubelia, the water level of Dudh Kandor village large dia well is 19 feet below the ground and the depth of the water from water level is 6 ft. This is in the valley area of Dudh Kandor Milli -Watewrshed. Besides, there is a well located downstream of Dudh Kander Nala.Whereas the water level of Sabla village well is 23.5 feet below the ground and the water depth is 6 feet below the water level.

The number of water bodies for water conservation are very less. Agriculture is the dominant land use landcover of the area. Considering the high water potential in this area, we need to build more water bodies and develop measures to harvest rainwater through Integrated Watershed Management Model.

The abandoned mines and working mines in the west accumulate large quantity of ground water and rain water. The operating mines many a times drain out the accumulated water in both the streams.

Pic-1: Cultivated Land

The Number of natural water body as well as farm pond is very less. As a result the surface runoff is high and water storage is low. This has been resulting low groundwater recharge.

Conclusion:

In conclusion, thorough examination of the challenges and opportunities in the project area spanning across 27 villages within the Bharkata and Gonpur Gram Panchayats of Birbhum District, West Bengal, the initiative, led by CSRA-INDIA and supported by the Paul Hamlyn Foundation, underscores the importance of community empowerment and environmental

sustainability in addressing pressing issues such as water conservation and sustainable development.

The study area, nestled within the Brahmani River catchment area, faces a myriad of challenges including water scarcity, poor soil quality, and traditional farming practices. These challenges are further compounded by factors such as reliance on forest resources and the presence of stone mines, highlighting the need for sustainable integrated watershed management approaches to address these issues.

In spite of sufficient rainfall, runoff is high as very few water conservation structures like pond, reservoir etc. are there and during dry season evapo-transpiration is very high. As a result, there is water scarcity in the area in dry season. The water scarcity will increase in future if immediate integrated watershed management program is not taken up. Main livelihood option of the area is agriculture with poor irrigation infrastructure. High dependence on Groundwater extracted irrigation further impacts the groundwater exploitation and depletion.

By engaging with local communities and governing bodies, the project aims to foster a deeper understanding of water conservation initiatives and empower stakeholders to take proactive steps towards sustainable development. Through micro-planning and integrated watershed management, the project seeks to harness the potential of available resources while mitigating threats posed by deforestation and unplanned water conservation methods.

Moving forward, it is imperative to prioritize the implementation of sustainable practices and infrastructure development to safeguard water resources and enhance the resilience of rural communities. By leveraging local knowledge and expertise, coupled with strategic partnerships and support from relevant stakeholders, the project can achieve its objectives of promoting community empowerment and environmental sustainability.

In essence, the importance of collaborative integrated watershed management program and shared responsibility is necessary in addressing the complex challenges facing the area. With better water management practices agricultural productivity will increase, crop failure will reduce. Double crop area will increase. Through concerted efforts guided by a comprehensive shared vision with two GPs will create lasting impact and foster positive change in the lives of the inhabitants of the area, paving the way towards a more equitable and sustainable future. Regular monitoring of the groundwater condition is necessary for better water management planning.