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Abbreviations

HH	-	Household
INR	-	Institute of Natural Resources
LPCD	-	Litres Per Capita per Day
MBDA	-	Meghalaya Basin Development Authority
MCM	-	Million Cubic Metre
MIG	-	Meghalaya Institute of Governance
SPVS	-	Special Project Vehicle Society
TP	-	Treatment Plant
WHH	-	Women Headed Households
WSS	-	Water Supply Scheme.

Forward

This study was conducted by the Meghalaya Basin Development Authority through its institutions, the Meghalaya Institute of Governance and the Institute of Natural Resources. The recommendations are aimed at augmenting the existing water schemes of various villages within the Shella – Bholaganj C&RD Block so that the residents of the villages receive sufficient water supply for domestic use as well as for other purposes in order to bring about overall sustainable socio-economic improvement in the village.

CHAPTER 1. INTRODUCTION

This feasibility study is meant for the Water Supply Scheme of a number of villages in Shella-Bholaganj C&RD Block, namely Pyrkan, Jasir (Saw Kher), Mustoh, Mawryngkhong, Nongwar, Sohlap and Lai Kher villages to be implemented by the Public Health Engineering Department, Government of Meghalaya under the Special Project Vehicle Society (SPVS) funding.

1. WATER USE IN SHELLA – BHOLAGANJ C&RD BLOCK

Of the total area of Shella – Bholaganj block, 493.7 ha is grossly irrigated while still 4404 ha remains unirrigated or totally rain fed[1].It has a total of 674.37 ha command area, of which 598 is developed while 76.37 ha is undeveloped[2]. 665.37 ha of area in the block is irrigated by government canals[3].Shella – Bholaganj demands 3.00 MCM of water for domestic consumption in 2016 has been projected to grow to 3.29 MCM in 2020[4]. For crop water Shella – Bholaganj Block needs 47.38 MCM in 2016 and is projected to be 49.51 MCM in 2020[5]. Shella – Bholaganj C&RD Block needs 0.18 MCM for livestock activities, and projected to grow to 0.19 MCM in 2020[6]. Its industrial activities demand 0.00344 MCM and projected to grow to 0.004128 MCM in 2020[7].

[1](NABCONS 2017) p. 53
[2] Ibid pp.62-63
[3] Ibid pp.64-65
[4] Ibid p. 69
[5] Ibid p. 73
[6] Ibid p. 75
[7] Ibid pp.78-79

2. OBJECTIVE OF THE STUDY

The objective of the study is to *“examine the feasibility of the proposed project of the PHE Dept. under the SPVS funding.”*

3. RESEARCH METHODS

The research study involved the use of baseline data as well as data collected on the existing water sources in the village. PRA exercise was conducted, including social mapping, resource mapping and seasonality calendar. Physical verification of the proposed water source of each village was conducted. The discharge, altitude, and distance of the water source and that of the village was recorded.

Secondary information and desk research was done prior to the field research. Where ever necessary Census Report (2011), the District Irrigation Plan, East Khasi Hills and the Detailed Project Reports, etc. were referred to.

Table 1 Date of Village Visits

Sl. No.	Name of Village	Date of Visit
1.	Mustoh	23.01.2018 & 26.03.2018
2.	Nongwar	23.01.2018
3.	Laikher	29.01.2018
4.	Mawryngkhong	29.01.2018 & 26.03.2018
5.	Pyrkan	30.01.2018
6.	Jasir	30.01.2018
7.	Sohlap Presbyterian LP School	30.01.2018

CHAPTER 2. SUMMARY OF FINDINGS

The following are the main findings from all villages proposed.

Present Condition of Villages and their WSS'

1. The present water supply in these villages is inadequate to meet the growing needs and demands.

Agriculture and Other Economic Activities

2. Most of the village respondents are involved in agricultural activities except for **Pyrkan village**.
3. The main crops cultivated in the villages is beetle nut, beetle leaf, bay leaf and broom grass.
4. Ninety per cent of the residents of the village of **Pyrkan** are engaged as miners in limestone quarrying.

Proposed WSS

5. All selected water sources occur naturally, in which the discharge varies from pre to post monsoon.

Village Specific Observations

6. In **Pyrkan village** 90 percent of its residents are engaged as miners in limestone quarries. The residents do not practice agriculture as they had leased out their agricultural land.
7. **Pyrkan village** has no PHE WSS. Most of the residents use Umiam River which becomes unusable during the monsoon.
8. **Mustoh village** is a water surplus village.
9. **Mustoh village** has an efficient WSS and has water surplus even during the dry winter months.
10. **Mustoh village** has local laws that prevent tree felling 10 metres from the village water sources which are present in the ***Rikasiam Protected Forest.***

11. Some villages such as **Mawryngkhong village** had PHE water supply till a year ago; however they have not received any PHE water since. They draw water from Umiam River for washing and bathing. For drinking water they have to rely on springs which have very small discharge during the winter season and which are not adequate for the entire village population.

CHAPTER 3. RECOMMENDATIONS

All villages, with the exception of Mustoh village, the team visited – with varying water stress levels do need the proposed WSS prepared by the PHE Dept.

Based on the findings the following are the recommendations proposed.

General Recommendations for all Water Supply Scheme:

Forest Protection

1. An undertaking from the village for taking up afforestation, environment protection and protection of water sources.
2. Protection of the catchment area in and around the source to ensure their sustainability.
3. Alternatively, the Village Durbars may collectively follow the example set up by **Mustoh village** and enact village laws preventing de-forestation near the water sources.
4. Afforestation projects need to be taken up intensely to increase productivity and longevity of the water sources.

Encourage Alternative Crops

5. Encourage the villagers who are currently dependent on broom grass to progressively reduce the acreage of cultivation.
6. Take up plantation of suitable, valuable medicinal and aromatic plants

Protection and Maintenance of Water Sources

7. Tapping of the discharge-water by construction of chambers and collection tanks
8. Being a natural source arising from the sub-surface aquifer, recharging the ground water by means of low cost intervention works, must be carried out simultaneously.

9. Existing water supply under the PHE Dept., to be repaired and maintained.
10. The existing water tanks' storage capacity should be increased.
11. Reservoirs to store surface rainfall during water surplus months should be constructed with appropriate technology.
12. Rain water harvesting techniques should be encouraged as this village has water surplus during the monsoon. In this regard, it is suggested that MBDA/ other line Depts. be involved.
13. Judicious planning for ground water resource development.

Capacity Building

14. Capacity building for certain able village residents who can maintain the water supply units themselves.
15. Capacity building of village residents to re-utilise grey water for other purposes such as in toilets, in kitchen gardens, etc.
16. It is recommended that a Monitoring and Evaluation system be installed to monitor the progress of the project.
17. It is also recommended that a Grievance Redressal Cell be installed to enable stakeholders to come forward with their grievances and to have them redressed in a timely manner.

Miscellaneous

18. Measures should be taken to ensure soil conservation as it was seen that agricultural productivity had dropped in the recent past.
19. Community herbal gardens in all villages according to topography and soil, suitable herbal plants may be introduced.
20. Alternative food grains with higher nutritional content may be introduced such as millets which historically was a major food grain for the people of the region.

Project Specific Interventions for Mustoh WSS

21. As regards to the water surplus village of Mustoh it is recommended that the additional water tank be installed to ensure that there is proper water harvesting for lean periods.
22. During the interaction with the Headman of Mustoh village, he expressed that the village had found a more suitable water source for

the proposed project and wishes that the proposed water source for the Mustoh WSS be shifted from *Umsohduit* to *Umbyrsieh* which has a higher water discharge. This may be taken into consideration before the project is implemented.

Project Specific Interventions for Pyrkan WSS

23. Shifting of the dug well in Pyrkan village to another site so as to prevent it being contaminated by water from the Umiam River.
24. Treatment plants and methods so as to make the water from the Umiam River potable for the residents of the village and serve as an alternative source.

Project Specific Interventions for Laikher WSS

25. In consideration of local sentiments it is recommended that other means, apart from GI pipes be used to draw water from the springs to the main tank.

CHAPTER 4. PYRKAN WATER SUPPLY SCHEME

Pyrkan is a village in the East Khasi Hills District of Meghalaya. It falls in the Shella – Bholaganj C& RD Block. Pyrkan can be located at 25.175748°N and 91.631489° E and at an elevation of 29m. It is a water stressed village and obtains its water from the Umiam River. This untreated water is used for drinking, washing and other activities making the residents susceptible to water borne diseases.

1. PYRKAN VILLAGE DEMOGRAPHY AND HOUSEHOLDS

It has a total number of about 82 households. It has a population of 400 persons; 90% of its population is literate.

2. OCCUPATIONAL PROFILE OF PYRKAN VILLAGE

90% of the residents of Pyrkan village are miners in the limestone quarry. While the remaining population are salaried persons (4%), some are involved in petty business (4%) and non-agricultural labour (2%).

3. EDUCATIONAL PROFILE OF PYRKAN VILLAGE

Table 2 Educational Profile of Pyrkan Village

S No.	Level of education	Population percentage as of 2017
1.	Illiterate	5%
2.	Primary education	20%
3.	Upper primary	20%
4.	Secondary education	10%

5.	Se. secondary education	8%
6.	Graduation	10%
7.	Post-Graduation	1%

4. BASIC FACILITES IN PYRKAN VILLAGE

Table 3 Basic Facilities in Pyrkan Village

Basic Facility		Presence			Distance to closest facility
		Yes	**Nos.**	**No**	
Govt. offices		-	-	✓	Sohlap, 200 m from the village
Community Centre		✓	-	-	
Places of worship		✓	-	-	
School	**Primary**	✓	1	-	
	Secondary	-	-	✓	Disong, 3km from the village
	H. Scndary	-	-	✓	Sohra, 35km from the village
	College	-	-	✓	Sohra, 35km from the village
Anganwadi centre		✓	-	-	
Police station		-	-	✓	PS in Saikarap
PDS		✓	1	-	
Bank		-	-	✓	Sohlap 200 from the village
Medical	**Pharmacy**	-	-	✓	-do-
	Pvt doctor	-	-	✓	-do
	PHC	-	-	✓	-do-
	CHC	-	-	✓	CHC in Ichamati
	Local healer	-	-	✓	Sohlap
Wat	**PHE water**	-	-	-	-
	Springs	-	-	-	-

5. PYRKAN VILLAGE RESOURCE MAP

Table 4 Village Resource Map of Pyrkan Village

S. No.	Village Land Use	Yes/No	Nos	Area (acres)
1.	Reserve Forest	No		
2.	Community forest	Yes	1	
3.	Clan forest	No		
4.	Private forest	Yes	90%HH	
5.	Sacred Grove	No		
6.	Fallow land	No		
7.	Cultivable waste land	Yes		
8.	Land under miscellaneous tree crops	Yes		
9.	Fish pond	No		

6. WATER SOURCES IN PYRKAN VILLAGE

The village of Pyrkan has a PHE WSS which is non-functioning. Apart from the non-functioning WSS, there is a dug well, which is owned by the village itself. Water from this dug well is pumped to two storage tanks which supply water to the village households. This dug well which is near the River Umiam was only used for three years as the dug well was regularly inundated by water from the river Umiam during the monsoon. This has made the water from this dug well unusable. Also the pump and the pipe lines of the dug well have been damaged, thus, the people of the village have started using the water from Umiam River for drinking and other purposes. It was suggested that the existing Dug Well be shifted towards the homestead so as to avoid the possibility of it becoming inundated.

Water from the river Umiam is collected either through a water pump connecting 5 to 6 households with this water. The remaining households collect water manually with buckets. The village of Pyrkan is extremely dependent on the Umiam River for water supply. However, as there are no treatment plants or reservoirs for this water there is a high possibility of contracting water borne diseases. The village of Pyrkan gets water throughout the year from Umiam River however during rainy season it faces scarcity of potable water. This is due to siltation of the river

Table 5 Parameters of Pyrkan Village

Sl. No.	Variable	
1.	Co-ordinates of Village	25.175748° N
		91.631489° E
2.	Elevation of Village	29m
3.	Co-ordinates of Proposed Water Source	25.177582° N
		91.633804° E
4.	Elevation of Water Source	24m
5.	Elevation Difference between Proposed Water Source to Village	-5m
6.	Aerial Distance from Source to Village (kms)	0.32

7. PROPOSED WSS FOR PYRKAN VILLAGE

The new scheme which is proposed to enhance the existing water supply to Pyrkan village is called the *Pyrkan Water Supply Scheme*. The source is Umiam River (25.177582° N and 91.633804° E and at an elevation of 25m) which is about 0.32 from the homestead area.

8. RECOMMENDATIONS FOR PYRKAN WSS

- It is recommended that the WSS for Pyrkan village be installed as the village is water stressed.
- The existing Dug well has remained unused for over a period of time and suggestion were made for digging a new Dug well (about 15feet depth) near the homestead area.
- Treatment plants for the water from the Umiam River.

CHAPTER 5. JASIR WATER SUPPLY SCHEME

Jasir is a village in the East Khasi Hills District of Meghalaya. It falls under the Shella-Bholaganj C&RD Block. Jasir belongs to a confederation of villages called *Saw Kher*. The other villages in this confederation are Duba, Disong, and Jamew. Jasir is located at 25.196859° N and 91.636641° E and is at an elevation of 89m.

For this particular WSS, it is proposed that the WSS be installed in Jasir village while supplying water to all four villages within *Saw Kher*.

1. JASIR VILLAGE DEMOGRAPHY AND HOUSEHOLDS

During the interactions with the village headman it was learnt that the combined population of *Saw Kher* is 545 persons; 246 of which are males and 299 females.

Table 6 Demographic Profile of Saw Kher

Name of Villages	**Jasir**	**Jamew**	**Duba**	**Disong**
Total no of HHs	42	25	15	19
No of female headed HHs	19	8	5	9
Total Population	265	122	75	83
Total Male Population	104	56	40	46
Total female Population	161	66	35	37

2. OCCUPATIONAL PROFILE OF DEWSAW VILLAGE

The residents of Jasir village are agriculturalists who mostly grow beetle nut and beetle leaf, though a few households are involved in animal husbandry.

3. BASIC FACILITES IN JASIR

Table 7 Basic Facilities in Jasir Village

Basic facility		Presence			Distance to closest facility
		Yes	Nos.	No	
Govt. offices		-	-	✓	
Community Centre		✓	1	-	
Places of worship		✓	2	-	
School	**Primary**	✓	2	-	
	Secondary	✓	2	-	
	H. Scndary	-	-	✓	
	College	-	-	✓	
Anganwadi centre		✓	1	-	
Police station		-	-	✓	
PDS		✓	4	-	
Bank		-	-	✓	UCO Bank in Sohlap Village
Medical	**Pharmacy**	-	-	✓	
	Pvt doctor	-	-	✓	
	PHC	✓	-	-	
	CHC	-	-	✓	
	Local healer	✓	4	-	-
Water	**PHE water**	-	-	✓	
	Springs	✓	3	-	-
	Stream	✓	4	-	During the monsoon

4. JASIR VILLAGE RESOURCE MAP

Table 8 Jasir Village Resource Map

S. No.	Village Land Use	Yes/ No	Nos	Area (acres)
1.	Reserve Forest	No	-	-
2.	Community forest	No	1	1 acre
3.	Clan forest	No	-	-
4.	Private forest	Yes	100% HH	-
5.	Sacred Grove	No	-	-
6.	Privately owned water bodies	No	10	-
7.	Community owned water bodies	No	2	-
8.	Fallow land	Yes	-	-
9.	Cultivable waste land	Yes	-	-
10.	Land under miscellaneous tree crops	Yes	-	-

5. WATER SOURCES IN JASIR – SAW KHER

There are already two existing water tanks sponsored by the SPVS. One of these water tanks are in Disong village, and the other one in Duba village. These water tanks supply water to the Jasir Water Supply Scheme. Jasir village is water stressed during the winter months from December to April and during these months they collect water from Umiam River.

Table 9 Parameters of Jasir Village

Sl. No.	Variable	
1.	Co-ordinates of Village	25.196859° N
		91.636641° E
2.	Elevation of Village	89m
3.	Co-ordinates of Proposed Water Source	25.190159° N
		91.637943° E
4.	Elevation of Water Source	51m
5.	Elevation Difference between Proposed Water Source to Village	(-) 38m
6.	Aerial Distance from Source to Village (kms)	0.8 km

6. PROPOSED WSS FOR JASIR VILLAGE

The new WSS is proposed to supply water to Jasir, Jamew, Disong and Duba and is called the *Jasir Water Supply Scheme*. The water source for the proposed water supply scheme is from a spring (25.190159° N and 91.637943° E) found at an elevation of 51 m near the River Umiam. The spring is about 0.8 km away from the village.

7. RECOMMENDATIONS FOR JASIR WSS

- It is recommended that the WSS for Jasir village be installed as the village is water stressed.
- Build capacity of village resident to maintain the WSS themselves as a water pump will need to be installed to draw water from the water source to the water tanks.

CHAPTER 6. MUSTOH WATER SUPPLY SCHEME

Mustoh village located at 25.205865° N and 91.563362˚ E at an elevation of 516 m is a part of the East Khasi Hills District of Meghalaya and falls under the Shella – Bholaganj C&RD Block. It gets water from the PHE WSS as well as from 6 springs in the village. During the winter season it does have water scarcity as the PHE water supply is sufficient to meet its demands. The project proposes to create an additional water tank at Mustoh and to ensure that the existing water tanks are repaired and maintained.

Figure 1 Present Water Source of Mustoh Village

1. MUSTOH VILLAGE DEMOGRAPHY AND HOUSEHOLDS

As per the 2011 census it has a total number of about 104 households. It has a population of 451 persons in which 236 are male and 215 are female.

2. WATER SOURCES IN MUSTOH VILLAGE

Mustoh is a water surplus village which gets water supply from the PHE Department as well as from the 6 springs located in the village. The existing PHE WSS draws its water source from the spring *Umsynrang*. According to the village headman this source is located about 4 kms away from the homestead area.

There are a total of 14 PHE water platforms which are at a distance of 15 -20 metres to each house. out of these 14 water platforms, 9 are still functioning. The PHE Dept. has 6 water storage tanks which are well maintained. The water from the PHE WSS is used for drinking, washing and other domestic consumption.

Table 10 Parameters of Mustoh Village

Sl. No.	Variable	
1.	Co-ordinates of Village	25.205865° N
		91.642084° E
2.	Elevation of Village	516 m
3.	Co-ordinates of Existing Water Source	25.210774° N
		91.647134° E
4.	Elevation of Water Source	639m
5.	Elevation Difference between Water Source to Village	123m
6.	Aerial Distance from Source to Village (kms)	1.2 km

3. PROPOSED WSS AT MUSTOH

The village of Mustoh already has a PHE WSS and surplus water supply. It however lacks proper storage of its surplus water and proposes that an additional water tank be installed. The source of the PHE WSS is from a spring which can be located at 25.210774° N and 91.647134° E at an elevation 639 m. it is 1.2 km away from the village.

During the interaction with the Village Headman of Mustoh on 26th March, 2018, he said that Mustoh wishes to shift the proposed water source from Umsohduit to Umbyrsieh as it has a higher water discharge rate.

4. RECOMMENDATIONS FOR MUSTOH WSS

- It is recommended that the additional Water Tank as part of the already existing Mustoh WSS project be installed and the water platforms be repaired and maintained.
- It is recommended that a survey of the proposed Umbyrsieh Spring be done so as to ascertain its feasibility vis a vis the previously proposed Umsohduid.

CHAPTER 7. NONGWAR WATER SUPPLY SCHEME

Nongwar village (25.217203° N and 91.645618° E) is a village in the East Khasi Hills District of Meghalaya. It falls under the Shella – Bholaganj C& RD Block.

1. NONGWAR VILLAGE DEMOGRAPHY AND HOUSEHOLDS

As per Census 2011 it has a population of 562 out of which 266 are males while 296 are females. During the consultation with the village executive committee it was reported that the population of the village has grown to 1042 persons in which 499 are male and 553 are female as of the year 2017.

2. OCCUPATIONAL PROFILE OF NONGWAR VILLAGE

Residents of Nongwar village are mostly agriculturalist and grow beetle nut and beetle leaf.

3. EDUCATIONAL PROFILE OF NONGWAR VILLAGE

Nongwar village has higher literacy rate compared to the literacy rate of the entire state of Meghalaya. In 2011, literacy rate of Nongwar village was 98.54 % compared to 74.43 % of Meghalaya. In Nongwar male literacy stands at 99.11 % while female literacy rate was 98.03 %.

4. BASIC FACILITES IN NONGWAR VILLAGE

Table 11 Basic Facilities in Nongwar Village

Basic facility		Presence			Distance to closest facility
		Yes	Nos.	No	
Govt. offices		-	-	-	
Community Centre		-	-	-	
Places of worship		-	-	-	
School	Primary	-	-	-	
School	Secondary	-	-	-	
School	H. Sec	-	-	-	
School	College	-	-	-	
Anganwadi centre		✓	2	-	
Police station		-	-	✓	28km
PDS		✓	1	-	
Bank		-	-	✓	28km
Medical	Pharmacy	-	-	✓	-do-
Medical	Pvt doctor	-	-	✓	-do-
Medical	PHC	-	-	✓	Laitkynsew
Medical	CHC	-	-	✓	CHC in Sohra
Medical	Local healer	✓	5	-	
Water	PHE water	✓		-	-
Water	Springs	✓	15	-	-

5. NONGWAR VILLAGE RESOURCE MAPS

Table 12 Nongwar Village Resource Map

S. No.	Village Land Use	Yes/No	Nos.
1.	Reserve Forest	No	
2.	Community forest	Yes	1
3.	Clan forest	No	
4.	Private forest	Yes	90% HH
5.	Sacred Grove	Yes	
6.	Fallow land	No	
7.	Cultivable waste land	Yes	
8.	Land under miscellaneous tree crops	Yes	
9.	Fish pond	Yes	2

6. EXISTING WATER SUPPLY SCHEME IN NONGWAR VILLAGE

The village has access to PHE water. There are also about 15 springs located around the village which are alternative water sources which the residents rely upon to supplement their water needs. These springs are perennial and located at a lower elevation. River Um Lu Lu is about 2kms away from the village. The village is water stressed during the winter months from January to March. Due to growing water needs, the water supply in the village is limited and falls short especially during the post monsoon period.

Table 13 Parameters of Nongwar village

Sl. No.	Variable	
1.	Co-ordinates of Village	25.217203° N
		91.645618° E
2.	Elevation of Village	883m
3.	Co-ordinates of Proposed Water Source	25.216228° N
		91.648666° E
4.	Elevation of Water Source	845m
5.	Elevation Difference between Proposed Water Source to Village	(-) 38m
6.	Aerial Distance from Source to Village (kms)	0.3 kms

Within the area the PHE Department has a total number of two water storage tanks including a filtration and siltation tank. There are about 22 water platforms of which only 20 are functioning. The water is used for drinking and other domestic consumption only. Water from these platforms is collected by buckets during summer season.

7. PROPOSED WSS FOR NONGWAR VILLAGE

The new scheme which is proposed to supply water to Nongwar village is called the *Nongwar Water Supply Scheme*. The source of the proposed water supply scheme is from a spring (25.216228° N and 91.648666° E) at an elevation of 845m. The source is about 0.3 kms from the homestead area of the village.

8. RECOMMENDATIONS FOR NONGWAR WSS

- It is recommended that the WSS be installed in Nongwar village.

CHAPTER 8. MAWRYNGKHONG WATER SUPPLY SCHEME

Mawryngkhong (25.201047° N and 91.631362° E) is a village in the East Khasi Hills District of Meghalaya. It falls in the Shella – Bholaganj C&RD Block and it is an elevation of 68 m. It has a non-functioning PHE WSS.

1. MAWRYNGKHONG VILLAGE DEMOGRAPHY AND HOUSEHOLDS

As per the 2011 census it has a total number of about 49 households. It has a population of 255 persons in which 130 are male and 125 are female. According to the research teams' interaction with the member of the village council it was learnt that there are approximately 60 HHs as of 2017 and it has a total population of 374 persons.

2. OCCUPATIONAL PROFILE OF MAWRYNGKHONG VILLAGE

Residents of Mawryngkhong are mainly agriculturalist who cultivate beetle nut, beetle leaf and other fruits. About 15-20 persons are salaried persons.

3. BASIC FACILITES IN MAWRYNGKHONG VILLAGE

Table 14 Basic Facilities in Mawryngkhong Village

Basic facility		Presence			Distance to closest facility
		Yes	Nos.	No	
Govt. offices		-	-	-	
Community Centre		✓	-	-	
Places of worship		✓	-	-	
School	**Primary**	✓	-	-	
	Secondary	-	-	-	
	H. Sec	-	-	-	
	College	-	-	-	
Anganwadi centre		✓	1	-	
Police station		-	-		
PDS		-	-	-	2 kms
Bank		-	-	✓	28km
Medical	**Pharmacy**	-	-	✓	-do-
	Pvt doctor	-	-	✓	-do-
	PHC	-	-	✓	Laitkynsew
	CHC	-	-	✓	CHC in Sohra
	Local healer	-	-	-	
Water	**PHE water**	✓		-	Non-functioning
	Springs	✓	2	-	-
	River	✓	-	-	Umiam River

4. MAWRYNGKHONG VILLAGE RESOURCE MAPS

Table 15 Mawryngkhong Village Resource Map

S. No.	Village Land Use	Yes/No	Nos.
1.	Reserve Forest	No	
3.	Community forest	No	
3.	Clan forest	No	
4.	Private forest	Yes	90% HH
5.	Sacred Grove	No	
6.	Fallow land	No	
7.	Cultivable waste land	No	
8.	Land under miscellaneous tree crops	No	
9.	Fish pond	No	

5. WATER SOURCES IN MAWRYNGKHONG VILLAGE

Table 16 Parameters of Mawryngkhong Village

Sl. No.	Variable	
1.	Co-ordinates of Village	25.201047° N
		91.631362° E
2.	Elevation of Village	68 m
3.	Co-ordinates of Proposed Water Source	25.206964° N
		91.627235° ° E
4.	Elevation of Water Source	191 m
5.	Elevation Difference between Proposed Water Source to Village	123m
6.	Aerial Distance from Source to Village (kms)	0.8 kms

Mawryngkhong gets water from the Umiam River at present as the PHE water supply scheme in the village is not functioning for the last 1 -2 years as the spring from Nongnong village (water source) has dried up. The water tank and the 4-5 water platforms are in very dilapidated conditions and only the water pipes are in good condition.

Mawryngkhong is divided into 3 localities. Each of these localities are water stressed and have resorted to their own alternative water collection. 2 of these localities share a water source. This water source is from a spring in Nongnong village and is quite far from it. The pipes to collect this water had been paid for by the households in these two localities. However, this water source has an extremely low discharge which disappears every so often. The water from this water source is in itself inadequate to meet basic requirements of the village.

The third locality of Mawryngkhong gets water supply from another spring. However, as this spring is controlled by an individual person, distribution of the water supply to other households is at the mercy of this individual. Hence, not all households get adequate water supply.

Water collected from these springs is used for cooking and drinking. While, water from the Umiam River is used for bathing and washing.

6. PROPOSED WSS AT MAWRYNGKHONG VILLAGE

The new scheme which is proposed to supply water to Mawryngkhong village is called the Mawryngkhong *Water Supply Scheme*. The source of the proposed water supply scheme is from a spring (25.206964° E and 91.627235° N). The source is found at an elevation of 191m and about 0.8 km from the homestead area.

7. RECOMMENDATIONS FOR MAWRYNGKHONG VILLAGE

- It is recommended that the WSS scheme for Mawryngkhong Village be installed as a priority.

CHAPTER 9. SOHLAP PRESBYTERIAN LOWER PRIMARY SCHOOL WATER SUPPLY SCHEME

Sohlap Presbyterian Lower Primary School (25.179006° N and 91.637634° E) is present in Sohlap village, East Khasi Hills District of Meghalaya. This village falls in Shella Community and Rural Development Block. This school was established in the year 1897. As per the findings, Sohlap Presbyterian Lower Primary School has 43 students with only 3 teachers. It falls in the Shella Bholaganj C& RD Block and can be found at an elevation of 48m.

1. EXISTING WATER SUPPLY SYSTEM IN SOHLAP PRESBYTERIAN LP SCHOOL

As reported by a member of the schools' managing committee which also looks after the schools' water supply at present there is no PHE water supply to this school. The School gets water from a spring source located near the road side which is approximately 840 meters away. This water source supplies water not only to the School but also a few households in the village. Water is collected through rusted water pipes. These water pipes are old and needs to be rep laced as the water they carry is also dirty.

The water from this source is not adequate to meet the growing needs of the school children and mid-day meal programme in Sohlap Presbyterian Lower Primary School.

Table 17 Parameters of Sohlap Presbyterian LP School

Sl. No.	Variable	
1.	Co-ordinates of Village	25.179006° N
		91.637634° E
2.	Elevation of Village	48m
3.	Co-ordinates of Proposed Water Source	25.174555° N
		91.638758° E
4.	Elevation of Water Source	61m
5.	Elevation Difference between Proposed Water Source to Village	13 m
6.	Aerial Distance from Source to Village (kms)	0.6 km

2. PROPOSED WSS AT SOHLAP PRESBYTERIAN LP SCHOOL

The new scheme is proposed to enhance the existing water supply to Sohlap Presbyterian Lower Primary School that is located near the road side and at a lower altitude.

The Schools' managing committee proposed that the WSS to the school consist of a water storage tank at the school compound and chamber for the water source in order to refilled water during stressed period.

3. RECOMMENDATIONS FOR SOHLAP PRESBYTERIAN LP SCHOOL

- It is recommended that the WSS be installed for Sohlap Presbyterian LP School.
- As the water supply is intended to meet the needs of the school going children and to support government sponsored schemes such as the Mid-day Meal Scheme it is imperative that the water supply scheme be introduced at the earliest to ensure clean water for children.

CHAPTER 10. LAIKHER WATER SUPPLY SCHEME

Laikher is a confederation of three villages in Shella – Bholaganj C&RD Block of East Khasi Hills District. The three villages that form this confederation are Nongnong, Rymsongkatonor and Nongrum.

1. VILLAGES DEMOGRAPHY AND HOUSEHOLDS

NONGNONG VILLAGE

As per the Census of India (2011), Nongnong has 12 HH with a population of 79 persons of which 39 are males and 40 are females. However, as per the interaction the team had with the Village Secretary on 29th January 2018 there are 20 HHs in Nongnong village. There are only 3 Women Headed Households and approximately about 280-300 people residing in this village.

NONGRUM VILLAGE

As per the Census of India (2011), Nongrum has 16HHs with a population of 81 persons of which 37 are males and 44 are females. However, as per the interaction the team had with the Village Secretary on 29th January 2018 there are 26 HHs in Nongrum village. There are only 3-4 Women Headed Households and only 2 Landless Families in this village. The village has approximately about 130 people residing in it.

RYMSONGKATONOR

As per the Census of India (2011), Rymsongkatonor has 29HHs with a population of 148 persons of which 78 are males and 70 are females. However, as per the interaction the team had with the Village Secretary on 29th January 2018 there are more than 30 HHs in Rymsongkatonor village. There are approximately 9 Women Headed Households and less than 5 Landless Families in this village. The village has approximately about 161 people residing in it.

The following table shows the demographic profile of the villages of Laiker as per the Government of India Census 2011 and from the interactions with village headmen vis a’ vis 2017:

Table 18 Demographic Details of Laikher Vilages

Name of Village	As Per Census 2011				As Per Interaction With Village Headman vis a vis 2017			
	Total No. of HHs	Total Pop	Total Male Pop	Total Female Pop	Total No. of HHs	Total Pop	Landless Fam.	No. of WHH
Nongnong	12	79	39	40	20	280	-	3
Nongrum	16	81	37	44	26	130	2	3-4
Rymsongkatonor	29	148	78	70	30	161	5	30

2. OCCUPATIONAL PROFILE OF LAIKHER VILLAGES

Residents of Nongnong, Nongrum and Rymsongkatonor are mainly agriculturalist though some of them are engaged as labourers. Quite a few are salaried persons and some are involved in collection of non-timber forest produce. The main agricultural products are beetle nut, beetle leaf, pipel, pepper, etc.

Figure 2 Existing WSS in Rymsongkatonor Village

3. EDUCATIONAL PROFILE OF LAIKHER VILLAGES

Table 19Educational Profile of Laikher Villages

S. No.	Level Of Education	Population in Nongnong who are educated till that level	Population in Nongrum who are educated till that level	Population in Rymsongkatonor village who are educated till that level
1.	Illiterate	1%	2%	2
2.	Primary Education	25%	5%	5
3.	Secondary Education	30%	10	10
4.	Sr. Secondary Education	20%	5	20
5.	Graduation	10	10	40

4. BASIC FACILITES LAIKHER VILLAGES

The following tables show the basic facilities available in the three villages of Laikher:

BASIC FACILITIES IN NONGNONG VILLAGE

Table 20 Basic Facilities in Nongnong Village

Basic Facility		Presence		
		Yes	Nos.	No
Govt. Offices		-	-	✓
Community Centre		✓	-	-
Places Of Worship		✓	2	-
School	Primary	✓	1	-
	Secondary	-	-	✓
	H. Secondary	-	-	✓
	College	-	-	✓
Anganwadi Centre		✓	1	-
Police Station		-	-	✓
PDS		-	-	✓
Bank		-	-	✓
Medical	Pharmacy	-	-	✓
	Pvt Doctor	-	-	✓
	PHC	-	-	✓
	CHC	-	-	✓
	Local Healer	-	-	✓
Water Sources	PHE Water	✓	3	-
	Springs	✓	1	-
	Stream	✓	1	-
	River	✓	1	-

BASIC FACILITIES IN NONGRUM VILLAGE

Table 21 Basic Facilities in Nongrum Village

<table>
<tr><th colspan="2" rowspan="2">Basic Facility</th><th colspan="3">Presence</th></tr>
<tr><th>Yes</th><th>Nos.</th><th>No</th></tr>
<tr><td colspan="2">Govt. Offices</td><td>-</td><td>-</td><td>✓</td></tr>
<tr><td colspan="2">Community Centre</td><td>✓</td><td>1</td><td>-</td></tr>
<tr><td colspan="2">Places Of Worship</td><td>✓</td><td>-</td><td>-</td></tr>
<tr><td rowspan="4">School</td><td>Primary</td><td>✓</td><td>1</td><td>-</td></tr>
<tr><td>Secondary</td><td>-</td><td>-</td><td>✓</td></tr>
<tr><td>H. Secondary</td><td>-</td><td>-</td><td>✓</td></tr>
<tr><td>College</td><td>-</td><td>-</td><td>✓</td></tr>
<tr><td colspan="2">Anganwadi Centre</td><td>-</td><td>-</td><td>✓</td></tr>
<tr><td colspan="2">Police Station</td><td>-</td><td>-</td><td>✓</td></tr>
<tr><td colspan="2">PDS</td><td>-</td><td>-</td><td>✓</td></tr>
<tr><td colspan="2">Bank</td><td>-</td><td>-</td><td>✓</td></tr>
<tr><td rowspan="5">Medical</td><td>Pharmacy</td><td>-</td><td>-</td><td>✓</td></tr>
<tr><td>Pvt Doctor</td><td>-</td><td>-</td><td>✓</td></tr>
<tr><td>PHC</td><td>-</td><td>-</td><td>✓</td></tr>
<tr><td>CHC</td><td>-</td><td>-</td><td>✓</td></tr>
<tr><td>Local Healer</td><td>-</td><td>-</td><td>✓</td></tr>
<tr><td rowspan="4">Water Sources</td><td>PHE Water</td><td>✓</td><td>1</td><td>-</td></tr>
<tr><td>Springs</td><td>✓</td><td>1</td><td>-</td></tr>
<tr><td>Stream</td><td>✓</td><td>2</td><td>-</td></tr>
<tr><td>River</td><td>✓</td><td>1</td><td>-</td></tr>
</table>

BASIC FACILITIES IN RYMSONGKATONOR VILLAGE

Table 22 Basic Facilities in Rymsongkatonor Village

Basic Facility		Presence		
		Yes	Nos.	No
Govt. Offices		-	-	✓
Community Centre		-	-	✓
Places Of Worship		-	-	✓
School	Primary	✓	2	-
	Secondary	-	-	✓
	H. Secondary	-	-	✓
	College	-	-	✓
Anganwadi Centre		✓	1	-
Police Station		-	-	✓
PDS		-	-	✓
Bank		-	-	✓
Medical	Pharmacy	-	-	✓
	Pvt Doctor	-	-	✓
	PHC	-	-	✓
	CHC	-	-	✓
	Local Healer	-	-	✓
Water Sources	PHE Water	✓	1	-
	Springs	✓	3	-
	Stream	✓	3	-
	River	✓	1	-

5. LAIKHER VILLAGE RESOURCE MAPS

The following show the village resource maps of the three villages of Laikher:

NONGNONG VILLAGE RESOURCE MAP

Table 23 Nongnong Village Resource Map

S. No.	Village Land Use	Yes/No	Nos	Area (acres)
1.	Reserve Forest	No	-	-
2.	Community Forest	No	-	-
3.	Clan Forest	No	-	-
4.	Private Forest	Yes	100% HHs	-
5.	Sacred Grove	No	-	-
6.	Privately Owned Water Bodies	No	-	-
7.	Community Owned Water Bodies	No	-	-
8.	Fallow Land	No	-	-
9.	Cultivable Waste Land	Yes	-	-
10.	Land Under Miscellaneous Tree Crops	Yes	-	-

NONGRUM VILLAGE RESOURCE MAP

Table 24 Nongrum Village Resource Map

S. No.	Village Land Use	Yes/No	Nos.	Area (acres)
1.	Reserve Forest	No	-	-
2.	Community Forest	No	-	-
3.	Clan Forest	No	-	-
4.	Private Forest	Yes	100% HHs	-
5.	Sacred Grove	No	-	-
6.	Privately Owned Water Bodies	-	-	-
7.	Community Owned Water Bodies	Yes	-	-
8.	Fallow Land	Yes	-	-
9.	Cultivable Waste Land	Yes	-	-
10.	Land Under Miscellaneous Tree Crops	Yes	-	-

RYMSONGKATONOR VILLAGE RESOURCE MAP

Table 25 Rymsongkatonor Village Resource Map

S. No.	Village Land Use	Yes/No	Nos.	Area (acres)
1.	Reserve Forest	No	-	-
2.	Community Forest	No	-	-
3.	Clan Forest	No	-	-
4.	Private Forest	Yes	100% HHs	-
5.	Sacred Grove	No	-	-
6.	Privately Owned Water Bodies	No	-	-
7.	Community Owned Water Bodies	-	-	-
8.	Fallow Land	-	-	-
9.	Cultivable Waste Land	-	-	-
10.	Land Under Miscellaneous Tree Crops	-	-	-

6. EXISTING WATER SOURCES IN LAIKHER VILLAGES

The Laikher villages of Nongnong, Nongrum and Rymsongkatonor have only one PHE WSS. The source of this existing WSS is from a spring in Nongnong. The spring has sufficient water source the whole year through. This WSS comprises of 1 storage tank in Nongnong village; from there water is carried to three distribution tanks located in the three villages of Nongnong, Nongrum and Rymsongkatonor respectively.

These pipelines and water storage tanks are in a dilapidated condition. There are about 3 PHE taps in Nongnong village and 6 PHE taps in Rymsongkatonor village. All 3 PHE taps in Nongnong are functioning; while only 2 PHE taps are functioning in Rymsongkatonor village. The water from the PHE WSS is used for drinking, washing and other domestic purposes.

Apart from this, there are three springs in Laikher which are less than 500 m from the homesteads. The water from these springs is used for domestic purposes. The villages use 2 of these springs when they are short of water. However, the use of GI pipes to draw water directly from this spring is forbidden by the Village Durbar as it had experience earlier that drawing water from the source by GI pipes disrupted the supply entirely. It was believed that the use of GI pipes would make the spring disappear completely.

During the monsoon, the villages face a lot of difficulty in repairing the plastic pipes due to the slippery terrain and as the rain water washes most of the plastic pipes away.

Figure 3 Existing Water Source in Nongrum Village

7. PROPOSED WSS FOR LAIKHER VILLAGES

The shared Water Supply Scheme is sourced from spring called *Umkapiw*. This water source is perennial and has sufficient water discharge to meet the water demands of all three villages. The water from the new source at *Umkapiw* is at a higher elevation.

8. RECOMMENDATIONS FOR LAIKHER WSS

- It is recommended that the WSS be installed in Laikher (Nongnong, Nongrum and Rymsongkatonor) villages.
- It is also recommended, if possible that alternative means of drawing water from the spring be used instead of GI pipes in consideration of the local sentiment.

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