NMHS-Himalayan Institutional Project Grant

NMHS-FINAL TECHNICAL REPORT (FTR)- SUMMARY REPORT

Demand-Driven Action Research and Demonstrations

NMHS Reference No.:	GBPNI/NMHS-2017-18/SG14

Date of Submission:	2	4	1	1	2	0	2	2
	d	**d**	**m**	**m**	**y**	**y**	**y**	**y**

PROJECT TITLE

CONSERVATION OF BIODIVERSITY AND LIVELIHOOD ENHANCEMENT THROUGH COMMUNITY-BASED FOREST MANAGEMENT AND ECOTOURISM IN AND AROUND SUBMERGENCE OF SMALL HYDROPOWER PROJECT

Project Duration: *from* (**01.04.2018**) *to* (**31.03.2021**).

***Submitted to*:**

Er. Kireet Kumar
Scientist 'G' and Nodal Officer, NMHS-PMU
National Mission on Himalayan Studies, GBP NIHE HQs
Ministry of Environment, Forest & Climate Change (MoEF&CC), New Delhi
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***Submitted by*:**

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GENERAL INSTRUCTIONS:

1. The Final Technical Report (FTR) has to commence from the date of start of the Project (as per the Sanction Order issued at the start of the project) till its completion. Each detail has to comply with the NMHS Sanction Order.
2. The FTR should be neatly typed (in Arial with font size 11 with 1.5 spacing between the lines) with all details as per the enclosed format for direct reproduction by photo-offset process. Colored Photographs (4-5 good action photographs), tables and graphs should be accommodated within the report or should be annexed with captions. Sketches and diagrammatic illustrations may also be given giving step-by-step details about the methodology followed in technology development/modulation, transfer and training. Any correction or rewriting should be avoided. Please give information under each head in serial order.
3. Training/ Capacity Building Manuals (with details contents of training programme technical details and techniques involved) or any such display material related to project activities along with slides, charts, photographs should be brought at the venue of the Annual Monitoring & Evaluation (M&E) Workshop and sent at the NMHS-PMU, GBP NIHE HQs, Kosi-Katarmal, Almora 263643, Uttarakhand. In all Knowledge Products, the Grant/ Fund support of the NMHS should be duly acknowledged.
4. The FTR Format is in sync with many other essential requirements and norms desired by the Govt. of India time to time, so each section of the NMHS-FTR needs to duly filled by the proponent and verified by the Head of the Lead Implementing Organization/ Institution/ University.
5. Five (5) bound hard copies of the Project Final Technical Report (FTR) and a soft copy should be submitted to the **Nodal Officer, NMHS-PMU, GBP NIHE HQs, Kosi-Katarmal, Almora, Uttarakhand**.

The FTR is to be submitted into following two parts:

Part A – Project Summary Report

Part B – Project Detailed Report

Following Financial and other necessary documents/certificates need to be submitted along with FTR:

Annexure I	**Consolidated and Audited Utilization Certificate (UC) & Statement of Expenditure (SE)**, including interest earned for the last Fiscal year including the duly filled GFR-19A (with year-wise break-up)
Annexure II	**Consolidated Interest Earned Certificate**
Annexure III	**Consolidated Assets Certificate** showing the cost of the equipment in Foreign and Indian currency, Date of Purchase, etc. (with break-up as per the NMHS Sanction Order and year wise).
Annexure IV	**List of all the equipment, assets and peripherals** purchased through the NMHS grant with current status of use including location of deployment.
Annexure V	Letter of Head of Institution/Department confirming Transfer of Equipment Purchased under the Project to the Institution/Department
Annexure VI	**Consolidated Manpower Certificate** and **Direct Benefit Transfer (DBT) Details** showing the education background, i.e. NET/GATE etc. qualified or not, Date of joining and leaving, Salary paid per month and per annum (with break up as per the Sanction Order and year-wise).
Annexure VII	**Details, Declaration and Refund of any Unspent Balance transferred through Real-Time Gross System (RTGS) in favor of NMHS GIA General**

NMHS-Final Technical Report (FTR)

Demand-Driven Action Research Project

DSL: Date of Sanction Letter

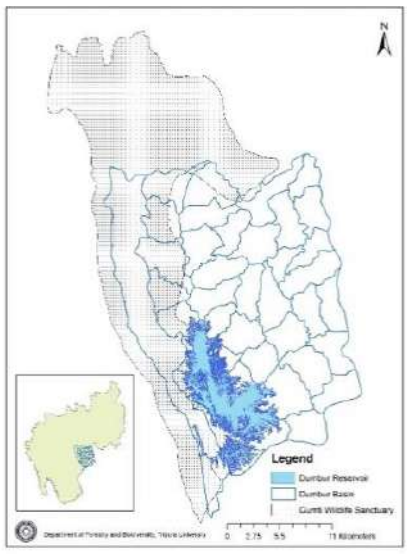
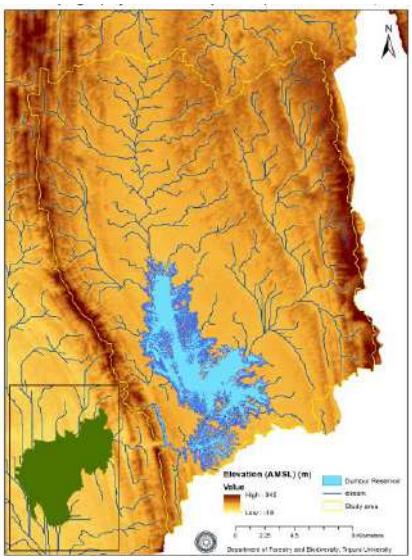
2	8	0	3	2	0	1	8
d	d	m	m	y	y	y	y

DPC: Date of Project Completion

3	1	0	3	2	0	2	1
d	d	m	m	y	y	y	y

Part A: Project Summary Report

1. Project Description

i.	Project Reference No.	NMHS/ 2017-18/ SG39/39						
ii.	Type of Project	**Small Grant**	√	Medium Grant		Large Grant		
iii.	Project Title	Conservation of Biodiversity and Livelihood Enhancement through Community-Based Forest Management and Ecotourism in and around Submergence of Small Hydropower Project						
iv.	State under which Project is Sanctioned	**TRIPURA**						
v.	Project Sites (IHR States covered) (Maps to be attached)	01 TRIPURA  (A) Study area and the Protected area  (B) Topography Map of the area						
vi.	Scale of Project Operation	**Local**	√	Regional		Pan-Himalayan		
vii.	Total Budget/ Outlay of the Project	Rs. 0.437 (in Cr)						
viii.	Lead Agency	Tripura University						

	Principal Investigator (PI)	Dr. Thiru Selvan
	Co-Principal Investigator (Co-PI)	Dr. Sabyasachi Dasgupta
ix.	Project Implementing Partners	Jana Unnayan Samiti Tripura
	Key Persons / Point of Contacts with Contact Details, Ph. No, E-mail	Fr. Jeevan Kennedy, Executive Director Jana Unnayan Samiti Tripura (JUST), Durjoynagar, Airport road, Agartala, West Tripura -799009 Phone: 0381-2917979 Email: justagartala@gmail.com Website: www.justagartala.org

2. Project Outcomes

2.1. Abstract (not more than 500 words) [it should include background of the study, aim, objectives, methodology, approach, results, conclusion and recommendations).

Background

The state of Tripura being the lowest part of Indian Himalayan states is having the unique landscapes features and a very high biodiversity in spite of being heavily populated. Studies on various hydroelectric projects (HEPs) at higher elevation are very common but there is no information available from small HEPs at lower elevation covering a large submergence area.

Objectives/ Aim

The project consists of following objectives:

1. Quantification and mapping of important bioresources of Dumbur HEP catchment.
2. Skill development and livelihood enhancement of tribal and ethnic community living around the submerged area
3. Biodiversity Conservation action through community participation

Methodologies

Grid and transect based survey for different taxonomic group: Quadrat and transect based survey for Plant Resources (Trees, Shrubs, Herbs), PRA, Screening of documentary, Distribution of pamphlets

etc., Hands on training for monitoring of biodiversity components, Popular Talks in schools, panchayat bhawan etc., Snow ball sampling; PRA exercise; identification of potential houses for developing home stay facility, Training the potential family member preferably women. Identification of educated youths preferably persons with multiple language skills. Guide training for bird watching, ecosystem monitoring and narration etc. Forming ecotourism management committee with different stakeholders. Indicator species identification after analysing data collected on biodiversity components.

***Approach**:*

To implement several activities various preparatory actions were identified and framed so as to clarify the role of different organization or individuals involved in the project. Most of the activities such as collection of scientific data, Biodiversity survey, sensitization programme, entrepreneurship development, skill development, conservation initiative etc. was done by Tripura University which was assisted by Jana Unnayan Samiti (JUST), Agartala.

Results:

Checklist of the bioresources cultivated in jhum, home garden, agricultural field or collected from natural sources were documented though Questionnaire based survey and PRA exercise. Three sets of database on Plant diversity, Avifauna and some major faunal species were prepared through transect and quadrat-based analysis. Project intervention has changed the attitude of the local communities and awareness about the conservation of the natural resources was done by conducting sensitization programme like, Screening of documentary, distribution of leaflets and pamphlets, popular talks in schools and villages, PRA exercise etc. PRA exercise resulted in preparation of social map, Resource map and Seasonal calendar of the beneficiary villages. Through skill and entrepreneurship development training one ecotourism facility was started after the selection of the potential households, site, and training the potential family members, local youths for guides etc. The project resulted in developing a model for nature-based ecotourism in one location near the reservoir which can be further developed and replicated as it will bring awareness among the communities.

***Conclusion**:*

Six base maps generated in this project through ArcGIS can be utilized for number of applications based on the need of any researcher, institution, govt. and non-govt. agencies, etc. Data base on natural plant

diversity of herb, shrub and tree species were generated using the standard scientific procedures which is one of the first ever compilation of its type in this area. Our present study also covered listing out of different avifauna present in the study site, their diversity, distribution pattern and also the census of major wildlife population in Gumti Wildlife Sanctuary, Dhalai, Tripura. This will make a way easier and quicker for any researcher to conduct successive research on avifauna and other wildlife such as feeding ecology, nesting ecology, predator and prey relationship, reproductive behavior etc. List of several important bioresources which are cultivated in kitchen garden or in Jhum field, extracted or collected from forest, sold in the market by the local vendors etc. were all listed out and further it is suggested that more extensive research and development can be taken up so that the importance and utility of such resources may be visualized through bioprospecting. Through awareness programmes beneficiary villages were sensitized and attitude of people have been changed which can be seen through their contribution for taking up an ecotourism initiative. Training cum workshop organized for skill development in different aspect of livelihood option has made a way for developing small scale entrepreneurship associated with homestay-based ecotourism. Through the display of documentary videos and other publicity materials the roles of women in all social activities were depicted which has resulted in increasing the number of women participation during the PRA exercise. PRA exercise conducted in beneficiary villages has generated valuable information such as social map, resource map, seasonal calendar etc. This project has contributed directly or indirectly in sustaining ecosystem services, reducing risks and mitigating climate change by ensuring sustainable livelihood to the local communities.

Recommendations

Permanent structure for eco-hut facility can be provided to the community through different govt. schemes. To reduce the anthropogenic pressure on natural forest areas, ecotourism and its associated industries such as handicraft, weaving, poultry, piggery, fishery, farming etc. can also be developed by providing infrastructural supports and value additions. Road connectivity in most of the villages including Raishyabari which is a rural development block under Gandachara sub-division needs to be improved. Lack of frequent electricity with sufficient voltages is one of the major disadvantages in most of the areas of the study site. Dumbur area is one of the most potential areas of ecotourism in the state and government should create a network for livelihood opportunities by developing infrastructures, connecting proper roads and electricity. Moreover, people should have a social mindset of entrepreneur so that they may see the scope and opportunities for ecotourism in a broader prospective.

2.2. Objective-wise Major Achievements

S. No.	Objectives	Major achievements (in bullets points)
1.	Quantification and mapping of important bio resources of Dumbur HEP Catchment.	• 6 base maps were generated with the help of ArcGIS • Baseline information were generated using Secondary literature • Biodiversity information generated through field survey in the study area. • Bioresource information generated through Questionnaire survey at both households and market.
2.	Skill development and livelihood enhancement of tribal and ethnic community living around the submerged area	• Peoples attitude have changed through major Awareness programme and Sensitization Programmes organised. • Skill development and entrepreneurship training cum workshop organised and a means of alternative livelihood opportunity was provided. • PRA Exercises were conducted at 9 beneficiary villages.
3.	Biodiversity Conservation action through community participation.	• 01 location identified and Eco-hut constructed for developing homestay facility. • 01 Website, 01 mobile app, 01 Facebook page and 01 YouTube channel was created for creating awareness among the societies and for Tour Booking facilities.

2.3. Outputs in terms of Quantifiable Deliverables*

S. No.	Quantifiable Deliverables*	Monitoring Indicators*	Quantified Output/ Outcome achieved	Deviations made, if any, & Reason thereof:
1.	• Documentation/	• Monitoring in comparison to	06 base maps were generated with the help of	

	Data base of bioresources HEP catchment;	the baseline information to be provided by the proponent in the 1st Quarter: • No. of New Database/ Datasets/ Maps for the target sites and generated on quantification and mapping status of Bioresources; etc.	ArcGIS; Generation of baseline information Refer Fig. 1, Fig. 2, Fig. 3, Fig. 4, Fig. 5, & Fig. 6 of Annexure-11. 03 Data sets generated on quantification based on floral, faunal and for Carnivore and their prey species Refer Fig. 7, Fig. 8 & Fig. 9 of Annexure-11. Also refer Annexure 1, Annexure 2 and Annexure 3 01 dataset on local Bioresources used by the local communities. Refer Fig. 10 and Fig. 11 Annexure-11. Also refer Annexure 4, 5, 6 & 7	
2.	• Community based Biodiversity conservation model;	• Demonstrative models/ Long-term protocols (No.) *viz*., CPR Management Model; Biodiversity Conservation Action Model and Practices; • No. of Trainings or workshops conducted on Skill Development and Livelihood Generation	Two major Awareness programme organised at Manubakta para and Tarini para. Refer Fig. 12 of Annexure-11. 06 outreach and sensitization programme for Biodiversity Conservation Practices and Model Development practices Refer Fig. 13 & Fig. 14 of Annexure-11. 01 leaflets (in 3 language) and 01 Pamphlets (in 3 language) were prepared and distributed for awareness and publicity. Refer Fig. 15, Fig. 16, Fig. 17, Fig. 18, Fig. 19 & Fig. 20 of Annexure-11.	

			01 professional Training of Forest Officials of Gumti Wildlife Sanctuary. Refer Fig. 21 of Annexure-11 01 workshop cum training programme organised for beneficiaries. Refer Fig. 22 of Annexure-11 Also refer Annexure 8	
3.	• Reduced pressure on protected area and conservation sensitization through ecotourism	• No. of Stakeholders benefitted (No. of Rural Youth, No. of Women, and Total No. of Beneficiaries) including update on income generation (Rs./ person);	01 Ecotourism management Committee was formed with a 43 people of which 10 were rural youth and 06 were women. In addition 60 people were trained of which 20 were youths and 23 were women. Refer Fig. 23 of Annexure-11 Also refer Annexure 9 (Income Generation Activity could not be initiated due to COVID 19 restrictions.	
4.	• Model development for sustainable management of submergence area after the projected life of HEP	• Policy framework/ draft (No.) for Biodiversity Conservation Action Plan through Community Participation; • Other Publications and Knowledge Products (Nos.) on the identified biodiversity indices.	PRA exercise resulted in Biodiversity Conservation Action Plan to derive suitable policy. Refer Fig. 24 of Annexure-11 Also refer Annexure 10 01 General Article, 01 Research Paper & 01 Newsletter was published. Refer Fig. 25, Fig. 26 & Fig. 27 of Annexure-11. 01 Research Paper is under process of publication in a Journals. 01 Travel Guide book under process of publication.	

			01 Website and 01 Mobile App was created Refer Fig. 28 & Fig. 29 of Annexure-11. 01 Documentary video was compiled and released in YouTube. Refer Fig. 30 of Annexure-11. An eco-hut was constructed by the initiative from locals and support from project to carry out ecotourism activities. Refer Fig. 31 of Annexure-11.	

(*) As stated in the Sanction Letter issued by the NMHS-PMU.

2.4. Strategic Steps with respect to Outcomes (in bullets)

S. No.	Particulars	Number/ Brief Details	Remarks/ Attachment
1.	New Methodology developed	01	Model for community based conservation approach
2.	New Models/ Process/ Strategy developed	01 Model / process demonstrated for community-based resource quantification and conservation 01 (one model Eco-hut constructed and developed for income generation through Ecotourism)	Refer Fig. 31 of Annexure-11.

S. No.	Particulars	Number/ Brief Details	Remarks/ Attachment
3.	New Species identified	No published records available for this region due to this being an unexplored region	
4.	New Database established	10 (6 Base maps, 3 Biodiversity data sets and 1 Bioresource data sets)	Refer Fig. 1 to Fig. 6 of Annexure-11 and Annexure 1 to Annexure 4.
5.	New Patent, if any	-	
	I. Filed (Indian/ International)	-	
	II. Granted (Indian/ International)	-	
	III. Technology Transfer (if any)	-	
6.	Others (if any)	One ecotourism site established	Refer Fig. 31 of Annexure-11

3. Technological Intervention

S. No.	Type of Intervention	Brief Narration on the interventions	Unit Details (No. of villagers benefited / Area Developed)
1.	Development and deployment of indigenous technology	One traditional Eco-hut was constructed for the promotion of livelihood avenues through Ecotourism.	43 people benefited. One area developed.
2.	Diffusion of High-end Technology in the region	Workshop, Sensitization, Awareness and PRA was conducted to introduce Ecotourism and sustainable use of resources. It will reduce the pressure in the protected area and improve conservation of biodiversity through people's participation.	350 people were sensitized through different awareness programme. 60 people were given skill development and entrepreneurship training

3.	Induction of New Technology in the region	Concept of Ecotourism and Homestay is completely a new idea of income generation for the region. Replicable ecotourism model can enhance the local economy.	43 people benefited. One area developed.
4.	Publication of Technological / Process Manuals	One Pocket Travel Guide. Production of a leaflet called "Conservation of potential bioresources". It is further translated to Kokborok and Bengali for distribution. Publication of a Pamphlets called "Conservation Tourism". It is further translated to Kokborok and Bengali for distribution.	One pocket travel guide book 3 Leaflets 3 Pamphlets
	Others (if any)		

4. New Data Generated over the Baseline Data

S. No.	New Data Details	Status of Existing Baseline	Additionality and Utilization New data
1.	Six Base maps	There were no pre-existing maps for the specified study area	Land use cover, study area, Protected area, Tree cover, Grid Maps and Topography maps for the study area (Dumbur Basin) was created for scientific use
2.	Three Biodiversity data sets	Pre-existing Biodiversity information was very general representing whole region	Plant diversity database prepared by quadrat methods, Avifauna and some major fauna species database prepared by line transect method and through wildlife census in association with Forest Department
3.	One Bioresource data set	Pre-existing Bioresource information was very general representing whole region	Bioresource database was prepared through Field study, questionnaire survey and PRA exercise

5. Demonstrative Skill Development and Capacity Building/ Manpower Trained

S. No.	Type of Activities	Details with number	Activity Intended for	Participants/Trained			
				SC	**ST**	**Woman**	**Total**
1.	Workshops	01	Livelihood option	Nil	60	23	60
2.	On Field Trainings	09	PRA Exercise	Nil	124	36	124
3.	Skill Development	01	Livelihood option	Nil	60	23	60
4.	Academic Supports	02	Sensitization Programme	Nil	160	84	180
5.	Others (if any) Professional training of Forest officials	02	Training to the Field Staff of Gumti Wildlife Sanctuary Wildlife Census of Gumti Wildlife Sanctuary				20 30
			Total		404	166	474

6. Linkages with Regional & National Priorities (SDGs, INDC, etc)/ Collaborations

S. No.	Linkages /collaborations	Details	No. of Publications/ Events Held	Beneficiaries
1.	Sustainable Development Goal (SDG)	The project has the linkage with SDGs such as, No poverty, Good health & well-being, Gender equality, Decent work & economic growth, Responsible consumption & production, and Climate action etc.	12	14 villages
2.	Climate Change/INDC targets	Sustainable lifestyle is one of the main objectives of the project. This project has the linkage with three most important key elements of India's INDC targets viz., Sustainable lifestyle, Cleaner economic development, and Technology transfer & Capacity building.	12	14 villages

3.	International Commitments	This project is trying to reduce the encroachments and other type of pressure on forests by indigenous communities to reduce the deforestation by providing alternative livelihood generation through Ecotourism which is related to the negotiations of COP 26 (UNCCC) where leaders of more than 100 countries with around 85% of the world's forests agreed to end deforestation by 2030.	12	14 villages
4.	Bilateral engagements	Not applicable	-	-
5.	National Policies	The project aims to Conserve the natural heritage of the country by preserving the remaining natural forests with the vast variety of flora and fauna, which is one of the most important objectives of National Forest Policy 1988.	-	-
6.	Others collaborations	Training programme and wildlife census was collaborated with State Forest Department	01	Forest Officials

7. Project Stakeholders/ Beneficiaries and Impacts

S. No.	Stakeholders	Support Activities	Impacts
1.	Gram Panchayats	• Household Questionnaire survey • Market survey • Sensitization Programme • PRA Exercise	Through the exchange of knowledge an overview of socio-cultural and economic situation was understood. Bioresource information recorded. Attitudinal change was observed in respect to conservation and involvement in various participatory activities such as PRA exercise. Bioresource database acquired.
2.	Govt Departments (Agriculture/	• Training for Forest Officials • JPF assisted during the	Forest officials trained. Conducted Wildlife census of

	Forest)	Wildlife Census of Gumti Wildlife Sanctuary.	Gumti Wildlife Sanctuary. JICA staff assisted during the training of beneficiaries.
3.	Villagers	• Household Questionnaire survey • Market survey • Sensitization Programme • PRA Exercise	Through the exchange of knowledge an overview of socio-cultural and economic situation was understood. Bioresource information recorded. Attitudinal change was observed in respect to conservation and involvement in various participatory activities such as PRA exercise. Bioresource database acquired.
4.	SC Community	Not applicable as SC population is negligible in the study area	Not applicable as SC population is negligible in the study area
5.	ST Community	• Household Questionnaire survey • Market survey • Sensitization Programme • PRA Exercise • Awareness programmes with focus on Livelihood options	Through the exchange of knowledge an overview of socio-cultural and economic situation was understood. Bioresource information recorded. Attitudinal change was observed in respect to conservation and involvement in various participatory activities such as PRA exercise. Bioresource database acquired.
6.	Women Group	• Household Questionnaire survey • Sensitization Programme • PRA Exercise	Participation by the women in different activities was seen to be increased.
	Others (if any)		

S. No	Project stakeholders/ Beneficiaries	Impacts
1.	Rural Communities	Ethnic communities living in the area is very rich in their traditions & culture and they are dependent on the diverse resources available in the forests. Through this project the concept of ecotourism with special focus on Homestay was introduced to them as a model of alternative livelihood option. This model if successful and replicated can have huge impact in the upliftment of the socioeconomic status of

		the locals.
2.	Tourism Industries	This area has number of opportunities to develop tourism sectors due to the rich & diverse' resources, landscape and ethnic communities living around.
3.	Research Institutes	Research institutes can utilize the database created through this project for the further research as most of the data created in this project are new research for the area being an unexplored region.
4.	Government Agencies	Government agencies before implementing any scheme in this area should understand the ground situation and importance of the diverse communities and resources available in the area.
5.	Non-government Agencies	Based on the report of this project NGOs can go for in depth studies to enhance and uplift the livelihood of the ethnic communities living in the area.

8. Financial Summary (Cumulative)

S. No.	Financial Position/Budget Head	Funds Received	Expenditure/ Utilized	% of Total cost
I.	Salaries/Manpower cost	854400	762296	89.22
II.	Travel	275000	160808	58.48
III.	Expendables & Consumables	150000	131596	87.73
IV.	Contingencies	150000	67276	44.85
V.	Activities & Other Project cost	1123400	221283	19.70
VI.	Institutional Charges	200000	200000	100.00
VII.	Equipment	415000	227016	54.70
	Total	**3167800**	**1770275**	55.88
	Interest earned	45619*		
	Grand Total	**3213419**		

*An amount of Rs. 45619 earned from bank interest has been refunded to the funding agency. (Refer Annexure-VII)

Consolidated and audited Utilization Certificate (UC) and Year wise Statement of Expenditure (SE) attached separately, *ref*. **Annexure I.**

9. Major Equipment/ Peripherals Procured under the Project** (if any)

S. No.	Name of Equipment	Cost (INR)	Utilisation of the Equipment after project
1.	GPS (2 No.)	40,120.00	Will be used in the Department of Forestry and Biodiversity, Tripura University for academic activities and Research
2.	Laptop (1 No.)	40,356.00	
3.	Printer (1 No.)	16,399.79	
4.	Scanner (1 No.)	5,679.99	
5.	DSLR Camera (1 No.)	56,400.00	
6.	Binocular (2No.)	12,739.00	
7.	LCD Projector (1No.)	31,899.00	
8.	Pillow for Ecohut (3Nos)	683.00	Support for Eco-huts
9.	Non-Woven Carpet for Ecohut (20m)	6,825.00	
0.	Godrej Mattress Echo for Ecohut (3Nos)	11,400.00	
11.	Crompton Storm- 2 Fan (2Nos)	7,200.00	
12.	Bedsheet for Ecohut	1,533.00	
13.	Construction of Eco-hut	14700.00	

Details provided in **Annexure III &IV.

10. Quantification of Overall Project Progress

S. No.	Parameters	Total (Numeric)	Remarks/ Attachments/ Soft copies of documents
1.	IHR States Covered	*01*	
2.	Project Site/ Field Stations Developed	*01*	
3.	New Methods/ Modeling Developed	*01*	*Ecotourism model developed by creation of Eco-hut by the EMC*
4.	No. of Trainings arranged	*02*	*(1 for beneficiaries and 1 for Forest officials)*
5.	No of beneficiaries attended trainings	*184*	*(60 during Training cum Workshop and 124 during field training through PRA exercise).*
6.	Scientific Manpower Developed (PhD/ M.Sc./JRF/SRF/ RA):	*04*	*(2 JPF and 2 Website developer)*
7.	SC stakeholders benefited	*Nil*	

8.	ST stakeholders benefited	*404*	
9.	Women Empowered	*166*	
10.	No of Workshops Arranged along with level of participation	*10 events involving 180 participants*	*Details attached in **ANNEXURE-8***
11.	On field Demonstration Models initiated	*01* (attach maps about location & photos)	***ANNEXURE-9** and Fig. 31 of **ANNEXURE- 11***
12.	Livelihood Options promoted	*01*	*Fig. 31*
13.	Technical/ Training Manuals prepared	*07*	*Fig. 11 to Fig. 20 of **ANNEXURE- 11***
14.	Processing Units established	-	
15.	No of Species Collected	-	
16.	New Species identified	-	
17.	New Database generated (Types):	*10*	*(6 Base maps, 3 Biodiversity data and 1 Bioresource database)*
	Others (if any)		

11. Knowledge Products and Publications:

S. No.	Publication/ Knowledge Products	*Number*		*Total Impact Factor*	*Remarks/* Enclosures
		National	International		
1.	Journal Research Articles/ Special Issue:	02	01	-	*Fig 25, to 27 of **ANNEXURE- 11***
2.	Book Chapter(s)/ Books:				
3.	Technical Reports				
4.	Training Manual (Skill Development/ Capacity Building)				
5.	Papers presented in Conferences/Seminars				
6.	Policy Drafts/Papers				
7.	Others: Training Resource	06	-		*Fig. 15 to 20 of **ANNEXURE- 11***

12. Recommendation on Utility of Project Findings, Replicability and Exit Strategy

Particulars	Recommendations
Utility of the Project Findings	The findings will be used by the Ministry of Environment Forests and Climate Change, Ministry of Tribal Affairs, Ministry of Rural Development, Ministry of Statistics and Project Implementation Department of Tourism, Department of Revenue, Various research organizations and academic institutions. It will also act as the inputs to policies of conservation.
Replicability of Project	This project is baseline for livelihood generation through community-based forest management and Ecotourism in the area. Such practice can be easily replicable in different IHR region.
Exit Strategy	Under this project a proper network for livelihood generation for indigenous local community through Homestay based ecotourism was developed. An Ecotourism management committee was formed for the monitoring and management. Members of the committee and other stakeholders' who are connected to this were trained for the proper functioning of the system. The committee will charge money for providing accommodation and food which will be added to their income. Beside this the people residing nearby will also be benefited through this system in a way by selling their handicraft items to the tourists, by becoming a tour guide, by using their indigenous cuisine etc. The tourist who visits the area will get to learn about the ethnicity of different communities living in the area. Such type of initiative will impact in knowledge and cultural exchange. This initiative if replicated will have huge impact in enhancing the livelihood by generating avenues of income generation.

(PROJECT PROPONENT/ COORDINATOR)

(Signed and Stamped)

Principal Investigator
NMHS Project
Dept. of Forestry & Biodiversity
Tripura University

2/12/22

(HEAD OF THE INSTITUTION)

(Signed and Stamped)

(Dr. Deepak Sharma)
Registrar
Tripura University

त्रिपुरा विश्वविद्यालय
Tripura University
स्था./ESTD 1987
Tripura
त्रिपुरा

Place: .....
Date: ...../...../.....

Appendix 1 (Financial and other necessary documents)

Annexure-I

Consolidated and Audited
Utilization Certificate (UC) and Statement of Expenditure (SE)

For the Period: 01.04.2018 *to* **31.03.2021**

1.	Title of the project/Scheme/Programme:	Conservation of Biodiversity and Livelihood Enhancement through Community-Based Forest Management and Ecotourism in and around Submergence of Small Hydropower Project
2.	Name of the Principal Investigator & Organization:	**Dr. Thiru Selvan** Assistant Professor, Department of Forestry and Biodiversity, Tripura University, Suryamaninagar, Agartala, Tripura- 799022 Phone: +91-381-2379462 (O); +91-8974236218 (M) E-Mail: tselvan@tripurauniv.in
3.	NMHS-PMU, G.B. Pant National Institute of Himalayan Environment, Kosi-Katarmal, Almora, Uttarakhand Letter No. and Sanction Date of the Project:	GBPNI/NMHS/ 2017-18/ SG14 Dated: 28-03-2018
4.	Amount received from NMHS-PMU, G.B. Pant National Institute of Himalayan Environment, Kosi-Katarmal, Almora, Uttarakhand during the project period (Please give number and dates of Sanction Letter showing the amount paid):	1st Installment: No. GBPNI/NMHS-2017-18/SG-14 dated 28.03.2018- Rs. 1720600.00 2nd Installment: No. GBPNI/NMHS-2017-18/SG-14/617/232/236/359 dated 26.03.2021- Rs. 1447200.00
5.	Total amount that was available for expenditure (Including commitments) incurred during the project period:	Rs. 3167800.00
6.	Actual expenditure (excluding commitments) incurred during the project period:	Rs. 1770275.00
7.	Unspent Balance amount refunded, if any (Please give details of Cheque no. etc.):	Rs. 1397525.00
8.	Balance amount available at the end of the project:	Nil
9.	Balance Amount:	Nil

10.	Accrued bank Interest:	Rs. 45619

Certified that the expenditure of **Rs. 1770275.00 (Rupees Seventeen Lakh Seventy Thousand Two Hundred Seventy Five)** mentioned against Sr. No. 6 was actually incurred on the project/scheme for the purpose it was sanctioned.

Date:

04/9/22

(Signature of Principal Investigator)

Principal Investigator
NMHS Project
Dept. of Forestry & Biodiversity
Tripura University

30.09.22

(Signature of Registrar/ Finance Officer)

Prof. Pralad Debnath
Finance Officer (i/c)
Tripura University
(A Central University)
Suryamaninagar, Tripura (W)

31/10/22

(Signature of Head of the Institution)

(Dr. Deepak Sharma)
Registrar
Tripura University

OUR REF. No.

S. K. Bhaumik & Co.
Chartered Accountant

S.K. BHAUMIK & CO. AGARTALA M. No-051301 FRN-328855E CHARTERED ACCOUNTANT

ACCEPTED AND COUNTERSIGNED

Date:

COMPETENT AUTHORITY
NATIONAL MISSION ON HIMALAYAN STUDIES (GBP NIHE)

Statement of Consolidated Expenditure

[Tripura University]

Statement showing the expenditure of the period from **01.04.2018** *to* **31.03.2021**

Sanction No. and Date : GBPNI/NMHS/ 2017-18/ SG14
Dated: 28-03-2018

1. Total outlay of the project : Rs. 43,70,000.00

2. Date of Start of the Project : 01/04/2018

3. Duration : 3 years

4. Date of Completion : 31/03/2021

a) Amount received during the project period : Rs. 3167800.00

b) Total amount available for Expenditure : Rs. 3167800.00

S. No.	Budget head	Amount received (Rs.)	Expenditure (Rs.)	Amount Balance/ excess expenditure (Rs.)
A.	**Recurring**			
1	Salaries	854400	762296	92104
2	Travel	275000	160808	114192
3	Expendables & Consumables	150000	131596	18404
4	Contingency	150000	67276	82724
5	Activities & other Project cost	1123400*	221283	902117
Sub-Total		**2552800**	**1343259**	**1209541**
B.	**Non-Recurring**			
6	**Permanent Equipment Purchased**	**415000**	**227016**	**187984**
	Purchase of Nikon DSLR Camera		54000	
	LCD Projector		30080	
	Purchase of Garmin GPS		40120	
	Nikon Binocular		12739	

	Laptop lenovo V-130		40356	
	HP laser jet printer		16400	
	Canon Scanner		5680	
	Support for Ecohut		27641	
7	Institutional charges	200000	200000	0
8	**Accrued bank Interest**	**45619 (Bank Interest Accrued Disbursed Back)**	**Nil**	**0**
Sub-Total		**615000**	**427016**	**187984**
9	**Total**	**3167800***	**1770275**	**1397525***

***Rs 45619 (Bank Interest Accrued Disbursed Back)**

Certified that the expenditure of **Rs. 1770275.00 (Rupees Seventeen Lakh Seventy Thousand Two Hundred Seventy Five)** mentioned against Sr. No.9 was actually incurred on the project/ scheme for the purpose it was sanctioned.

Date: 01/09/22 30.09.22 31/8/22

(Signature of Principal Investigator)

Principal Investigator
NMHS Project
Dept. of Forestry & Biodiversity
Tripura University

(Signature of Registrar/ Finance Officer)

Prof. Prallad Debnath
Finance Officer (i/c)
Tripura University
(A Central University)
Suryamaninagar - 799 022 (W).

(Signature of Head of the Institution)

(Dr. Deepak Sharma)
Registrar
Tripura University

OUR REF. No.

ACCEPTED AND COUNTERSIGNED

S. K. Bhaumik & Co.
Chartered Accountant

S. K. BHAUMIK & CO. AGARTALA M.No-051301 FRN-328855E CHARTERED ACCOUNTANT

Date:

COMPETENT AUTHORITY
NATIONAL MISSION ON HIMALYAN STUDIES (GBP NIHE)

Annexure-II

TRIPURA UNIVERSITY
(A Central University)
Agartala, Suryamaninagar
Tripura, India
PIN-799022

Phone : (0381) 237-4805/5355/ 9019
Fax : (0381) 237-5355
website : www.tripurauniv.ac.in
Email: registrar@tripurauniv.ac.in

PAN: AACAT1043M
TAN: SHLT00649F
GSTIN: 16AACAT1043M1Z1

F. No. TU/FIN(357)/(P)/2018-19 Date: 2/11/2022

Interest Earned Certificate

Title of the Twinning Project: Conservation of Biodiversity and livelihood enhancement through community-based forest management and ecotourism in and around submergence of small hydropower project.

Sanction order No. GBPNI/NMHS/2017-18/SG14, dated 28/3/2018

Principal Investigator: Dr. Thiru Selvan, Department of Forestry & Biodiversity, Tripura University

Certified that an amount of **Rs. 45,619/-** (Rupees forty-five thousand six hundred nineteen) has been earned as bank interest in the ongoing NMHS Project during the period from 01/04/2018 to 31/10/2021 and refunded the said amount.

02.11.2022

(Pranay Pal)
(PRANAY PAL)
Assistant Registrar & DDO
Tripura University
Suryamaninagar-799022

Annexure-III

Consolidated Assets Certificate

Assets Acquired Wholly/ Substantially out of Government Grants

(Register to be maintained by Grantee Institution)

1. Name of the Sanctioning Authority: NMHS-PMU, G.B. Pant National Institute of Himalayan Environment, Kosi-Katarmal, Almora, Uttarakhand
2. Sl. No. GBPNI/NMHS/ 2017-18/ SG14 Dated: 28-03-2018
3. Name of Grantee Institution: NMHS-PMU, G.B. Pant National Institute of Himalayan Environment, Kosi-Katarmal, Almora, Uttarakhand
4. No. & Date of sanction order: GBPNI/NMHS/ 2017-18/ SG14 Dated: 28-03-2018
5. Amount of the Sanctioned Grant: Rs. **415000**
6. Brief Purpose of the Grant: Implementing Small Grant project entitled "Conservation of Biodiversity and Livelihood Enhancement through Community-Based Forest Management and Ecotourism in and around Submergence of Small Hydropower Project"
7. Whether any condition regarding the right of ownership of Govt. in the property or other assets acquired out of the grant was incorporated in the grant-in-aid Sanction Order: Yes
8. Particulars of assets actually credited or acquired — Refer Annexure IV
9. Value of the assets as on 31.03.2021 — Rs. **227016**
10. Purpose for which utilised at present — For academic use
11. Encumbered or not — No
12. Reasons, if encumbered — Not Applicable
13. Disposed of or not — No
14. Reasons and authority, if any, for disposal — Not Applicable
15. Amount realised on disposal — Not Applicable

Any Other Remarks: Support for Ecohut (Items purchased amounting to Rs. 27641/-) is handed over to Ecotourism Management Committee constituted by the name "Leinghoihthai" at Tarani para, Gandhachara, Dhalai District

(PROJECT INVESTIGATOR)
(Signed and Stamped)
Principal Investigator NMHS Project Dept. of Forestry & Biodiversity Tripura University

(FINANCE OFFICER)
(Signed and Stamped)
Prof. Prallad Debnath Finance Officer (i/c) Tripura University (A Central University) Suryamaninagar, Tripura
S. K. Bhaumik & Co Chartered Accountar

(HEAD OF THE INSTITUTION)
(Dr. Deepak Sharma) Registrar Tripura University
(Signed and Stamped)

Annexure-IV

List or Inventory of Assets/ Equipment/ Peripherals

S. No.	Name of Equipment	Quantity	Sanctioned Cost	Actual Purchased Cost	Purchase Details
1	GPS	02	Rs. 415000.00	40,120.00	Model/Sr. No. Name/ Bill No. Dated
2	Notebook/ Laptop	01		40,356.00	
3	Printer	01		16,399.79	
4	Scanner	01		5,679.99	
5	Camera	01		56,400.00	
6	Binocular	02		12,739.00	
7	LCD Projector	01		31,899.00	
8	Support for Ecohut	01		27,641.00	

04/9/22

(PROJECT INVESTIGATOR)

(Signed and Stamped)

Principal Investigator
NMHS Project
Dept. of Forestry & Biodiversity
Tripura University

(FINANCE OFFICER)

30.09.22

(Signed and Stamped)

Prof. Prallad Debnath
Finance Officer (i/c)
Tripura University
(A Central University)
Suryamaninagar, Tripura (W).

31/9/22

(HEAD OF THE INSTITUTION)

(Signed and Stamped)

(Dr. Deepak Sharma)
Registrar
Tripura University

S. K. Bhaumik & Co.

Chartered Accountant

S.K. BHAUMIK & CO. AGARTALA M. No-051301 FRN-328855E CHARTERED ACCOUNTANT

Annexure-V

Letter of Head of Institution/Department confirming Transfer of Equipment Purchased under the Project to the Institution/Department

To,

The Convener, Mountain Division
Ministry of Environment, Forest & Climate Change (MoEF&CC)
Indira Paryavaran Bhawan
Jor Bagh, New Delhi-110003

Sub.: Transfer of Permanent Equipment purchased under Research Project titled ""Conservation of Biodiversity and Livelihood Enhancement through Community-Based Forest Management and Ecotourism in and around Submergence of Small Hydropower Project" funded under the NMHS Scheme of MoEF&CC – reg.

Sir/ Madam,

This is hereby certified that the following permanent equipment purchased under the aforesaid project have been transferred to the Implementing Organization/ Nodal Institute after completion of the project:

Sl No.	Particulars	Quantity
1	GPS	02 Nos
2	Notebook/ Laptop	01 Nos
3	Printer	01 Nos
4	Scanner	01 Nos
5	Camera	01 Nos
6	Binocular	02 Nos
7	LCD Projector	01 Nos

Head of Implementing Organization:
Name of the Implementing Organization:
Stamp/ Seal:
Date: 31/10/22

(Dr. Deepak Sharma)
Registrar
Tripura University

Copy to:

1. The Nodal Officer, NMHS-PMU, National Mission on Himalayan Studies (NMHS), G.B. Pant National Institute of Himalayan Environment (NIHE), Kosi-Katarmal, Almora, Uttarakhand-263643

Annexure-V

Letter of Head of Institution/Department confirming Transfer of Equipment Purchased under the Project to the Institution/Department

To,

The Convener, Mountain Division
Ministry of Environment, Forest & Climate Change (MoEF&CC)
Indira Paryavaran Bhawan
Jor Bagh, New Delhi-110003

Sub.: Transfer of Permanent Equipment purchased under Research Project titled **"Conservation of Biodiversity and Livelihood Enhancement through Community-Based Forest Management and Ecotourism in and around Submergence of Small Hydropower Project"** funded under the NMHS Scheme of MoEF&CC – reg.

Sir/ Madam,

This is hereby certified that the following permanent equipment purchased under the aforesaid project have been transferred to the Implementing Organization/ Nodal Institute after completion of the project:

Sl. No.	Particulars	Quantity
1	Non woven Carpet for Ecohut	19 SQMT
2	Pillow for Ecohut	03 Nos
3	Godrej Matress for Ecohut	03 Nos
4	Cromptom Storm-2 Fan for Ecohut	02 Nos
5	Bedsheets for Ecohut	04 Nos

Head of Implementing Organization: Mr. Chaitanya Reang (President)
Name of the Implementing Organization: Leinghoihthai
(Ecotourism Management Committee)
Stamp/ Seal:
Date:

President
LEINGHOIHTHAI
(An Ecotourism Management Committee)
Tarini Para, Gandachara (P.O)
Dhalai District, Tripura-799284, INDIA

Copy to:

1. The Nodal Officer, NMHS-PMU, National Mission on Himalayan Studies (NMHS), G.B. Pant National Institute of Himalayan Environment (NIHE), Kosi-Katarmal, Almora, Uttarakhand-263643

DIRECT BENEFIT TRANSFER (DBT) DETAILS

Scheme Name:	National Mission on Himalayan Studies (NMHS)
Scheme Type:	Central Sector (CS) Grant-in-Aid Scheme
Scheme Code:	NMHS
Category:	Fellowship under Project Grant
Month-Year:	

PRO FORMA FOR DBT DETAILS

University/Institution Name: Tripura University

S#	Position (H-RA, H-JRF/ H-JPF)	Name	DoB*	DoJ*	PI	Research title	Objectives	Study Area, IHR State	Contact details (Complete corresponding address), Mobile No., E-mail ID	Bank details (Account number, IFSC Code)	Emoluments /Fellowship	Aadhaar No.
1.	01-H-JPF	Ms. R Divya	29.11.1993	26.07.2018	Dr Thiru Selvan	Conservation of Biodiversity and Livelihood Enhancement through Community-Based Forest Management and Ecotourism in and around Submergence of Small Hydropower Project	➢ Quantification and mapping of important bio resources of Dumbur HEP Catchment. ➢ Skill development and livelihood enhancement of tribal and ethnic	Tripura	No. 7, Socrates St., Chitlapakkam, Chennai-600064 Mobile: 9790792840 E-Mail: divyabiosci@gmail.com	A/C No.: 20220696733 IFSC Code: SBIN0010480	Rs. 83097	226539610261
2.	01 H-JPF	Mr. Francis H Darlong			Dr Thiru Selvan			Tripura	C/O- H. Darlong Old Darlong Basti, East Kathal charra, Manughat, Dhalai Tripura- 799288 Mobile: 9365934814 Email: francisdarlong5@gmail.com	A/C No.: 20164377017 IFSC Code: SBIN000018	Rs. 184387	360330735481

63.	01 H-JPF	Mr. Kiran K. Murasing	12.07.1994	11.02.2019	Dr Thiru Selvan		community living around the submerged area. ➢ Biodiversity Conservation action through community participation.	Tripura	Shyam Kumar Para, Vill & P.O-North Taibandal, P.S-Melaghar, District- Sepahijala, Tripura-799105 Mobile: 9634872726 Email: murasingkiran@gmail.com	A/C No.: 32589747567 IFSC Code: SBIN0011795	Rs. 496582	46269965876 8
											764066	

Note: For each month, the DBT Details Pro forma dully filled and signed for each Himalayan Fellowship Grant under NMHS must be submitted at finance.nmhspmu2017@gmail.com; nmhspmu2016@gmail.com. *DoB (Date of Birth); DoJ (Date of Joining).

(Authorized Signatory)

(PRANAY PAL)
Assistant Registrar & DDO
Tripura University
Suryamaninagar-799022

TRIPURA UNIVERSITY

(A Central University)
Agartala, Suryamaninagar
Tripura, India
PIN-799022

Phone : (0381) 237-4805/5355/ 9019
Fax : (0381) 237-5355
website : www.tripurauniv.ac.in
Email: registrar@tripurauniv.ac.in

PAN: AACAT1043M
TAN: SHLT00649F
GSTIN: 16AACAT1043M1Z1

F. No. TU/FIN(357)/(P)/2018-19 Date: 14/11/2022

Annexure-VII

Details of Refund of unspent balance & bank interest

Title of the Twinning Project: Conservation of Biodiversity and livelihood enhancement through community-based forest management and ecotourism in and around submergence of small hydropower project.

Sanction order No. GBPNI/NMHS/2017-18/SG14, dated 28/3/2018

Principal Investigator: Dr. Thiru Selvan, Department of Forestry & Biodiversity, Tripura University

Certified that an amount of **Rs. 14,45,731/-** (Rupees fourteen lakhs forty-five thousand seven hundred thirty-one only) has been refunded till now as unspent and bank interest in the ongoing NMHS Project during the period from 01/04/2018 to 31/10/2021 and refunded the said amount. Here is a breakup of refund amount as follows:

Year 2020-21:	Refunded from Non-Recurring head	Rs. 2,15,625/-
	Bank interest (2019-20)	Rs. 43,032/-
	Bank interest (2020-21) (upto December,20)	Rs. 2,587/-
	TOTAL	Rs. 2,61,244/-
Year 2021-22:	Refund from Recurring head	Rs. 10,93,252/-
	Bank interest (20-21)	Rs. 2,587/-
	TOTAL	Rs. 10,95,839/-
Year 2022-23:	Refund from Recurring head	Rs. 43,029/-
	Bank interest (21-22)	Rs. 45,619/-
	TOTAL	Rs. 88,648/-

(D.D.O) 14.11.22

(PRANAY PAL)
Assistant Registrar & DDO
Tripura University
Suryamaninagar-799022

Appendix 2 (Primary and Scientific data)

ANNEXURE-1

Table 1: List of Herb species found during Quadrat sampling

SN	*Species Name*	Family
1	*Thunbergia grandiflora* Roxb.	Acanthaceae
2	*Adiantum caudatum*	Adiantaceae
3	*Achyranthes aspera* L.	Amaranthaceae
4	*Amaranthus spinosus* L.	Amaranthaceae
5	*Chenopodium album L.*	Amaranthaceae
6	*Centilla asiatica*	Apiaceae
7	*Hydrocotyle sibthorpioides* Lam.	Apiaceae
8	*Rauwolfia serpentina*	Apocynacae
9	*Alocasia indica*	Araceae
10	*Amorphophallus bulbifer*	Araceae
11	*Colacasia esculenta*	Araceae
12	*Acmella oleracea* L	Asteraceae
13	*Ageratum conyzoides* L.	Asteraceae
14	*Blumea lanceolaria* (Roxb.) Druce	Asteraceae
15	*Mikania scandens*	Asteraceae
16	*Parthenium hysterophorus L.*	Asteraceae
17	*Spilanthes acmella*	Asteraceae
18	*Spilanthes paniculata*	Asteraceae
19	*Spilanthes radicans*	Asteraceae
20	*Synedrella nodiflora (l.) gaertn*	Asteraceae
21	*Xanthium strumarium* L.	Asteraceae
22	*Diplazium esculentum* (Retz.) Sw.	Athyriaceae
23	*Heliotropium indicum*	Boraginaceae

24	*Ananas comosus*	Bromeliaceae
25	*Buddleja asiatica* Lour.	Buddlejaceae
26	*Commelina paludosa*	Commelinaceae
27	*Floscopa scandens*	Commelinaceae
28	*Cuscuta reflexa*	Convolvulaceae
29	*Evolvulus nummularius* L.	Convolvulaceae
30	*Ipomoea carnea*	Convolvulaceae
31	*Ipomoea heterotricha*	Convolvulaceae
32	*Lepistemon binectariferum* (Wall.) O. Kuntze var.	Convolvulaceae
33	*Merremia vitifolia* (Burm.f.)	Convolvulaceae
34	*Costus speciosus*	Costaceae
35	*Kalanchoe pinnata* (Lam.) Pers.	Crassulaceae
36	*Coccinia grandis*	Cucurbitaceae
37	*Thladiantha calcarata* C.B. Clarke	Cucurbitaceae
38	*Cyperus pilosus* Vahl.	Cyperaceae
39	*Fimbristylis aestivalis* Vahl.	Cyperaceae
40	*Hypolytrum nemorum*	Cyperaceae
41	*Dioscorea bulbifer*	Dioscoreaceae
42	*Dioscorea deltoidea*	Dioscoreaceae
43	*Dioscorea glabra*	Dioscoreaceae
44	*Dioscorea hamiltonii*	Dioscoreaceae
45	*Dioscorea villosa*	Dioscoreaceae
46	Dryopteris affinis	Dryopteridaceae
47	*Polystichum acrostichoides*	Dryopteridaceae
48	*Euphorbia hirta L.*	Euphorbiaceae
49	*Phyllanthus urinaria* L.	Euphorbiaceae
50	*Mimosa pudica*	Fabaceae

51	*Mucuna bracteata* DC.	Fabaceae
52	*Pueraria phaseoloides* (Roxb.) Benth.	Fabaceae
53	*Pueraria tuberosa*	Fabaceae
54	*Senna tora*	Fabaceae
55	*Dicranopteris linearis*	Gleicheniaceae
56	*Curculigo latifolia*	Hypoxidaceae
57	*Curculigo orchioides*	Hypoxidaceae
58	*Curculigo recurvata*	Hypoxidaceae
59	*Mesosphaerum suaveolens*	Lamiaceae
60	*Lindernia antipoda*	Linderniaceae
61	*Lycopodium cernuum*	Lycopodiaceae
62	*Lygodium flexuosum*	Lygodiaceae
63	*Lygodium scandens*	Lygodiaceae
64	*Ammania baccifera* L.	Lythraceae
65	*Melochia corchorifolia*	Malvaceae
66	*Sida acuta*	Malvaceae
67	*Phrynium pubinerve*	Marantaceae
68	*Cyclea barbata* Miers.	Menispermaceae
69	*Tinospora cordifolia*	Menispermaceae
70	*Musa balbisiana*	Musaceae
71	*Musa paradasiaca*	Musaceae
72	*Boerhavia diffusa* L.	Nyctaginaceae
73	*Ludwigia perennis* L.	Onagraceae
74	*Ludwigia prostrata*	Onagraceae
75	*Dendrobium transparens*	Orchidaceae
76	*Cymbidium aloifolium*	Orchidaceae
77	*Oxalis corniculata L.*	Oxalidacece

78	*Argemone mexicana* L.	Papaveraceae
79	*Passiflora foetida*	Passifloraceae
80	*Peperomia pellucida* (L.) Kunth	Piperaceae
81	*Scoparia dulcis L.*	Plantaginaceae
82	*Arundo donax*	Poaceae
83	*Axonopus compressus (Sw.) P.Beauv.*	Poaceae
84	*Cynodon dactylon*	Poaceae
85	*Cyrtococcum oxyphyllum*	Poaceae
86	*Imperata cylindrica* (L.) Raeusch.	Poaceae
87	*Paspalum conjugatum*	Poaceae
88	*Thysanolaena latifolia*	Poaceae
89	*Polygonum hydropiper*	Polygonaceae
90	*Rumex maritimus* L.	Polygonaceae
91	*Rumex nepalensis*	Polygonaceae
92	*Drynaria quercifolia*	Polypodiaceae
93	*Spermacoce latifolia* Aubl	Rubiaceae
94	*Mussaenda erosa*	Rubiaceae
95	*Nelsonia canescens* (Lam.) Spreng.	Scrophulariaceae
96	*Physalis minima*	Solanaceae
97	*Solanum nigrum L.*	Solanaceae
98	*Stemona tuberosa*	Stemonaceae
99	*Cyclosorus unitus* (L.) Ching	Thelypteridaceae
100	*Boehmeria nivea Hook. & Arn.*	Urticaceae
101	*Stachytarpheta australis*	Verbenaceae
102	*Cayratia trifolia*	Vitaceae
103	*Tetrastigma harmandii*	Vitaceae
104	*Vittaria elongata* Sw.	Vittariaceae

105	*Alpinia allughas*	Zingiberaceae
106	*Alpinia malaccensis* (Burm.f.) Rosc.	Zingiberaceae
107	*Curcuma longa*	Zingiberaceae
108	*Curcuma zedoaria*	Zingiberaceae
109	*Globba racemosa*	Zingiberaceae
110	*Etlingera linguiformis*	Zingiberaceae
111	*Zingiber chrysanthum*	Zingiberaceae
112	*Zingiber rubens*	Zingiberaceae

Table 2: List of Shrub species found during Quadrat sampling

SN	*Species Name*	Family
1	*Calotropis gigantea* L.	Apocynaceae
2	*Ervatamia coronaria (Jacq.) Stapf*	Apocynaceae
3	*Chromolaena odorata*	Asteraceae
4	*Meriandra strobilifera*	Asteraceae
5	*Parthenium hysterophorus*	Asteraceae
6	*Combretum indicum*	Combretaceae
7	*Jatropha curcas*	Euphorbiaceae
8	*Manihot esculenta*	Euphorbiaceae
9	*Ricinus communis* L.	Euphorbiaceae
10	*Abrus precatorius* L.	Fabaceae
11	*Cassia occidentalis* L.	Fabaceae
12	*Desmodium triquetrum*	Fabaceae
13	*Desmodium velutinum*	Fabaceae
14	*Flemingia strobilifera* R. Br. ex Ait.	Fabaceae
15	*Mezoneuron cucullatum*	Fabaceae
16	*Mimosa himalayana*	Fabaceae

17	*Senna alata*	Fabaceae
18	*Sesbania cannabina (Retz.) Poir.*	Fabaceae
19	*Clerodendrum indicum*	Lamiaceae
20	*Clerodendrum japonicum*	Lamiaceae
21	*Clerodendrum phillippinum*	Lamiaceae
22	*Clerodendrum viscosum*	Lamiaceae
23	*Clerodendrum wallichii*	Lamiaceae
24	*Leea guineensis G. Don*	Leeaceae
25	*Helixanthera parasitica L. Var.*	Loranthaceae
26	*Microcos peniculata*	Malvaceae
27	*Urena lobata*	Malvaceae
28	*Melastoma melabathricum*	Melastomaceae
29	*Osbekia chinensis* L.	Melastomaceae
30	*Maesa indica* (Roxb.) A. DC.	Myrsinaceae
31	*Calamus heteracanthus*	Palmae
32	*Calamus leptospadix*	Palmae
33	*Bambusa arundinaria*	Poaceae
34	*Bambusa polymorpha*	Poaceae
35	*Bambusa tulda*	Poaceae
36	*Melocanna bacifera*	Poaceae
37	*Ziziphus oenoplia (L.) Miller.*	Rhamnaceae
38	*Chassalia curviflora (Wall.) Thw. var.*	Rubiaceae
39	*Coffea benghalensis* Heyne ex Roem. & Schult.	Rubiaceae
40	*Citrus limon*	Rutaceae
41	*Micromelum integerrimum*	Rutaceae
42	*Solanum torvum*	Solanaceae
43	*Byttneria pilosa* Roxb	Sterculiaceae

44	*Sarcochlamys pulcherrima* (Roxb.) Gaud.	Urticaceae
45	*Lantana camara*	Verbenaceae

Table 3: List of Tree species found during Quadrat sampling

SN	SCIENTIFIC NAME	FAMILY
1	*Alangium chinense*	Alangiaceae
2	*Lannea coromandelica*	Anacardiaceae
3	*Mangifera indica*	Anacardiaceae
4	*Alstonia scholaris*	Apocynaceae
5	*Holarrhena antidysenterica*	Apocynaceae
6	*Trevesia palmata*	Araliaceae
7	*Fernandoa adenophylla*	Bignoniaceae
8	*Oroxylum indicum*	Bignoniaceae
9	*Stereospermum personatum*	Bignoniaceae
10	*Bombax ceiba*	Bombacaceae
11	*Garuga pinnata*	Burseraceae
12	*Protium serratum*	Burseraceae
13	*Trema orientalis*	Cannabaceae
14	*Carica papaya*	Cariaceae
15	*Terminalia bellirica*	Combretaceae
16	*Dillenia indica*	Dilleniaceae
17	*Dillenia pentagyna*	Dilleniaceae
18	*Antidesma ghaesembilla*	Euphorbiaceae
19	*Hevea brasiliensis*	Euphorbiaceae
20	*Jatropha carcus*	Euphorbiaceae
21	*Macaranga denticulata*	Euphorbiaceae
22	*Macaranga peltata*	Euphorbiaceae

23	*Mallotus tetracoccus*	Euphorbiaceae
24	*Sapium baccatum*	Euphorbiaceae
25	*Securinega virosa*	Euphorbiaceae
26	*Albizia chinensis*	Fabaceae
27	*Albizia procera*	Fabaceae
28	*Albizia lebbek*	Fabaceae
29	*Delonix regia*	Fabaceae
30	*Erythrina fusca*	Fabaceae
31	*Parkia speciosa*	Fabaceae
32	*Senna siamea*	Fabaceae
33	*Tamarindus indica*	Fabaceae
34	*Gmelina arborea*	Lamiaceae
35	*Tectona grandis*	Lamiaceae
36	*Careya arborea*	Lecythidaceae
37	*Lagerstroemia microcarpa*	Lythraceae
38	*Lagerstroemia parviflora*	Lythraceae
39	*Microcos paniculata*	Malvaceae
40	*Firmiana colorata*	Meliaceae
41	*Pterospermum acerifolium*	Malvaceae
42	*Sterculia villosa*	Malvaceae
43	*Toona ciliata*	Meliaceae
44	*Anthocephalus cadamba*	Moraceae
45	*Artocarpus chaplasha*	Moraceae
46	*Artocarpus heterophyllus*	Moraceae
47	*Artocarpus lacucha*	Moraceae
48	*Ficus auriculata*	Moraceae
49	*Ficus benghalensis*	Moraceae

50	*Ficus hispida*	Moraceae
51	*Ficus racemosa*	Moraceae
52	*Ficus semicordata*	Moraceae
53	*Streblus asper Lour*	Moraceae
54	*Callistemon linearis*	Myrtaceae
55	*Psidium guajava*	Myrtaceae
56	*Syzygium cuminii*	Myrtaceae
57	*Phyllanthus emblica*	Phyllanthaceae
58	*Ziziphus jujuba*	Rhamnaceae
59	*Mitragyna tubulosa*	Rubiaceae
60	*Aegle marmelos*	Rutaceae
61	*Citrus x sinensis*	Rutaceae
62	*Grewia serrulata*	Tliaceae
63	*Callicarpa arborea Roxb.*	Verbenaceae
64	*Vitex altisima*	Verbenaceae

ANNEXURE-2

Table 4 : List of Birds spotted during Line Transect Survey

SN	SCIENTIFIC NAME	COMMON NAME
1	*Anastomus oscitans*	Asian openbill stork
2	*Sturnia malabarica*	Chesnut tailed starling
3	*Bubulcus ibis*	Cattle egret
4	*Coracias benghalensis*	Indian Roller
5	*Ardea alba*	Great white egret
6	*Acridotheres fuscus*	Jungle Myna
7	*Streptopelia orientalis*	Spotted Dove
8	*Acridotheres tristis*	Common Myna

9	*Oriolus xanthornus*	Black Hooded Oriole
10	*Pycnonotus cafer*	Red vented Bulbul
11	*Copsychus saularis*	Oriental Magpie Robin
12	*Gracupica contra*	Asian Pied Starling
13	*Halcyon smyrnensis*	White throated Kingfisher
14	*Psilopogon lineatus*	Lineated Barbet
15	*Pycnonotus flaviventris*	Black Crested Bulbul
16	*Dicrurus macrocercus*	Black Drongo
17	*Psilopogon asiaticus*	Blue throated Barbet
18	*Dicrurus paradiseus*	Greater Racket tailed Drongo
19	*Spilornis cheela*	Crested Serpent Eagle
20	*Chalcophaps indica*	Emerald Dove
21	*Orthotomus sutorius*	Common TailorBird
22	*Gracula religiosa*	Hill Myna
23	*Psittacula alexandri*	Red breasted Parakeet
24	*Streptopelia tranquebarica*	Red collared Dove
25	*Dicrurus leucophaeus*	Ashy Drongo
26	*Chrysocolaptes lucidus*	Greater Flame backed Wood pecker
27	*Hemiprocne coronata*	Crested Tree swift
28	*Pericrocotus cinnamomeus*	Small Minivet
29	*Eurystomus orientalis*	Dollar Bird
30	*Dendrocitta vagabunda*	Rufous Treepie
31	*Dicrurus hottentottus*	Hair crested Drongo
32	*Upupa epops*	Common Hoopoe
33	*Vanellus indicus*	Red wattlet Lapwing
34	*Artamus fuscus*	Ashy Woodswallow
35	*Eudynamys scolopaceus*	Asian Koel

36	*Glaucidium cuculoides*	Asian Barred Owlet
37	*Pycnonotus jocosus*	Red whiskered Bulbul
38	*Pericrocotus brevirostris*	Short billed Minivet
39	*Lonchura striata*	White rumped Munia
40	*Pernis ptilorhynchus*	Oriental Honey Buzzard
41	*Pandion haliaetus*	Osprey
42	*Lanius cristatus*	Brown Shrike
43	*Pycnonotus atriceps*	Black headed Bulbul
44	*Saxicola caprata*	Pied Bush Chat
45	*Motacilla citreola*	Citrine Wagtail
46	*Dumetia hyperythra*	Tawny bellied Babbler
47	*Lanius schach*	Long tailed Shrike
48	*Merops leschenaulti*	Chesnut headed Bee eater
49	*Chloropsis aurifrons*	Golden fronted Leafbird
50	*Eumyias thalassinus*	Asian Verditer Flycatcher
51	*Microcarbo niger*	Little Coromorant
52	*Merops pusillus*	Little Bee Eater
53	*Columba livia*	Rock Dove
54	*Pellorneum palustre*	Marsh Babbler
55	*Motacilla alba*	White Wagtail
56	*Prinia inornata*	Plain Prinia
57	*Prinia flaviventris*	Yellow Bellied Prinia
58	*Accipiter badius*	Shikra
59	*Chrysophlegma flavinucha*	Greater yellow naped Woodpecker
60	*Centropus sinensis*	Greater Coucal
61	*Bubulcus ibis*	Pond heron
62	*Treron bicinctus*	Orange breasted green Pigeon

63	*Pericrocotus solaris*	Grey Chinned Minivet
64	*Gallus gallus*	Red Junglefowl
65	*Lanius collurio*	Red backed Shrike
66	*Merops orientalis*	Green bee eater
67	*Acritillas indica*	Yellow Browed Bulbul
68	*Arachnothera longirostra*	Little Spider hunter
69	*Dendrocygna javanica*	Lesser whistling Duck
70	*Alcedo atthis*	Common Kingfisher
71	*Ducula aenea*	Green Imperial Pigeon
72	*Ardea purpurea*	Purple Heron

Table 5 : List of Butterflies spotted during Line Transect Survey

SN	SCIENTIFIC NAME	COMMON NAME
1	*Zemeros flegyas*	Punchinello
2	*Neptis mahendra*	Himalayan Sailor
3	*Eurema hecabe*	Common Grass yellow
4	*Sephisa dichroa*	Western Cortier
5	*Junonia atlites*	Grey Pansy
6	*Junonia almanac*	Peacock Pansy
7	*Mycalesis perseus*	Common bush Brown
8	*Ypthinma baldus*	Common fivering
9	*Junonia lemonias*	Lemon pansy
10	*Tanaecia lepidea*	Grey Count
11	*Graphium doson*	Common Jay
12	*Troides Helena*	Common Birdwing
13	*Pachliopta aristolochiae*	Common Rose
14	Delias aganippe	Red spotted Jezebel

15	*Neptis hylas*	Common Sailor
16	*Euploea core*	Common crow
17	*Papilio demoleus*	Northern Lime Swallowtail
18	*Danaus genutia*	Common tiger
19	*Loxura atymnus*	Yamfly

ANNEXURE-3

ABSTRACT OF WILDLIFE POPULATION AS PER THE CENSUS CONDUCTED DURING MARCH 2020

Sl no	Name of Species	Density / km^2	Extrapolated area in km^2	Population in nos	Total estimated population	Remarks
1	Barking Deer	0.892857143	90	80.35714286	80-100	
2	Leopard Cat	1.785714286	190	339.2857143	340-450	Frequently sighted on roads also at night
3	Civet Cat	0.446428571	98	43.75	44-50	
4	Jungle Cat	2.232142857	196	437.5	437-450	Frequently sighted on roads also at night
5	Hollock Gibbon	2.678571429	2	5.357142857	05-11	In two groups
6	Mongoose	0.446428571	75	33.48214286	33-40	
7	Wild Boar	2.232142857	125	279.0178571	280-300	Many indirect evidences are seen in the jhum cultivations

ANNEXURE-4

BIORESOURCES REPORTED FROM MARKET SURVEY

Table 6: Herb Species observed in the nearby markets

SN	*Species Name*	Common/ Local Name	Family	Parts used	Uses
1.	*Amaranthus gracilis* Desf.	Maira	Amaranthaceae	S, L	Vegetables
2.	*Amaranthus spinosus* L.	Danta Maira	Amaranthaceae	S, L	Vegetables

3.	*Amaranthus viridis* L.	Maira Anuwai	Amaranthaceae	S, L	Vegetables
4.	*Chenopodium album*	Bathua Saagh	Amaranthaceae	S, L	Vegetables
5.	*Allium cepa*	Piyas	Amaryllidaceae	B	Spice
6.	*Allium sativum*	Risum	Amaryllidaceae	CL	Spice, Flavour
7.	*Centilla asiatica*	Samsota	Apiaceae	S, L	Vegetables
8.	*Eryngium foetidum* L.	Bilati bakhor,	Apiaceae (Umbelliferae)	SH, L	Flavour
9.	*Trachyspermum roxburghianum*	Khundrupui, Khunjuprwi	Apiaceae	L, SH	Flavour
10.	*Alocasia cucullata*	Biskochu	Araceae	S, R	Vegetables
11.	*Alocasia indica*	Muitu kotor	Araceae	S, R, ST, F	Vegetables
12.	*Alocasia macrorrhiza*	Borkochu	Araceae	S, R	Vegetables
13.	*Amorphophallus bulbifer*	Mui-morong, Batema	Araceae	S, B	Vegetables
14.	*Colacasia esculenta*	Muitu, Dalkochu, Arvi	Araceae	S, R, F, ST	Vegetables
15.	*Colocasia gigantea*	Manai	Araceae	S	Vegetables
16.	*Homalomena aromatica*	Gandrwi, Kamaitru	Araceae	S, R	Vegetables, Medicinal
17.	*Lasia spinosa*	Gantha	Araceae	S, R	Vegetables
18.	*Acmella oleracea* L	Oosundui	Asteraceae	S, L, F	Vegetables, Flavour
19.	*Blumea lanceolaria* (Roxb.) Druce	Barmajhal	Asteraceae (Compositae)	L, SH	Vegetables, Flavour
20.	*Enhydra fluctuans* Lour.	Titiduga	Asteraceae (Compositae)	SH	Vegetables
21.	*Spilanthes acmella* (L.) Murray.	Hukni Ousundwi	Asteraceae (Compositae)	S, L, F	Vegetables, Flavour
22.	*Spilanthes paniculata* Wall. ex DC.	Ousundwi	Asteraceae (Compositae)	S, L, F	Vegetables, Flavour

23.	*Diplazium esculentum* (Retz.) Sw.	Muikoitroi, Muikhunchok, Mui khonte	Athyriaceae	SH	Vegetables
24.	*Basella alba*	Muiphrai, Malabar Spinach	Basellaceae	L, SH, F, FR	Vegetables
25.	*Brassica nigra*	Hoiro, Black Mustard	Brassicaceae	SH, L	Vegetables
26.	*Brassica oleracea* var. capitata	Banda Kopi	Brassicaceae	F	Vegetables
27.	*Brassica oleracea* var. botrytis	Phul kopi	Brassicaceae	F	Vegetables
28.	*Raphanus sativus* (L.) Domin	Mulai, Radish	Brassicaceae	WP	Vegetables
29.	*Ananas comosus*	Omotwi	Bromeliaceae	F	Fruit Eaten
30.	*Polycarpon prostratum* (Forssk.) Aschers & Schweinf.	Bukhate, Jhima	Caryophyllaceae	S, SH, L	Vegetables
31.	*Spinacia oleracea* L.	Palak	Chenopodiaceae	L	Vegetables
32.	*Commelina paludosa*	Toling Yasku	Commelinaceae	SH	Vegetables
33.	*Benincasa hispida* (Thunb.) Cogn.	Khaklu	Cucurbitaceae	S, L, F, FR	Vegetables
34.	*Citrullus lanatus* (Thunb.) Mansf.	Mukfal	Cucurbitaceae	FR	Fruit Eaten
35.	*Coccinia grandis*	Potol, Ivy Gourd	Cucurbitaceae	F	Vegetables
36.	*Gymnopetalum cochinchinensis* (Lour.) Kurz	Potol Kamranga	Cucurbitaceae	F	Vegetables
37.	*Cucumis melo* L	Thaisumu	Cucurbitaceae	F	Fruit & Vegetables
38.	*Cucumis sativus* L.	Sosa	Cucurbitaceae	F	
39.	*Cucurbita maxima* Duch.	Chakumura Kepher	Cucurbitaceae	S, L, SH, F, FR	Vegetables
40.	*Cucurbita moschata* (Duch.) Poir.	Chakumura kolok	Cucurbitaceae	S, L, SH, F, FR	Vegetables
41.	*Lagenaria siceraria* (Molina) Standley	Muilok, Tilok	Cucurbitaceae	S, L, SH, F, FR	Vegetables

42.	*Luffa acutangula* (L.) Roxb.	Zinga	Cucurbitaceae	SH, FR	Vegetables
43.	*Luffa cylindrica or Luffa aegyptiaca*	Phoro, Pholo	Cucurbitaceae	SH, FR	Vegetables
44.	*Momordica charantia* L.	Gangla	Cucurbitaceae	SH, FR	Vegetables
45.	*Momordica cochinchinensis* (Lour.) Spreng.	Khetoni kangro	Cucurbitaceae	FR	Vegetables
46.	*Momordica dioica* Roxb. ex Willd.	Bolongni Kangro	Cucurbitaceae	FR	Vegetables
47.	*Thladiantha calcarata* C.B. Clarke	Samprama	Cucurbitaceae	SH	Vegetables
48.	*Trichosanthes anguina* L.	Puitha	Cucurbitaceae	FR	Vegetables
49.	*Dioscorea alata*	Tha Kwchak, Purple Yam	Dioscoreaceae	T	Vegetables
50.	*Dioscorea hamiltonii* Hook.f.	Tha-kun	Dioscoreaceae	T	Vegetables
51.	*Dioscorea glabra* Roxb.	Susungra	Dioscoreaceae	T	Vegetables
52.	*Dioscorea villosa*	Tha Bolong	Dioscoreaceae	T	Vegetables
53.	*Dioscorea deltoidea*		Dioscoreaceae	T	Vegetables
54.	*Arachis hypogaea* L.	Badam,	Fabaceae (Papilionaceae)	SD	Eaten
55.	*Canavalia gladiata*	Baikang	Fabaceae (Papilionaceae)	FR	Vegetables
56.	*Dolichos lablab* L.	Masingni Kosoi, Winter beans	Fabaceae	L, FR	Vegetables
57.	*Psophocarpus tetragonolobus* (L.) DC.	Kamranga kosoi	Fabaceae	FR	Vegetables
58.	*Vigna unguiculata (L.)* Walp.	Subai	Fabaceae	FR, SD	Vegetables
59.	*Elsholtzia blanda Benth. / Elsholtzia griffithii*	Muilok banda	Lamiaceae	L, SH	Vegetables, Flavour
60.	*Ocimum basilicum* L	Banda	Lamiaceae (Labiatae)	L, SH	Medicinal

61.	*Aloe barbadensis*	Aloe vera	Liliaceae	L	Medicinal
62.	*Abelmoschus manihot* (L.)	Sikam Muirimi	Malvaceae	FR	Vegetables
63.	*Corchorus capsularis*	Pat, Jute	Malvaceae	S	Fibre
64.	*Hibiscus sabdariffa* L.	Khuni-mukhui, Anthur	Malvaceae	SH, FR	Vegetables
65.	*Phrynium pubinerve*	Lairu	Marantaceae	L, SH	Vegetables
66.	*Musa paradasiaca*	Thailik	Musaceae	S, F, FR	Fruit & Vegetables
67.	*Musa balbisiana*	Bolong thailik (Tangpui)	Musaceae	S, F, FR	Fruit & Vegetables
68.	*Musa spp.*	Anaji Thailik	Musaceae	S, F, FR	Vegetables
69.	*Nymphaea nouchali Burm.f*	Sampla bokong	Nymphaeaceae	S	Vegetables
70.	*Sesamum indicum* L.	Siping	Pedaliaceae	SD	Vegetables & Spice
71.	*Piper betel* L.	Phatwi	Piperaceae	L	Eaten
72.	*Piper nigrum* L.	Gulmorich	Piperaceae	SD	Spice
73.	*Cymbopogan citratus*	Soingmandar	Poaceae	L	Tea, Scent
74.	*Imperata cylindrica* (L.) Raeusch.	Soin	Poaceae	L	Roof making
75.	*Oryza sativa*	Bedi Mai (Variety)	Poaceae	SD	Main Food
76.	*Oryza sativa*	Maimi watlok (Variety)	Poaceae	SD	Main Food
77.	*Oryza sativa*	Maimi (Variety)	Poaceae	SD	Main Food
78.	*Saccharum officinarum*	Sugarcane, Kwruk	Poaceae	S	Eaten
79.	*Saccharum species*	Masinga	Poaceae	S	Juice
80.	*Thysanolaena latifolia*	Noksi	Poaceae	SH	Broom
81.	*Zea mays*	Moka, Mokadam	Poaceae	FR	Vegetables, Popcorn
82.	*Monochoria vaginalis* (Burm. F.)	Chichiri, Kechurwi	Pontederiaceae	SH	Vegetables

83.	*Monochoria hastate*	Chichiri, Kechurwi	Pontederiaceae	SH	Vegetables
84.	*Capsicum annuum* L.	Thamso	Solanaceae	FR	Spice
85.	*Solanum lycopersicum*	Tomato	Solanaceae	FR	Vegetables
86.	*Solanum melongena* L.	Phantok, Brinjal	Solanaceae	FR	Vegetables
87.	*Solanum tuberosum*	Aloo	Solanaceae	T	Vegetables
88.	*Alpinia allughas (nigra)*	Therai	Zingiberaceae	S	Vegetables
89.	*Alpinia malaccensis* (Burm.f.) Rosc.	Biring	Zingiberaceae	S	Vegetables
90.	*Curcuma domestica/ Curcuma longa*	Sotwi, Kormo	Zingiberaceae	WP	Vegetables, Medicinal, Spice
91.	*Curcuma amada*	Bolongni Sortwi Bubar	Zingiberaceae	WP	Vegetables, Medicinal, Spice
92.	*Etlingera linguiformis*	Biring	Zingiberaceae	S	Vegetables
93.	*Zingiber officinale*	Haiching, Ginger	Zingiberaceae	WP	Vegetables, Medicinal, Spice

Note:
B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber and WP = Whole Plant

Table 7: Shrub Species observed in the nearby Markets

SN	Name of species	Common/ Local Name	Family	Part used	Uses
1.	*Ananas comosus*	Omotwi	Bromeliaceae	F	Fruit eaten
2.	*Manihot esculenta*	Thaborchuk	Euphorbiaceae	R	Vegetables, Eaten boiled
3.	*Acacia pennata*	Muikambuk	Fabaceae (Mimosaceae)	SH	Vegetables
4.	*Caesalpinia pulcherrima* L.	Krishna Chora	Fabaceae (Mimosaceae)	F	Ornamental
5.	*Cajanus cajan*	Khokleng	Fabaceae (Papilionaceae)	FR, SD	Vegetables

6.	*Gossypium arboreum* L.	Khul	Malvaceae	FR	Cotton
7.	*Gossypium hirsutum* L.	Khul	Malvaceae	FR	Cotton
8.	*Calamus leptospadix*	Rai	Palmae (Arecaceae)	S	Fibre, Handicraft
9.	*Calamus heteracanthus*	Rai	Palmae (Arecaceae)	S	Fibre, Handicraft
10.	*Bambusa balcooa*	Washur, Barak	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
11.	*Bambusa bambos*	Washur busu, Kanta barak	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
12.	*Bambusa polymorpha*	Parwa	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
13.	*Bambusa tulda*	Wandal	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
14.	*Bambusa spp.*	Wamlang	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
15.	*Dendrocalamus longispathus*	Wamilik	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
16.	*Melocanna bacifera*	Wathwi, Muli	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
17.	*Schizostachyum dullooa*	Watlok Dulu	Poaceae	SH, S, RZ	Vegetables, Construction, Weaving, Handicraft
18.	*Ziziphus oenoplia* (L.) Miller.	Boroi	Rhamnaceae	FR	Eaten
19.	*Citrus limon*	Lemon	Rutaceae	FR, L	Juice, Flavour
20.	*Citrus macroptera*	Satokra	Rutaceae	FR, L	Juice, Flavour
21.	*Solanum aethiopicum*	Sikam Khamkha	Solanaceae	FR	Vegetables
22.	*Solanum torvum*	Khamkha	Solanaceae	FR	Vegetables

23.	*Solanum indicum*	Khamkha	Solanaceae	FR	Vegetables

Note:
B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber and WP = Whole Plant

Table 8: Tree species observed in the nearby local markets

SN	Name of the species	Common/ Local Name	Family	Part used	Uses
1.	*Mangifera indica*	Thaichuk	Anacardiaceae	FR	Fruit eaten, Pickle
2.	*Spondias pinnata*	Thaistwi	Anacardiaceae	FR	Fruit eaten, Pickle
3.	*Spondius dulcis*	Aamra	Anacardiaceae	FR	Fruit eaten, Pickle
4.	*Trevesia palmata* Roxb.	Chapok	Araliaceae	F, FR	Vegetables
5.	*Oroxylum indicum* L.	Tokharung	Bignoniaceae	FR	Vegetables
6.	*Protium serratum* (Wall. ex Colebr.) Engl.	Thaisrem	Burseraceae	FR	Fruit eaten
7.	*Carica papaya* L.	Kokiya, Kengkiya	Caricaceae	FR	Fruit eaten
8.	*Garcinia cowa* Roxb.	Kok, Akau	Clusiaceae	FR	Fruit eaten
9.	*Terminalia chebula* Retz.	Bakhla	Combretaceae	FR	Fruit eaten, Medicinal
10.	*Dillenia indica*	Thaiplo	Dilleniaceae	FR	Fruit eaten, Pickle
11.	*Dillenia pentagyna*	Mandul buthai	Dilleniaceae	FR	Fruit eaten
12.	*Elaeocarpus serratus*	Jolpui	Elaeocarpaceae	FR	Fruit eaten, Pickle
13.	*Parkia speciosa*	Waikre	Fabaceae	FR	Vegetables
14.	*Sesbania grandiflora* (L.) Poiret	Bokul	Fabaceae	F	Vegetables
15.	*Tamarindus indica*	Thentrwi,	Fabaceae	FR	Fruit eaten

		Tamarind			
16.	*Artocarpus heterophyllus*	Thaipong	Moraceae	FR	Vegetables, Ripe Fruit eaten
17.	*Ficus semicordata*	Khuichang	Moraceae	FR	Ripe Fruit eaten
18.	*Moringa oleifera*	Sejna	*Moringaceae*	FR, F, L	*Vegetables*
19.	*Psidium guajava*	Goyam	Myrtaceae	FR	Fruit eaten
20.	*Syzygium cuminii*	*Jam*	Myrtaceae	FR, S	Ripe Fruit eaten, Timber, Fire wood
21.	*Averrhoa carambola* L.	Kamranga	Oxalidaceae	FR	Fruit eaten
22.	*Areca catechu*	Kuwai	Palmae (Arecaceae)	FR	Fruit eaten
23.	*Cocos nucifera*	Narikra	Palmae (Arecaceae)	FR	Fruit eaten
24.	*Phyllanthus acidus* L.	Al Boroi, Leheri,	Phyllanthaceae	FR	Fruit eaten
25.	*Phyllanthus emblica* L.	Amlai	Phyllanthaceae	FR	Fruit eaten
26.	*Ziziphus jujuba*	Boroi	Rhamnaceae	FR	Fruit eaten
27.	*Ziziphus mauritiana* Lamk.	Boroi	Rhamnaceae	FR	Fruit eaten
28.	*Citrus x sinensis*	Komla	Rutaceae	FR	Fruit eaten
29.	*Aegle marmelos*	Bel	Rutaceae	FR	Fruit eaten
30.	*Citrus maxima*	Jambora	Rutaceae	FR	Fruit eaten
31.	*Zanthoxylum panamense*	Muicheng	Rutaceae	L	Vegetables, Flavour

Note:

B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber and WP = Whole Plant

ANNEXURE- 5

BIORESOURCES COLLECTED BY VILLAGERS FROM FOREST

Table 9: Herb Species reported to be collected by villagers from Forest

SN	Species Name	Common/ Local Name	Family	Parts used	Uses
1.	*Amaranthus spinosus* L.	Danta Maira	Amaranthaceae	S, L	Vegetables
2.	*Amaranthus viridis* L.	Maira Anuwai	Amaranthaceae	S, L	Vegetables
3.	*Chenopodium album*	bathua or bathuwa	Amaranthaceae	S, L	Vegetables
4.	*Centilla asiatica*	Samsota	Apiaceae	S, L	Vegetables
5.	*Alocasia cucullata*	Biskochu	Araceae	S, R	Vegetables
6.	*Alocasia indica*	Muitu kotor	Araceae	S, R, ST, F	Vegetables
7.	*Amorphophallus bulbifer*	Mui-morong, Batema	Araceae	S, B	Vegetables
8.	*Colacasia esculenta*	Muitu, Dalkochu, Arvi	Araceae	S, R, F, ST	Vegetables
9.	*Homalomena aromatica*	Gandrwi, Kamaitru	Araceae	S, R	Vegetables, Medicinal
10.	*Acmella oleracea* L	Osundui	Asteraceae	S, L, F	Vegetables, Flavour
11.	*Blumea lanceolaria* (Roxb.) Druce	Barmajhal	Asteraceae (Compositae)	L, SH	Vegetables, Flavour
12.	*Enhydra fluctuans* Lour.	Titiduga	Asteraceae (Compositae)	SH	Vegetables
13.	*Eupatorium triplinerve* Vahl.	Sogorem kwchak	Asteraceae (Compositae)	L, SH	Medicinal
14.	*Spilanthes acmella* (L.) Murray.	Hukni Ousundwi	Asteraceae (Compositae)	S, L, F	Vegetables, Flavour
15.	*Spilanthes paniculata* Wall. ex DC.	Osundwi	Asteraceae (Compositae)	S, L, F	Vegetables, Flavour

16.	*Spilanthes radicans*	Osundwi Kuphur	Asteraceae (Compositae)	S, L, F	Vegetables, Flavour
17.	*Diplazium esculentum* (Retz.) Sw.	Muikoitroi, Muikhunchok, Mui khonte	Athyriaceae	SH	Vegetables
18.	*Polycarpon prostratum* (Forssk.) Aschers & Schweinf.	Bukhate, Jhima	Caryophyllaceae	S, SH, L	Vegetables
19.	*Commelina paludosa*	Toling Yasku	Commelinaceae	SH	Vegetables
20.	*Cuscuta reflexa* Roxb.	Swarnolota	Convolvulaceae	SH, L	Vegetables
21.	*Coccinia grandis*	Potol, Ivy Gourd	Cucurbitaceae	F	Vegetables
22.	*Gymnopetalum cochinchinensis* (Lour.) Kurz	Potol Kamranga	Cucurbitaceae	F	Vegetables
23.	*Luffa cylindrica or Luffa aegyptiaca*	Phoro, Pholo	Cucurbitaceae	SH, FR	Vegetables
24.	*Momordica dioica* Roxb. ex Willd.	Bolongni Kangro	Cucurbitaceae	FR	Vegetables
25.	*Thladiantha calcarata* C.B. Clarke	Samprama	Cucurbitaceae	SH	Vegetables
26.	*Dioscorea hamiltonii* Hook.f.	Tha-kun	Dioscoreaceae	T	Vegetables
27.	*Dioscorea glabra* Roxb.	Susungra	Dioscoreaceae	T	Vegetables
28.	*Dioscorea villosa*	Tha Bolong	Dioscoreaceae	T	Vegetables
29.	*Dioscorea deltoidea*	Tha	Dioscoreaceae	T	Vegetables
30.	*Bauccauria ramiflora* Lour	Kusumai	Euphorbiaceae	F	Fruit
31	*Ocimum sanctum*	Tulsi	Lamiaceae (Labiatae)	L, SH	Medicinal
32.	*Phrynium pubinerve*	Lairu	Marantaceae	L, SH	Vegetables
33.	*Tinospora cordifolia*	Bduboyeih, Dumakme, Duksa songdari	Menispermaceae	S	Medicinal
34.	*Musa balbisiana*	Bolong thailik (Tangpui)	Musaceae	S, F, FR	Fruit & Vegetables

35.	*Boerhavia diffusa* L.	Punarnava	Nyctaginaceae	L, SH	Vegetables
36.	*Nymphaea nouchali* Burm.f	Sampla	Nymphaeaceae	S	Vegetables
37.	*Passiflora foetida*	B'Duk Thaitop	Passifloraceae	FR	Fruit
38.	*Imperata cylindrica* (L.) Raeusch.	Soin,	Poaceae	L	House Construction
39.	*Thysanolaena latifolia*	Noksi	Poaceae	SH	Broom
40.	*Monochoria vaginalis* (Burm. F.)	Chichiri, Kechurwi	Pontederiaceae	SH	Vegetables
41.	*Monochoria hastate*	Chichiri, Kechurwi	Pontederiaceae	SH	Vegetables
42.	*Physalis minima*	Thaitop	Solanaceae	FR	Fruit
43.	*Alpinia allughas (nigra)*	Therai	Zingiberaceae	S	Vegetables
44.	*Alpinia malaccensis* (Burm.f.) Rosc.	Biring	Zingiberaceae	S	Vegetables
45.	*Curcuma amada*	Bolongni Sortwi (Bubar Gulapi)	Zingiberaceae	WP	Vegetables, Medicinal, Spice
46.	*Curcuma zedoaria*	Sotwi gulapi	Zingiberaceae	WP	Vegetables, Medicinal, Spice
47.	*Etlingera linguiformis*	Biring	Zingiberaceae	S	Vegetables

Note:
B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber and WP = Whole Plant

Table 10: Shrub Species reported to be collected by villagers from Forest

SN	Name of species	Common/ Local Name	Family	Part used	Uses
1.	*Cassia occidentalis*	Muitati	Fabaceae	L, SH	Vegetables
2.	*Calamus leptospadix*	Rai	Palmae (Arecaceae)	S	Fibre, Handicraft

3.	*Calamus heteracanthus*	Rai	Palmae (Arecaceae)	S	Fibre, Handicraft
4.	*Bambusa tulda*	Wandal	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
5.	*Dendrocalamus longispathus*	Wamilik	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
6.	*Melocanna bacifera*	Wathwi	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
7.	*Schizostachyum dullooa*	Watlok Dulu	Poaceae	SH, S, RZ	Vegetables, Construction, Weaving, Handicraft
8.	*Ziziphus oenoplia* (L.) Miller.	Boroi	Rhamnaceae	FR	Eaten
9.	*Solanum torvum*	Khamkha	Solanaceae	FR	Vegetables
10.	*Solanum indicum*	Khamkha	*Solanaceae*	FR	Vegetables

Note:
B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber and WP = Whole Plant

Table 11: Tree species reported to be collected by villagers from forest

SN	Name of the species	Common/ Local Name	Family	Part used	Uses
1.	*Spondias pinnata*	Thaistwi	Anacardiaceae	FR	Fruit eaten, Pickle
2.	*Trevesia palmata* Roxb.	Chapok	Araliaceae	F, FR	Vegetables
3.	*Oroxylum indicum* L.	Tokharung	Bignoniaceae	FR	Vegetables
4.	*Bombax ceiba*	Borchuk Tula	Bombacaceae	F, FR	Vegetables, Cotton
5.	*Protium serratum* (Wall. ex Colebr.)	Thaisrem	Burseraceae	FR	Fruit eaten

	Engl.				
6.	*Garcinia cowa* Roxb.	Kok, Akau	Clusiaceae	FR	Fruit eaten
7.	*Terminalia bellirica*	Dedaluk, Dedagui	Combretaceae	FR	Fruit eaten, Medicinal
8.	*Terminalia chebula* Retz.	Bakhla	Combretaceae	FR	Fruit eaten, Medicinal
9.	*Dillenia indica*	Thaiplo	Dilleniaceae	FR	Fruit eaten, Pickle
10.	*Dillenia pentagyna*	Mandul bphang	Dilleniaceae	FR	Fruit eaten
11.	*Macaranga peltata* Roxb. Mueller.	Laichak, Laichrok	Euphorbiaceae	ST	Construction, Firewood
12.	*Securinega virosa* (Roxb. ex Willd.) Baill.	Tokblu Khamchui	Euphorbiaceae	FR	Fruit eaten
13.	*Tamarindus indica*	Thentrwi	Fabaceae	FR	Fruit eaten
14.	*Tectona grandis*	Segun	Lamiaceae	S	Timber, Firewood
15.	*Sterculia villosa*	Phati bwphang	Malvaceae	BR, FR	Rope making, Fruit eaten
16.	*Albizia chinensis*	Bolphuk	Mimosaceae	S	Fire wood
17.	*Albizia procera*	Khuri	Mimosaceae	S	Timber, Fire wood
18.	*Artocarpus hirsutus*	Jram	Moraceae	FR	Ripe Fruit eaten
19.	*Artocarpus lacucha*	Duwa	Moraceae	FR	Ripe Fruit eaten
20.	*Ficus auriculata*	Drumpui	Moraceae	FR	Fruit eaten
21.	*Ficus semicordata*	Khuichang	Moraceae	FR	Ripe Fruit eaten
22.	*Syzygium cuminii*	Jam	Myrtaceae	FR, S	Ripe Fruit eaten, Timber, Fire wood
23.	*Caryota mitis* Lour.	Sumal	Palmae (Arecaceae)	S	Handicraft
24.	*Phoenix sylvestris*	Khajuri	Palmae (Arecaceae)	F, TW	Fruit eaten, Juice obtain from Trunk

25.	*Phyllanthus emblica* L.	Amlai	Phyllanthaceae	FR	Fruit eaten
26.	*Ziziphus jujuba*	Boroi	Rhamnaceae	FR	Fruit eaten
27.	*Ziziphus mauritiana* Lamk.	Boroi	Rhamnaceae	FR	Fruit eaten

Note:
B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber and WP = Whole Plant

ANNEXURE- 6

BIORESOURCES CULTIVATED BY VILLAGERS AT JHUM OR HOME GARDEN

Table 12: Herb Species reported as cultivated by locals in Jhum or Home garden

SN	Species Name	Common/ Local Name	Family	Parts used	Uses
1	*Andrographis paniculata*	Sirota	Acanthaceae	L, SH	Medicinal
2	*Amaranthus gracilis* Desf.	Maira	Amaranthaceae	S, L	Vegetables
3	*Coriandrum sativum* L.	Bakhor, Coriander	Apiaceae	S, L, SD	Flavour
4	*Eryngium foetidum* L.	Bilati bakhor,	Apiaceae (Umbelliferae)	SH, L	Flavour
5	*Alocasia cucullata*	Biskochu	Araceae	S, R	Vegetables
6	*Alocasia indica*	Muitu kotor	Araceae	S, R, ST, F	Vegetables
7	*Alocasia macrorrhiza*	Borkochu	Araceae	S, R	Vegetables
8	*Amorphophallus bulbifer*	Mui-morong, Batema	Araceae	S, B	Vegetables
9	*Colocasia esculenta*	Muitu, Dalkochu, Arvi	Araceae	S, R, F, ST	Vegetables
10	*Colocasia gigantea*	Manai	Araceae	S	Vegetables

11	*Homalomena aromatica*	Gandrwi, Kamaitru	Araceae	S, R	Vegetables, Medicinal
12	*Lasia spinosa*	Gantha	Araceae	S, R	Vegetables
13	*Blumea lanceolaria* (Roxb.) Druce	Barmajhal	Asteraceae (Compositae)	L, SH	Vegetables, Flavour
14	*Calendula officinalis*	Marigold,	Asteraceae	F, L	Ornamental, Medicinal
15	*Eupatorium triplinerve* Vahl.	Sogorem kwchak	Asteraceae (Compositae)	L, SH	Medicinal
16	*Spilanthes acmella* (L.) Murray.	Hukni Osundwi	Asteraceae (Compositae)	S, L, F	Vegetables, Flavour
17	*Basella alba*	Muiphrai, Malabar Spinach	Basellaceae	L, SH, F, FR	Vegetables
18	*Brassica nigra*	Hoiro, Black Mustard	Brassicaceae	SH, L	Vegetables
19	*Raphanus sativus* (L.) Domin	Mulai, Radish	Brassicaceae	WP	Vegetables
20	*Ananas comosus*	Omotwi	Bromeliaceae	F	Fruit eaten
21	*Spinacia oleracea* L.	Palak	Chenopodiaceae	L	Vegetables
22	*Ipomoea batatas*	Thaktwi, Sweet Potato	Convolvulaceae	T	Vegetables
23	*Kalanchoe pinnata* (Lam.) Pers.	Basanta Pata	Crassulaceae	L	Medicinal
24	*Benincasa hispida* (Thunb.) Cogn.	Khaklu	Cucurbitaceae	S, L, F, FR	Vegetables
25	*Coccinia grandis*	Potol, Ivy Gourd	Cucurbitaceae	F	Vegetables
26	*Gymnopetalum cochinchinensis* (Lour.) Kurz	Potol Kamranga	Cucurbitaceae	F	Vegetables
27	*Cucumis melo* L	Thai sumu	Cucurbitaceae	F	Fruit & Vegetables
28	*Cucumis sativus* L.	Sosa	Cucurbitaceae	F	
29	*Cucurbita maxima* Duch.	Ckakumura Kepher	Cucurbitaceae	S, L, SH, F, FR	Vegetables

30	*Cucurbita moschata* (Duch.) Poir.	Chakumura kolok	Cucurbitaceae	S, L, SH, F, FR	Vegetables
31	*Lagenaria siceraria* (Molina) Standley	Muilok, Tilok	Cucurbitaceae	S, L, SH, F, FR	Vegetables
32	*Luffa acutangula* (L.) Roxb.	Zinga	Cucurbitaceae	SH, FR	Vegetables
33	*Luffa cylindrica or Luffa aegyptiaca*	Phoro, Pholo	Cucurbitaceae	SH, FR	Vegetables
34	*Momordica charantia* L.	Gangla	Cucurbitaceae	SH, FR	Vegetables
35	*Momordica dioica* Roxb. ex Willd.	Bolongni Kangro	Cucurbitaceae	FR	Vegetables
36	*Trichosanthes anguina* L.	Puitha	Cucurbitaceae	FR	Vegetables
37	*Dioscorea alata*	Tha Kwchak, Purple Yam	Dioscoreaceae	T	Vegetables
38	*Dioscorea hamiltonii* Hook.f.	Tha-kun	Dioscoreaceae	T	Vegetables
39	*Dioscorea villosa*	Tha Bolong	Dioscoreaceae	T	Vegetables
40	*Bauccauria ramiflora* Lour	Kusumai	Euphorbiaceae	F	Fruit
41	*Canavalia gladiata*	Baikang	Fabaceae (Papilionaceae)	FR	Vegetables
42	*Dolichos lablab* L.	Masingni Kosoi, Winter beans	Fabaceae	L, FR	Vegetables
43	*Psophocarpus tetragonolobus* (L.) DC.	Kamranga kosoi	Fabaceae	FR	Vegetables
44	*Vigna unguiculata (L.)* Walp.	Subai	Fabaceae	FR, SD	Vegetables
45	*Elsholtzia griffithii*	Muilok banda	Lamiaceae	L, SH	Vegetables, Flavour
46	*Ocimum basilicum* L	Banda	Lamiaceae (Labiatae)	L, SH	Vegetables & Flavour

47	*Ocimum tenuiflorum* *Ocimum sanctum*	Tulsi	Lamiaceae (Labiatae)	L, SH	Medicinal
48	*Aloe barbadensis*	Aloe vera	Liliaceae	L	Medicinal
49	*Abelmoschus manihot* L.	Sikam Muirimi	Malvaceae	FR	Vegetables
50	*Corchorus capsularis*	Pat, Jute	Malvaceae	S	Fibre
51	*Hibiscus sabdariffa* L.	Khuni-mukhui, Anthur	Malvaceae	SH, FR	Vegetables
52	*Phrynium pubinerve*	Lairu	Marantaceae	L, SH	Vegetables
53	*Musa paradasiaca*	Thailik	Musaceae	S, F, FR	Fruit & Vegetables
54	*Sesamum indicum* L.	Siping	Pedaliaceae	SD	Vegetables & Spice
55	*Piper betel* L.	Phatwi	Piperaceae	L	Eaten
56	*Piper nigrum* L.	Gulmorich	Piperaceae	SD	Spice
57	*Cymbopogan citratus*	Soing mandar	Poaceae	L	Tea, Scent
58	*Saccharum officinarum*	Sugarcane, Kwruk	Poaceae	S	Eaten
59	*Zea mays*	Moka, Mokadam	Poaceae	FR	Vegetables, Popcorn
60	*Capsicum annuum* L.	Thamso, Moso, Chilli	Solanaceae	FR	Spice
61	*Solanum lycopersicum*	Tomato	Solanaceae	FR	Vegetables
62	*Solanum melongena* L.	Phantok, Brinjal	Solanaceae	FR	Vegetables
63	*Solanum tuberosum*	Aloo	Solanaceae	T	Vegetables
64	*Curcuma domestica/ Curcuma longa*	Sotwi, Kormo	Zingiberaceae	WP	Vegetables, Medicinal, Spice
65	*Zingiber officinale*	Haiching, Ginger	Zingiberaceae	WP	Vegetables, Medicinal, Spice
66	*Trachyspermum*	Khundrupui,	Apiaceae	L, SH	Flavour

	roxburghianum	Khunjuprwi			
73	*Musa spp.*	Anaji Thailik	Musaceae	S, F, FR	Vegetables
74	*Saccharum species*	Masinga	Poaceae	S	Juice
75	*Setaria italica*	Maisui	Poaceae	SD	Khir
76	*Oryza sativa*	Gelung Mai (variety)	Poaceae	SD	Main Food
77	*Oryza sativa*	Bedi Mai (variety)	Poaceae	SD	Main Food
79	*Oryza sativa*	Maimi watlok (variety)	Poaceae	SD	Main Food
80	*Oryza sativa*	Maimi mukhuk, (variety)	Poaceae	SD	Main Food
81	*Oryza sativa*	Suri Mai (variety)	Poaceae	SD	Main Food
82	*Oryza sativa*	Bungpui (Mai Sikam) (variety)	Poaceae	SD	Main Food
83	*Oryza sativa*	Badiya (variety)	Poaceae	SD	Main Food
84	*Oryza sativa*	Maimi (variety)	Poaceae	SD	Main Food
85	*Oryza sativa*	Mai Wanbang (variety)	Poaceae	SD	Main Food
86	*Oryza sativa*	Mai Songlwnpa (variety)	Poaceae	SD	Main Food
90	*Hibiscus sabdariffa*	Mukhui khu-kchak	Malvaceae	SH, L, F	Vegetables

Note:
B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber and WP = Whole Plant

Table 13: Shrub Species reported as cultivated by locals in Jhum or Home garden

SN	Name of species	Common/ Local Name	Family	Part used	Uses
1	*Cordiaeum variegatum* (L.)	Patabahar	Euphorbiaceae	F	Ornamental
2	*Manihot esculenta*	Thaborchuk	Euphorbiaceae	R	Vegetables, Eaten boiled
4	*Acacia pennata*	Muikambuk	Fabaceae	SH	Vegetables

			(Mimosaceae)		
5	*Caesalpinia pulcherrima* L.	Krishna Chora	Fabaceae (Mimosaceae)	F	Ornamental
6	*Cajanus cajan*	Khokleng	Fabaceae (Papilionaceae)	FR, SD	Vegetables
	Cassia occidentalis	Muitati	Fabaceae	L, SH	Vegetables
7	*Gossypium arboreum* L.	Khul	Malvaceae	FR	Cotton
8	*Gossypium hirsutum* L.	Khul	Malvaceae	FR	Cotton
9	*Hibiscus rosa-sinensis* L.	Jaba	Malvaceae	F	Ornamental
10	*Bougainvillea glabra* Choicy.	Khum kagoch	Nyctaginaceae	F	Ornamental
11	*Calamus leptospadix*	Rai	Palmae (Arecaceae)	S	Fibre, Handicraft
12	*Calamus heteracanthus*	Rai	Palmae (Arecaceae)	S	Fibre, Handicraft
13	*Bambusa balcooa*	Washur, Barak	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
14	*Bambusa bambos*	Washur busu, Kanta barak	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
15	*Bambusa polymorpha*	Parwa	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
16	*Bambusa tulda*	Wandal	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
17	*Bambusa spp.*	Wamlang	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
18	*Dendrocalamus longispathus*	Wamilik	Poaceae	SH, S,	Vegetables, Construction,

				RZ	Handicraft
19	*Melocanna bacifera*	Wathwi, Muli	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
20	*Rosa indica*	Gulab	Rosaceae	F	Ornamental
21	*Ixora coccinea* L.	Dhalia	Rubiaceae	F	Ornamental
22	*Citrus limon*	Lemon	Rutaceae	FR, L	Juice, Flavour
23	*Citrus macroptera*	Satokra	Rutaceae	FR, L	Juice, Flavour
24	*Solanum aethiopicum*	Sikam Khamkha	Solanaceae	FR	Vegetables
25	*Solanum indicum*	Khamkha	Solanaceae	FR	Vegetables

Note:
B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber and WP = Whole Plant

Table 14: Tree Species reported as cultivated by locals in Jhum or Home garden

SN	Name of the species	Common/ Local Name	Family	Part used	Uses
1	*Mangifera indica*	Thaichuk	Anacardiaceae	FR	Fruit eaten, Pickle
2	*Spondias pinnata*	Thaistwi	Anacardiaceae	FR	Fruit eaten, Pickle
3	*Spondius dulcis*	Aamra	Anacardiaceae	FR	Fruit eaten, Pickle
4	*Annona reticulata* L.	Atafol	Annonaceae	FR	Fruit eaten
5	*Annona squamosa* L	Sirphal	Annonaceae	FR	Fruit eaten
6	*Trevesia palmata* Roxb.	Chapok	Araliaceae	F, FR	Vegetables
7	*Carica papaya* L.	Kokiya, Kengkiya	Caricaceae	FR	Fruit eaten
8	*Garcinia cowa* Roxb.	Kok, Akau	Clusiaceae	FR	Fruit eaten
9	*Garcinia*	Yellow	Clusiaceae	FR	Fruit eaten,

	xanthochymus	Mangosteen			Pickle
10	*Terminalia bellirica*	Dedaluk, Dedagui	Combretaceae	FR	Fruit eaten, Medicinal
11	*Terminalia chebula* Retz.	Bakhla	Combretaceae	FR	Fruit eaten, Medicinal
12	*Dillenia indica*	Thaiplo	Dilleniaceae	FR	Fruit eaten, Pickle
13	*Diospyros malabarica* (Desr.) kostel	Gab	Ebenaceae	FR	Fruit eaten
14	*Elaeocarpus serratus*	Jolpui	Elaeocarpaceae	FR	Fruit eaten, Pickle
15	*Parkia speciosa*	Waikre	Fabaceae	FR	Vegetables
16	*Sesbania grandiflora* (L.) Poiret	Bokul	Fabaceae	F	Vegetables
17	*Tamarindus indica*	Thentrwi	Fabaceae	FR	Fruit eaten
18	*Tectona grandis*	Segun	Lamiaceae	S	Timber, Firewood
19	*Sterculia villosa*	Phati bwphang	Malvaceae	BR, FR	Rope making, Fruit eaten
20	*Albizia chinensis*	Bolphuk	Mimosaceae	S	Fire wood
21	*Albizia procera*	Khuri	Mimosaceae	S	Timber, Fire wood
22	*Artocarpus heterophyllus*	Thaipong	Moraceae	FR	Vegetables, Ripe Fruit eaten
23	*Hevea brasiliensis*	Rubber	Moraceae	LX, S	Rubber, Fire wood
24	*Moringa oleifera*	Sejna	*Moringaceae*	FR, F, L	*Vegetables*
25	*Psidium guajava*	Goyam	Myrtaceae	FR	Fruit eaten
26	*Syzygium cuminii*	*Jam*	Myrtaceae	FR, S	Ripe Fruit eaten, Timber, Fire wood
27	*Nyctanthes arbortristis* L	*Sitoli*	Oleaceae	F	Ornamental
28	*Averrhoa carambola*	Kamranga	Oxalidaceae	FR	Fruit eaten

	L.				
29	*Areca catechu*	Kowai	Palmae (Arecaceae)	FR	Fruit eaten
30	*Caryota mitis* Lour.	Sumal,	Palmae (Arecaceae)	S	Handicraft
31	*Cocos nucifera*	Narikra	Palmae (Arecaceae)	FR	Fruit eaten
32	*Phoenix sylvestris*	Khajuri	Palmae (Arecaceae)	F, TW	Fruit eaten, Juice obtain from Trunk
33	*Phyllanthus acidus* L	Al Boroi, Leheri,	Phyllanthaceae	FR	Fruit eaten
34	*Phyllanthus emblica* L.	Amlai	Phyllanthaceae	FR	Fruit eaten
35	*Ziziphus jujuba*	Boroi	Rhamnaceae	FR	Fruit eaten
36	*Ziziphus mauritiana* Lamk.	Boroi	Rhamnaceae	FR	Fruit eaten
37	*Aegle marmelos*	Bel	Rutaceae	FR	Fruit eaten
38	*Citrus maxima*	Jambora	Rutaceae	FR	Fruit eaten
39	*Citrus x sinensis*	Komla	Rutaceae	FR	Fruit eaten
40	*Zanthoxylum panamense*	Muicheng	Rutaceae	L	Vegetables, Flavour

Note:
B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber and WP = Whole Plant

ANNEXURE- 7

BIORESOURCES WHICH THE VILLAGERS USED TO BUY FROM MARKET

Table 15: Herb Species reported which the villagers used to buy from market

SN	*Species Name*	Common/ Local Name	Family	Parts used	Uses
1	*Amaranthus gracilis* Desf.	Maira	Amaranthaceae	S, L	Vegetables
2	*Allium cepa*	Piyas	Amaryllidaceae	B	Spice

3	*Allium sativum*	Risum	Amaryllidaceae	CL	Spice, Flavour
4	*Centilla asiatica*	Samsota	Apiaceae	S, L	Vegetables
5	*Eryngium foetidum* L.	Bilati bakhor,	Apiaceae (Umbelliferae)	SH, L	Flavour
	Trachyspermum roxburghianum	Khundrupui, Khunjuprwi	Apiaceae	L, SH	Flavour
6	*Alocasia indica*	Muitu kotor	Araceae	S, R, ST, F	Vegetables
7	*Alocasia macrorrhiza*	Borkochu	Araceae	S, R	Vegetables
8	*Amorphophallus bulbifer*	Mui-morong, Batema	Araceae	S, B	Vegetables
9	*Colacasia esculenta*	Muitu, Dalkochu, Arvi	Araceae	S, R, F, ST	Vegetables
10	*Colocasia gigantea*	Manai	Araceae	S	Vegetables
11	*Homalomena aromatica*	Gandrwi, Kamaitru	Araceae	S, R	Vegetables, Medicinal
12	*Lasia spinosa*	Gantha	Araceae	S, R	Vegetables
13	*Acmella oleracea* L	Osundui	Asteraceae	S, L, F	Vegetables, Flavour
14	*Blumea lanceolaria* (Roxb.) Druce	Barmajhal	Asteraceae (Compositae)	L, SH	Vegetables, Flavour
15	*Spilanthes acmella* (L.) Murray.	Hukni Osundwi	Asteraceae (Compositae)	S, L, F	Vegetables, Flavour
16	*Diplazium esculentum* (Retz.) Sw.	Muikoitroi, Muikhunchok, Mui khonte	Athyriaceae	SH	Vegetables
17	*Basella alba*	Muiphrai, Malabar Spinach	Basellaceae	L, SH, F, FR	Vegetables
18	*Brassica nigra*	Hoiro, Black Mustard	Brassicaceae	SH, L	Vegetables
19	*Brassica oleracea* var. capitata	Banda Kopi	Brassicaceae	F	Vegetables
20	*Brassica oleracea* var. botrytis	Phul kopi	Brassicaceae	F	Vegetables

21	*Raphanus sativus* (L.) Domin	Mulai, Radish	Brassicaceae	WP	Vegetables
22	*Ananas comosus*	Omotwi	Bromeliaceae	F	Fruit Eaten
23	*Polycarpon prostratum* (Forssk.) Aschers & Schweinf.	Bukhate, Jhima	Caryophyllaceae	S, SH, L	Vegetables
24	*Spinacia oleracea* L.	Palak	Chenopodiaceae	L	Vegetables
25	*Benincasa hispida* (Thunb.) Cogn.	Khaklu	Cucurbitaceae	S, L, F, FR	Vegetables
26	*Citrullus lanatus* (Thunb.) Mansf.	Mukfal	Cucurbitaceae	FR	Fruit Eaten
27	*Coccinia grandis*	Potol, Ivy Gourd	Cucurbitaceae	F	Vegetables
28	*Cucumis melo* L	Thaisumu	Cucurbitaceae	F	Fruit & Vegetables
29	*Cucumis sativus* L.	Sosa	Cucurbitaceae	F	
30	*Cucurbita maxima* Duch.	Chakumura Kepher	Cucurbitaceae	S, L, SH, F, FR	Vegetables
31	*Cucurbita moschata* (Duch.) Poir.	Chakumura kolok	Cucurbitaceae	S, L, SH, F, FR	Vegetables
32	*Lagenaria siceraria* (Molina) Standley	Muilok, Tilok	Cucurbitaceae	S, L, SH, F, FR	Vegetables
33	*Luffa acutangula* (L.) Roxb.	Zinga	Cucurbitaceae	SH, FR	Vegetables
34	*Momordica charantia* L.	Gangla	Cucurbitaceae	SH, FR	Vegetables
35	*Momordica cochinchinensis* (Lour.) Spreng.	Khetoni kangro	Cucurbitaceae	FR	Vegetables
36	*Momordica dioica* Roxb. ex Willd.	Bolongni Kangro	Cucurbitaceae	FR	Vegetables
37	*Trichosanthes anguina* L.	Puitha	Cucurbitaceae	FR	Vegetables
38	*Dioscorea alata*	Tha Kwchak, Purple Yam	Dioscoreaceae	T	Vegetables

39	*Dioscorea hamiltonii* Hook.f.	Tha-kun	Dioscoreaceae	T	Vegetables
40	*Dioscorea villosa*	Tha Bolong	Dioscoreaceae	T	Vegetables
41	*Arachis hypogaea* L.	Badam,	Fabaceae (Papilionaceae)	SD	Eaten
42	*Canavalia gladiata*	Baikang	Fabaceae (Papilionaceae)	FR	Vegetables
43	*Dolichos lablab* L.	Masingni Kosoi, Winter beans	Fabaceae	L, FR	Vegetables
44	*Psophocarpus tetragonolobus* (L.) DC.	Kamranga kosoi	Fabaceae	FR	Vegetables
45	*Vigna unguiculata (L.)* Walp.	Subai	Fabaceae	FR, SD	Vegetables
46	*Elsholtzia blanda Benth. / Elsholtzia griffithii*	Muilok banda	Lamiaceae	L, SH	Vegetables, Flavour
47	*Hibiscus sabdariffa* L.	Khuni-mukhui, Anthur	Malvaceae	SH, FR	Vegetables
48	*Musa paradasiaca*	Thailik	Musaceae	S, F, FR	Fruit & Vegetables
49	*Musa balbisiana*	Bolong thailik (Tangpui)	Musaceae	S, F, FR	Fruit & Vegetables
	Musa spp.	Anaji Thailik	Musaceae	S, F, FR	Vegetables
50	*Piper betel* L.	Phatwi	Piperaceae	L	Eaten
51	*Piper nigrum* L.	Gulmorich	Piperaceae	SD	Spice
52	*Imperata cylindrica* (L.) Raeusch.	Soin	Poaceae	L	Roof making
53	*Oryza sativa*	Maimi, Sticky rice	Poaceae	SD	Main Food
54	*Saccharum officinarum*	Kwruk, Sugarcane	Poaceae	S	Eaten
55	*Thysanolaena latifolia*	Noksi	Poaceae	SH	Broom
56	*Zea mays*	Moka, Mokadam	Poaceae	FR	Vegetables, Popcorn

57	*Monochoria vaginalis* (Burm. F.)	Chichiri, Kechurwi	Pontederiaceae	SH	Vegetables
58	*Monochoria hastate*	Chichiri, Kechurwi	Pontederiaceae	SH	Vegetables
59	*Capsicum annuum* L.	Thamso	Solanaceae	FR	Spice
60	*Solanum lycopersicum*	Tomato	Solanaceae	FR	Vegetables
61	*Solanum melongena* L.	Phantok, Brinjal	Solanaceae	FR	Vegetables
62	*Solanum tuberosum*	Aloo	Solanaceae	T	Vegetables
63	*Alpinia allughas (nigra)*	Therai	Zingiberaceae	S	Vegetables
64	*Alpinia malaccensis* (Burm.f.) Rosc.	Biring	Zingiberaceae	S	Vegetables
65	*Curcuma longa*	Sotwi, Kormo	Zingiberaceae	WP	Vegetables, Medicinal, Spice
66	*Zingiber officinale*	Haiching, Ginger	Zingiberaceae	WP	Vegetables, Medicinal, Spice

Note:
B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber and WP = Whole Plant

Table 16 Shrub Species reported which the villagers used to buy from market

SN	Name of species	Common/ Local Name	Family	Part used	Uses
1	*Ananas comosus*	Omotwi	Bromeliaceae	FR	Fruit edible
2	*Manihot esculenta*	Thaborchuk	Euphorbiaceae	R	Vegetables, Eaten boiled
3	*Cajanus cajan*	Khokleng	Fabaceae (Papilionaceae)	FR, SD	Vegetables
4	*Bambusa tulda*	Wandal	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
5	*Dendrocalamus longispathus*	Wamilik	Poaceae	SH, S,	Vegetables, Construction,

				RZ	Handicraft
6	*Melocanna bacifera*	Wathwi, Muli	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
7	*Schizostachyum dullooa*	Watlok Dulu	Poaceae	SH, S, RZ	Vegetables, Construction, Weaving, Handicraft
8	*Ziziphus oenoplia* (L.) Miller.	Boroi	Rhamnaceae	FR	Eaten
9	*Citrus limon*	Lemon	Rutaceae	FR, L	Juice, Flavour
10	*Citrus macroptera*	Satokra	Rutaceae	FR, L	Juice, Flavour
11	*Solanum aethiopicum*	Sikam Khamkha	Solanaceae	FR	Vegetables
12	*Solanum torvum*	Khamkha	Solanaceae	FR	Vegetables
13	*Solanum indicum*	Khamkha	Solanaceae	FR	Vegetables

Note:
B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber and WP = Whole Plant

Table 17 Tree species reported which the villagers used to buy from market

SN	Name of the species	Common/ Local Name	Family	Part used	Uses
1	*Mangifera indica*	Thaichuk	Anacardiaceae	FR	Fruit eaten, Pickle
2	*Spondius dulcis*	Aamra	Anacardiaceae	FR	Fruit eaten, Pickle
3	*Trevesia palmata* Roxb.	Chapok	Araliaceae	F, FR	Vegetables
4	*Garcinia cowa* Roxb.	Kok, Akau	Clusiaceae	FR	Fruit eaten
5	*Dillenia pentagyna*	Mandul buthai	Dilleniaceae	FR	Fruit eaten
6	*Elaeocarpus serratus*	Jolpui	Elaeocarpaceae	FR	Fruit eaten, Pickle

7	*Parkia speciosa*	Waikre	Fabaceae	FR	Vegetables
8	*Tamarindus indica*	Thentrwi, Tamarind	Fabaceae	FR	Fruit eaten
9	*Artocarpus heterophyllus*	Thaipong	Moraceae	FR	Vegetables, Ripe Fruit eaten
10	*Moringa oleifera*	Sejna	*Moringaceae*	FR, F, L	*Vegetables*
11	*Psidium guajava*	Goyam	Myrtaceae	FR	Fruit eaten
12	*Syzygium cuminii*	*Jam*	Myrtaceae	FR, S	Ripe Fruit eaten, Timber, Fire wood
13	*Averrhoa carambola* L.	Kamranga	Oxalidaceae	FR	Fruit eaten
14	*Areca catechu*	Kowai	Palmae (Arecaceae)	FR	Fruit eaten
15	*Cocos nucifera*	Narikra	Palmae (Arecaceae)	FR	Fruit eaten
16	*Phyllanthus acidus* L.	Al Boroi, Leheri,	Phyllanthaceae	FR	Fruit eaten
17	*Ziziphus jujuba*	Boroi	Rhamnaceae	FR	Fruit eaten
18	*Ziziphus mauritiana* Lamk.	Boroi	Rhamnaceae	FR	Fruit eaten
19	*Citrus x sinensis*	Komla	Rutaceae	FR	Fruit eaten
20	*Citrus maxima*	Jambora	Rutaceae	FR	Fruit eaten
21	*Zanthoxylum panamense*	Muicheng	Rutaceae	L	Vegetables, Flavour

Note:
B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber and WP = Whole Plant

Table 18 Other bioresource which the villagers used to buy from market

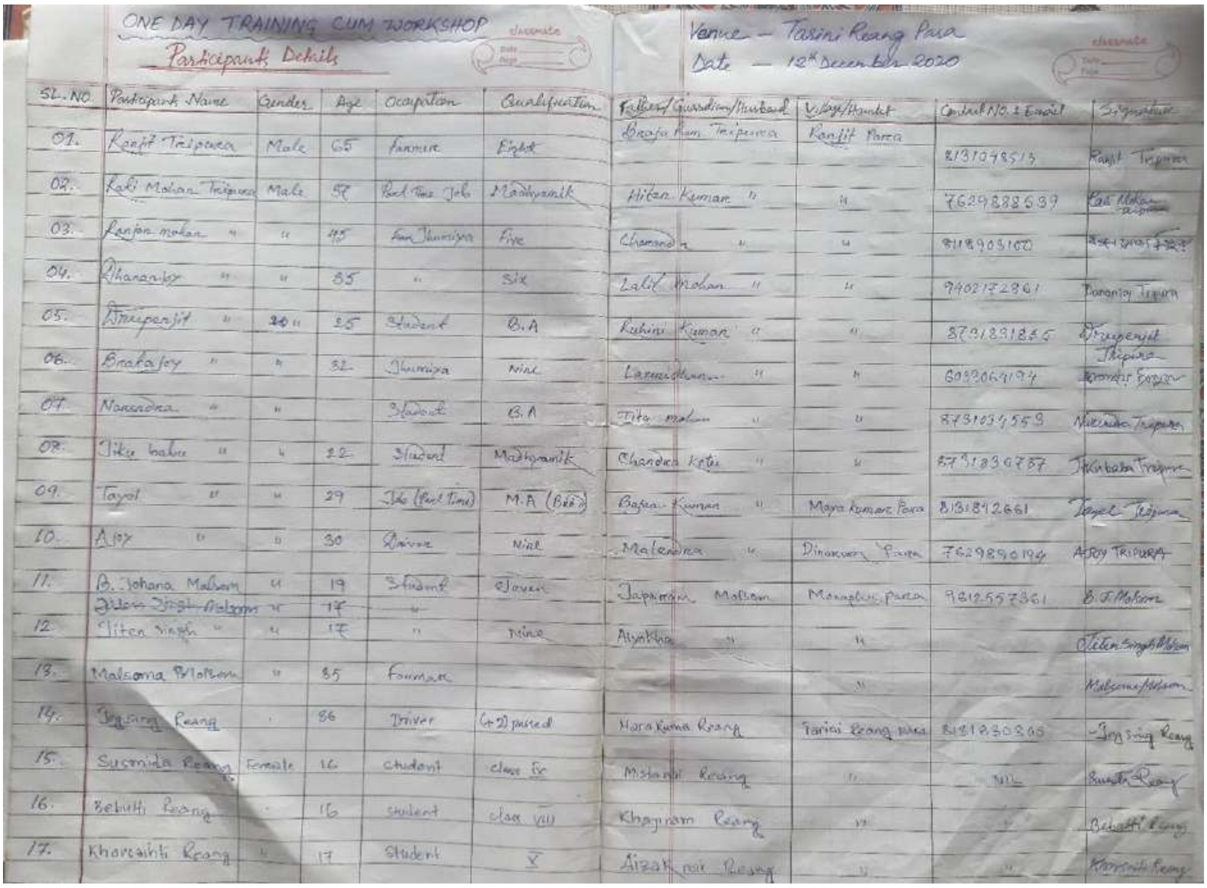
SN	Raw material	Product/ Common Name	Parts Use	Uses
1.	*Brotia costula*	Sikambuk, Edible	Everything except the	Cooked and eaten

		snails	hard coat	as curry
2.	*Bulinus truncatus*	Kakambuk, Edible snails	Everything except the hard coat	Cooked and eaten as curry
3.	*Pila speciosa*	Totobak, Pila	Everything except the hard coat	Cooked and eaten as curry
4.	*Fenneropenaeus indicus*	Athuk, Prawn	All	Cooked and eaten as curry
5.	Different Fishes	Aakran, Dry fish	All	Added to curry for flavour
6.	*Ticto barb*	Berman, Fermented fish	All	Added to curry for flavour
7.	*Lamellidens marginalis*	Sindai, Mussels	Everything except the hard coat	Cooked and eaten as curry
8.	*Sartoriana spinigera*	Khangrai, Crabs	All	Cooked and eaten as curry
9.	Various wild edible fungus and mushrooms	Muikhumu	All	Cooked and eaten as curry
10.	*Gallus gallus* domesticus	Toktwi	Everything except the hard coat	Cooked and eaten as curry
11.	*Shorea robusta*	Satrai	Resin	Burned as incense

Note:
B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber and WP = Whole Plant

ANNEXURE- 8

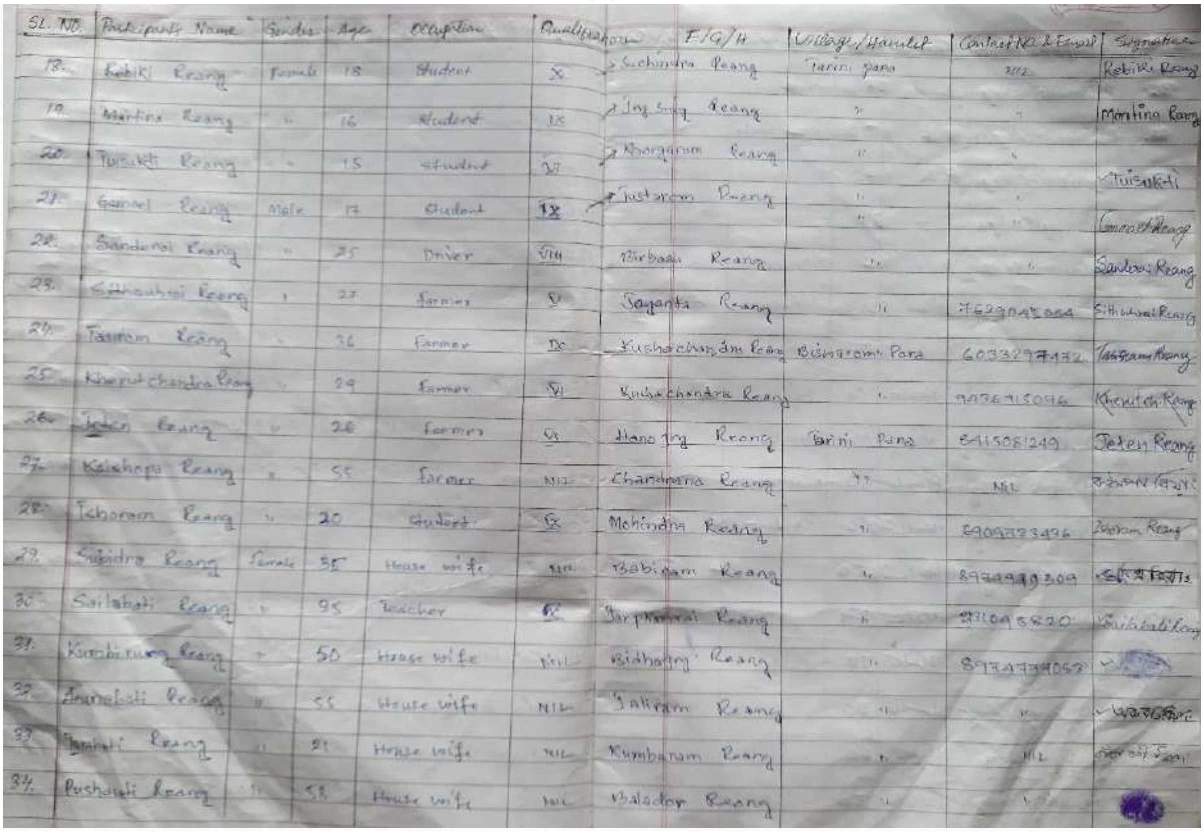
1. List of participants who attended one day Training Cum Workshop



ONE DAY TRAINING CUM WORKSHOP
Participants Details
Venue – Tarini Reang Para
Date – 12th December 2020

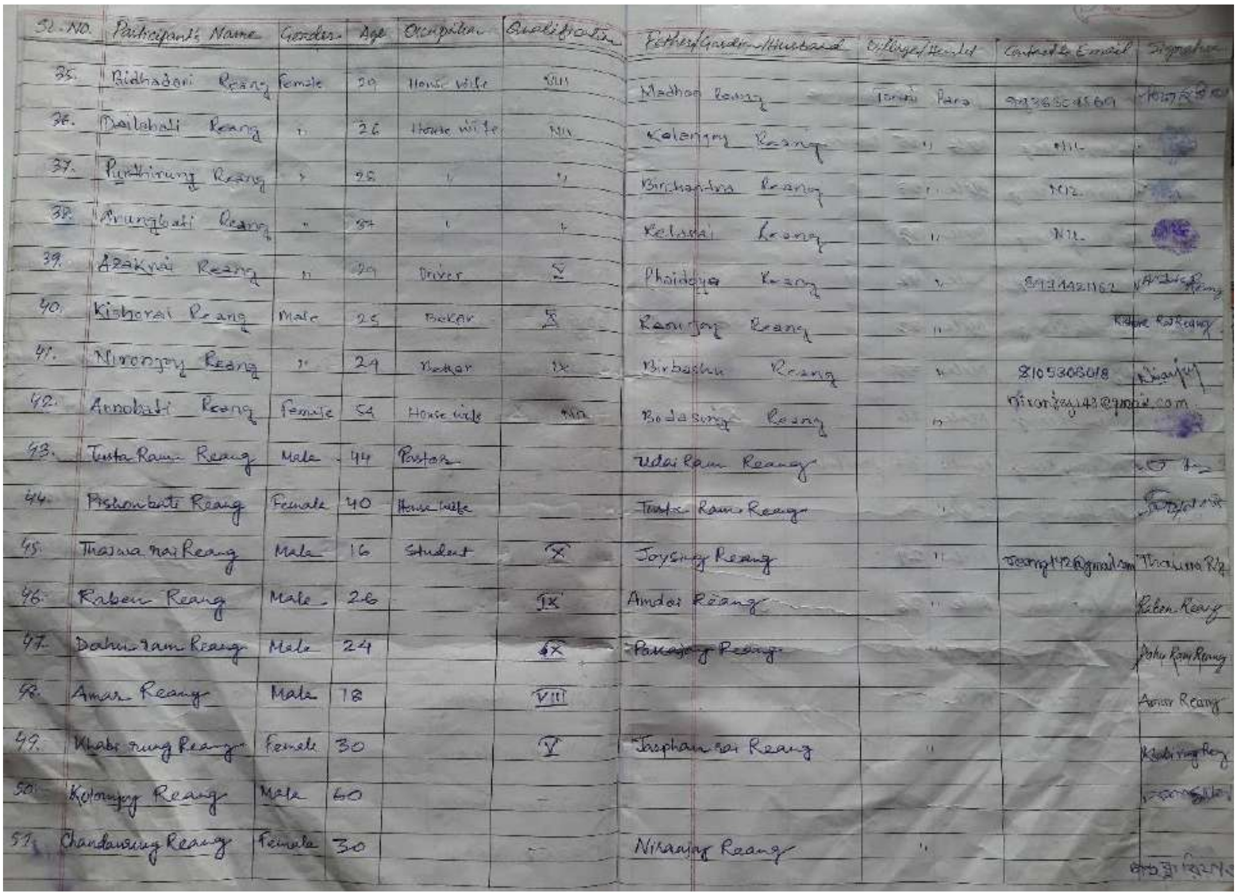
SL. NO.	Participant Name	Gender	Age	Occupation	Qualification	Father/Guardian/Husband	Village/Hamlet	Contact No. & Email	Signature
01.	Ranjit Tripura	Male	65	Farmer	Eight	Braja Ram Tripura	Ranjit Para	8131098513	Ranjit Tripura
02.	Kali Mohan Tripura	Male	57	Part Time Job	Madhyamik	Hiten Kumar "	"	7629888639	Kali Mohan Tripura
03.	Ranjan mohan "	"	45	Jhumiya	Five	Chanand "	"	8118903100	[illegible]
04.	Dhananjoy "	"	35	"	Six	Lalit Mohan "	"	9402172861	Dhananjoy Tripura
05.	Drupanjit "	"	25	Student	B.A	Rohini Kumar "	"	8731891865	Drupenjit Tripura
06.	Brakajoy "	"	32	Jhumiya	Nine	Laxmidhan "	"	6033064194	[illegible]
07.	Narendra "	"		Student	B.A	Jita mohan "	"	8731034559	Narendra Tripura
08.	Jiku babu "	"	22	Student	Madhyamik	Chandra Keti "	"	8731830787	Jikubabu Tripura
09.	Tayal "	"	29	Job (Part Time)	M.A (B.Ed)	Bajan Kumar "	Maya kumar Para	8131842661	Tayal Tripura
10.	Ajoy "	"	30	Driver	Nine	Malendra "	Dinamani Para	7629890194	AJOY TRIPURA
11.	B. Johana Malsom	"	19	Student	Eleven	Japaram Malsom	Monglu para	9612557361	B.J.Malsom
	~~Jiten Singh Malsom~~ "		~~17~~	"					
12.	Jiten Singh "	"	17	"	Nine	Aiyakha "	"		Jiten Singh Malsom
13.	Malsoma Malsom	"	35	Farmer			"		Malsoma Malsom
14.	Jngsing Reang		36	Driver	(+2) passed	Hara Kuma Reang	Tarini Reang para	8131830805	Jngsing Reang
15.	Susmita Reang	Female	16	Student	class IX	Mistanti Reang	"	NIL	Susmita Reang
16.	Bebiti Reang		16	Student	class VIII	Khajiram Reang	"	"	Bebiti Reang
17.	Khorcaihti Reang	"	17	Student	X	Aizak rai Reang	"	"	Khorcaihti Reang

(A)



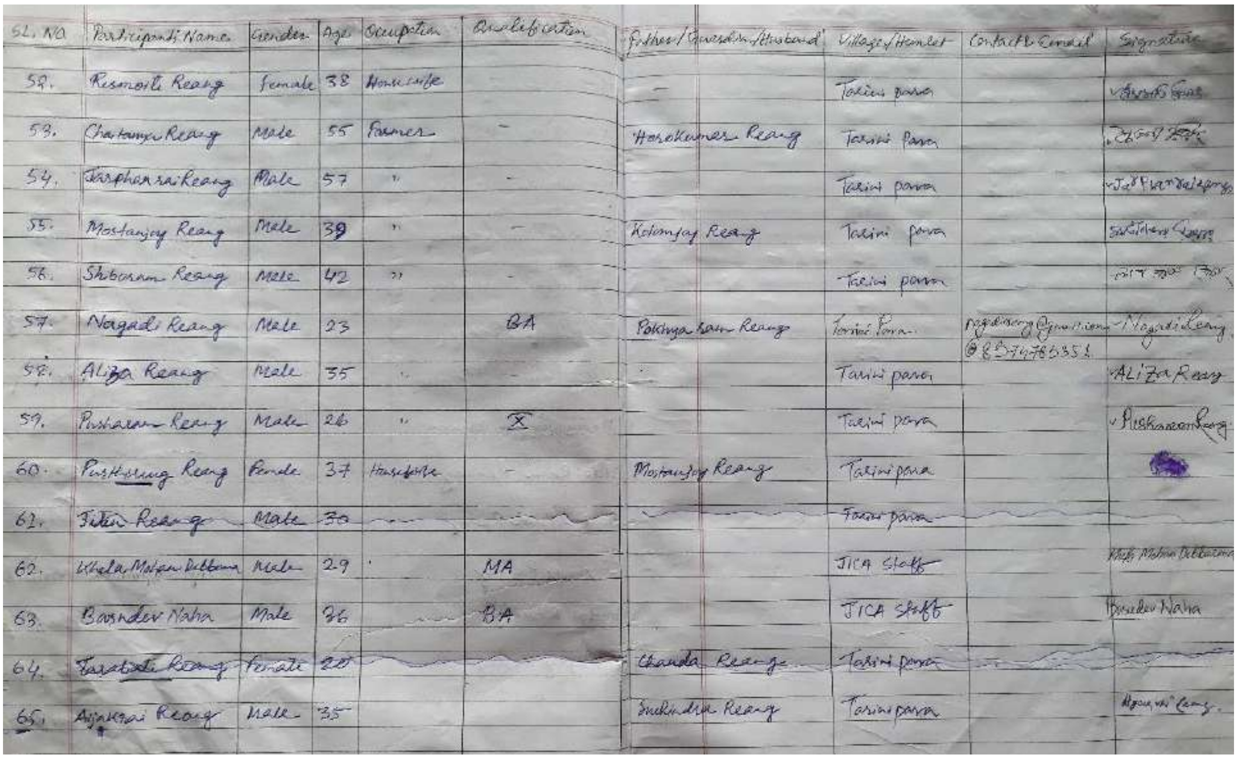
SL. NO.	Participants Name	Gender	Age	Occupation	Qualification	F/G/H	Village/Hamlet	Contact No & Email	Signature
18.	Kebiki Reang	Female	18	Student	X	Suchindra Reang	Tarini para	NIL	Kebiki Reang
19.	Martina Reang	"	16	Student	IX	Jng Sing Reang	"	"	Martina Reang
20.	Tuisukti Reang	"	15	Student	VI	Bongaram Reang	"	"	Tuisukti
21.	Gannel Reang	Male	17	Student	IX	Justaram Reang	"	"	Gannel Reang
22.	Sandenai Reang	"	25	Driver	VIII	Birbasi Reang	"	"	Sandenai Reang
23.	Sithouhai Reang	"	27	farmer	V	Jayanta Reang	"	7629945064	Sithouhai Reang
24.	Tasram Reang	"	36	Farmer	Do	Kushachandra Reang	Bishnoram Para	6033297472	Tasram Reang
25.	Khenut chandra Reang	"	29	farmer	VI	Kushachandra Reang	"	9436915096	Khenut ch Reang
26.	Jeken Reang	"	26	farmer	IX	Hano Jng Reang	Tarini Para	8415081249	Jeken Reang
27.	Kaishopi Reang	"	55	farmer	NIL	Chandmena Reang	"	NIL	[illegible]
28.	Ichoram Reang	"	20	Student	IX	Mohindra Reang	"	8909723496	Ichoram Reang
29.	Subidra Reang	Female	35	House wife	NIL	Babiram Reang	"	8974949309	[illegible]
30.	Sailabati Reang	"	95	Teacher	IX	Jarphinrai Reang	"	9310965820	Sailabati Reang
31.	Kumbirung Reang	"	50	House wife	NIL	Bidhajoy Reang	"	8974794053	[illegible]
32.	Anabati Reang	"	55	House wife	NIL	Jaliram Reang	"	"	[illegible]
33.	[illegible] Reang	"	21	House wife	NIL	Kumbaram Reang	"	NIL	[illegible]
34.	Pushpati Reang	"	58	House wife	NIL	Baladar Reang	"	"	[illegible]

(B)



Sl. No.	Participant's Name	Gender	Age	Occupation	Qualification	Father/Guardian/Husband	Village/Hamlet	Contact & Email	Signature
35.	Bidhadori Reang	Female	29	House wife	VIII	Madhab Reang	Torini Para	9436504569	[illegible]
36.	Dailabati Reang	"	26	House wife	Nil	Kolenjoy Reang	"	Nil	
37.	Purthirung Reang	"	28	"	"	Birchandra Reang	"	Nil	
38.	Arungbati Reang	"	37	"	"	Kelsurai Reang	"	Nil	
39.	Azakrai Reang	"	29	Driver	V	Phaidoya Reang	"	8131442162	[illegible]
40.	Kishorai Reang	Male	25	Baker	X	Ramjoy Reang	"		Kishore Rai Reang
41.	Niranjoy Reang	"	24	Nather	IX	Birbashu Reang	"	8105306018 niranjoy143@gmail.com	[illegible]
42.	Annobati Reang	Female	54	House wife	Nil	Bodasing Reang	"		
43.	Tusta Ram Reang	Male	44	Pastor		Udai Ram Reang			[illegible]
44.	Pishonbati Reang	Female	40	House wife		Tusta Ram Reang	"		[illegible]
45.	Thasua nai Reang	Male	16	Student	X	Joysing Reang	"	[illegible]@gmail.com	Thasua Rg
46.	Raben Reang	Male	26		IX	Amdai Reang	"		Raben Reang
47.	Dahu Ram Reang	Male	24		IX	Pancajoy Reang			Dohu Ram Reang
48.	Amar Reang	Male	18		VIII				Amar Reang
49.	Khabirung Reang	Female	30		V	Jasphan Rai Reang	"		Khabirung Reang
50.	Kolonjoy Reang	Male	60		-				[illegible]
51.	Chandausing Reang	Female	30		-	Niranjoy Reang	"		[illegible]

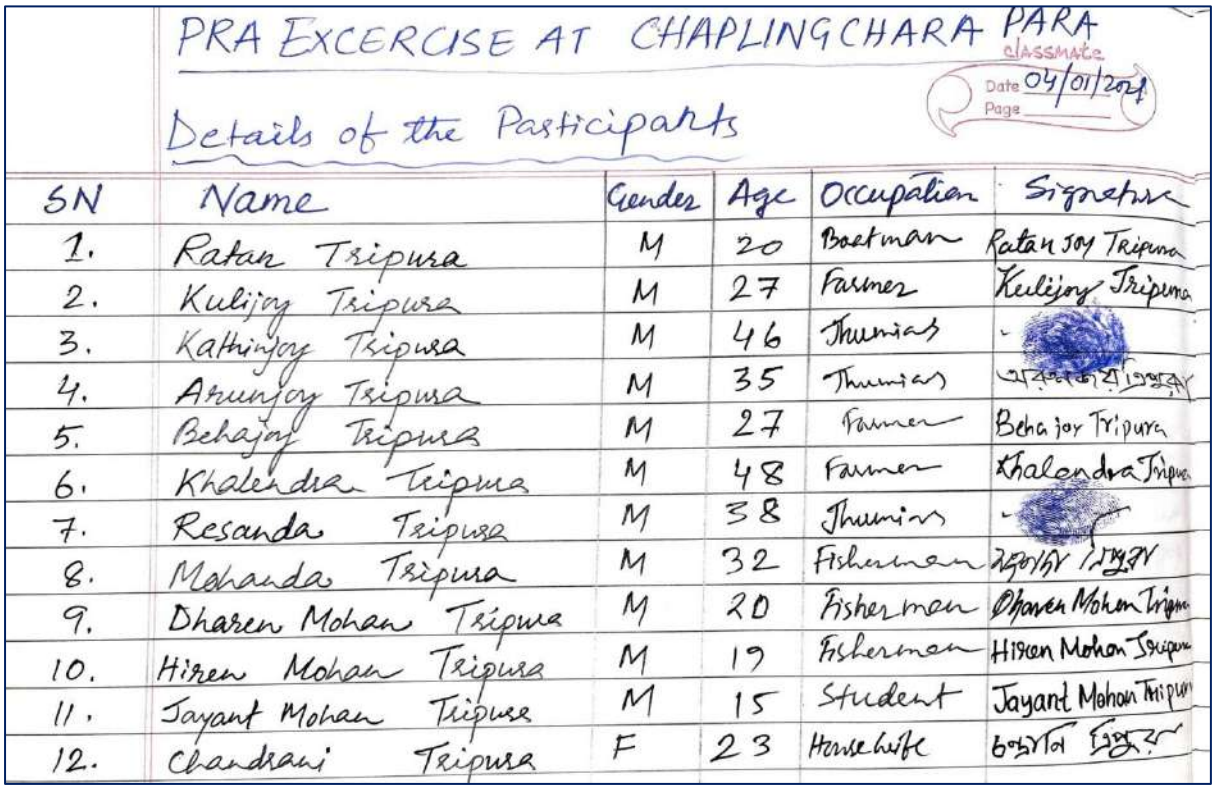
(C)



Sl. No.	Participant's Name	Gender	Age	Occupation	Qualification	Father/Guardian/Husband	Village/Hamlet	Contact & Email	Signature
52.	Rismoiti Reang	Female	38	House wife		-	Tarini para		[illegible]
53.	Chatamjoy Reang	Male	55	Farmer	-	Harakumar Reang	Tarini Para		[illegible]
54.	Jasphanrai Reang	Male	57	"	-		Tarini para		Jasphanrai Reang
55.	Mostanjoy Reang	Male	39	"	-	Kolonjoy Reang	Tarini para		[illegible]
56.	Shiboram Reang	Male	42	"	-		Tarini para		[illegible]
57.	Nagadi Reang	Male	23		BA	Pokhya Ram Reang	Tarini Para	nagadireang@gmail.com 8574765351	Nagadi Reang
58.	Aliza Reang	Male	35	"	-		Tarini para		ALiZa Reang
59.	Pusharam Reang	Male	26	"	X		Tarini para		Pusharam Reang
60.	Pusthoirung Reang	Female	37	House wife	-	Mostanjoy Reang	Tarini para		
61.	Jiten Reang	Male	30				Tarini para		
62.	Khela Mohan Debbarma	Male	29		MA		JICA Staff		Khela Mohan Debbarma
63.	Basudev Naha	Male	36		BA		JICA Staff		Basudev Naha
64.	Tarabati Reang	Female	20			Chanda Reang	Tarini para		
65.	Ajakrai Reang	Male	35			Sukhendra Reang	Tarini para		Ajakrai Reang

(D)

2. List of participants who attended PRA Exercise at different beneficiary villages (A-I)

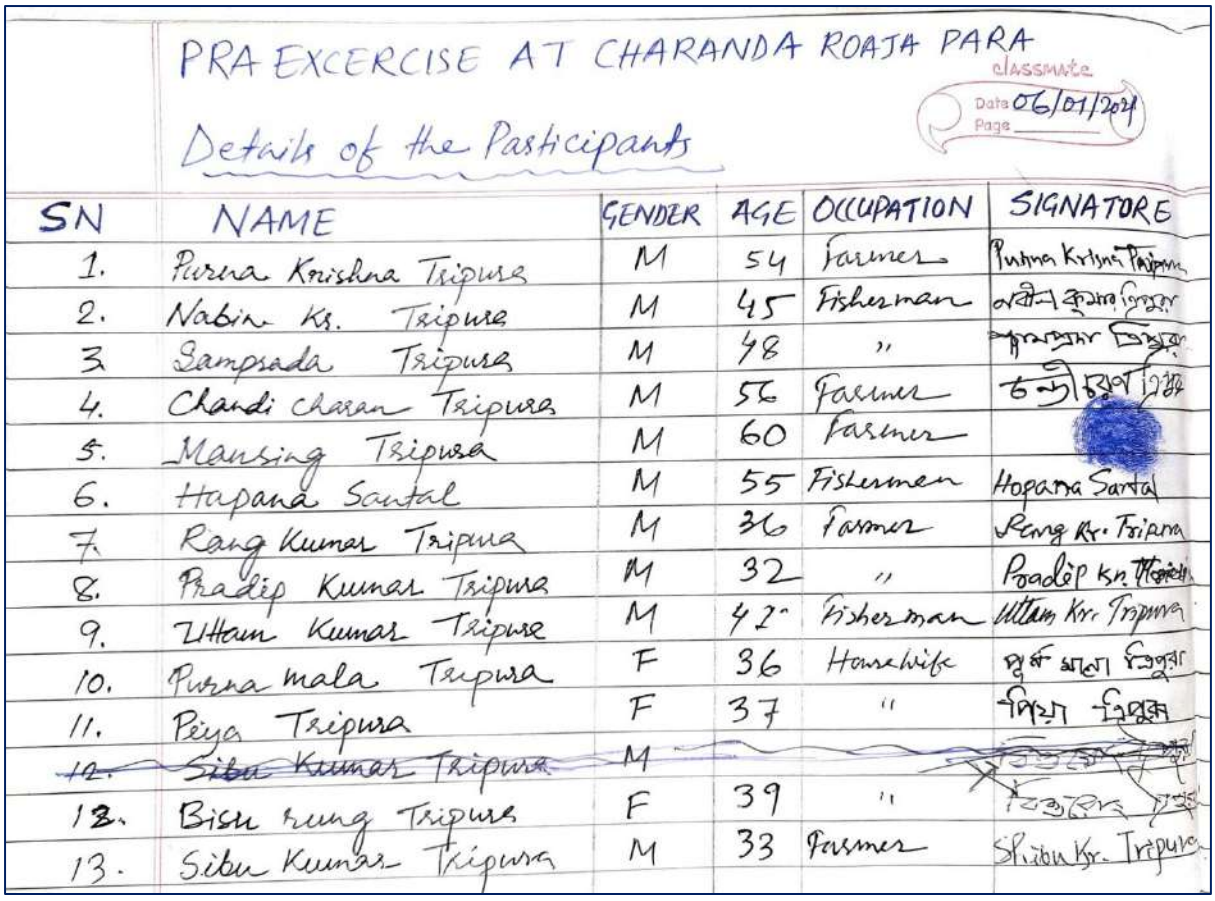


PRA EXCERCISE AT CHAPLINGCHARA PARA

Details of the Pasticiparts

SN	Name	Gender	Age	Occupation	Signature
1.	Ratan Tripura	M	20	Boatman	Ratan Joy Tripura
2.	Kulijoy Tripura	M	27	Farmer	Kulijoy Tripura
3.	Kathinjoy Tripura	M	46	Thumias	
4.	Arunjoy Tripura	M	35	Thumias	
5.	Behajoy Tripura	M	27	Farmer	Beha joy Tripura
6.	Khalendra Tripura	M	48	Farmer	Khalendra Tripura
7.	Resanda Tripura	M	38	Thumias	
8.	Mohanda Tripura	M	32	Fisherman	
9.	Dharen Mohan Tripura	M	20	Fisherman	Dharen Mohan Tripura
10.	Hiren Mohan Tripura	M	19	Fisherman	Hiren Mohan Tripura
11.	Jayant Mohan Tripura	M	15	Student	Jayant Mohan Tripura
12.	Chandrani Tripura	F	23	Housewife	

A. Participants details of PRA- Chaplingchara

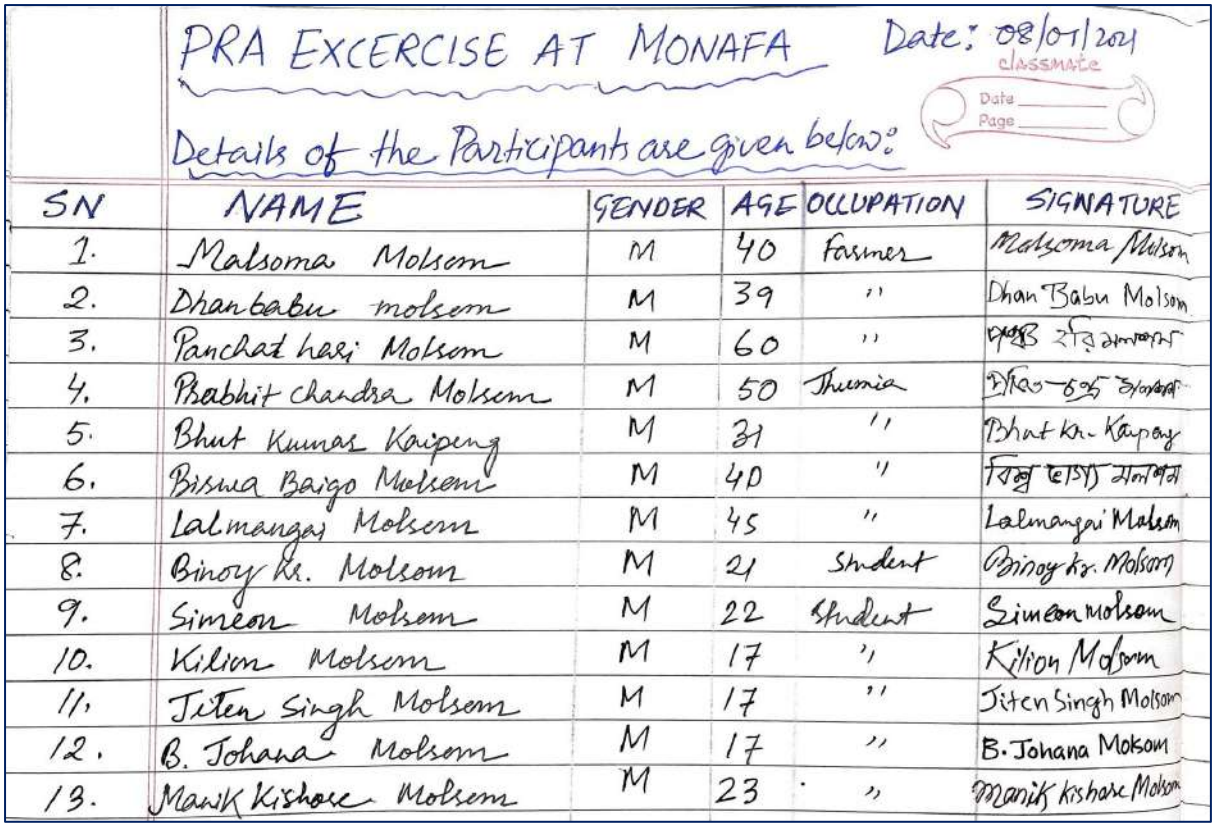


PRA EXCERCISE AT CHARANDA ROAJA PARA

Details of the Pasticipants

SN	NAME	GENDER	AGE	OCCUPATION	SIGNATORE
1.	Purna Krishna Tripura	M	54	Farmer	Purna Krishna Tripura
2.	Nabin Ks. Tripura	M	45	Fisherman	
3	Sampsada Tripura	M	48	"	
4.	Chandi charan Tripura	M	56	Farmer	
5.	Mansing Tripura	M	60	Farmer	
6.	Hapana Santal	M	55	Fishermen	Hapana Santal
7.	Rang Kumar Tripura	M	36	Farmer	Rang Kr. Tripura
8.	Pradip Kumar Tripura	M	32	"	Pradip Kr. Tripura
9.	Uttam Kumar Tripura	M	42	Fisherman	Uttam Kr. Tripura
10.	Purna mala Tripura	F	36	Housewife	
11.	Peya Tripura	F	37	"	
~~12.~~	~~Sibu Kumar Tripura~~	~~M~~			
12.	Bishu rung Tripura	F	39	"	
13.	Sibu Kumar Tripura	M	33	Farmer	Sibu Kr. Tripura

B. Participants details of PRA- Charanda roaja Para

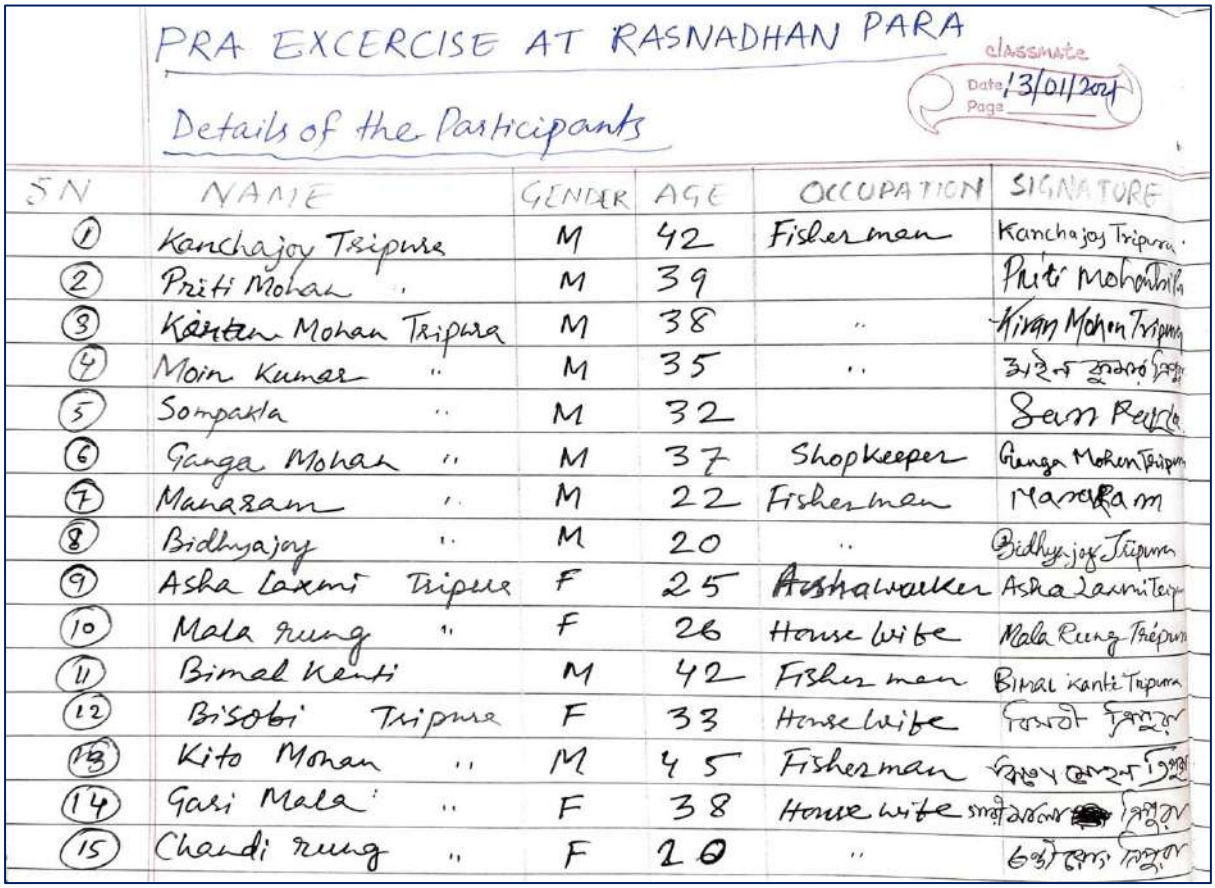


PRA EXCERCISE AT MONAFA Date: 08/01/2024

Details of the Participants are given below:

SN	NAME	GENDER	AGE	OCCUPATION	SIGNATURE
1.	Malsoma Molsom	M	40	Farmer	Malsoma Molsom
2.	Dhanbabu molsom	M	39	"	Dhan Babu Molsom
3.	Panchat hari Molsom	M	60	"	[illegible]
4.	Prabhit chandra Molsom	M	50	Thuma	[illegible]
5.	Bhut Kumar Kaipeng	M	31	"	Bhut Kr. Kaipeng
6.	Biswa Baigo Molsom	M	40	"	[illegible]
7.	Lalmangai Molsom	M	45	"	Lalmangai Molsom
8.	Binoy Kr. Molsom	M	21	Student	Binoy Kr. Molsom
9.	Simeon Molsom	M	22	Student	Simeon molsom
10.	Kilion Molsom	M	17	"	Kilion Molsom
11.	Jiten Singh Molsom	M	17	"	Jiten Singh Molsom
12.	B. Johana Molsom	M	17	"	B. Johana Molsom
13.	Manik Kishore Molsom	M	23	"	Manik kishore Molsom

C. Participants details of PRA- Monafa

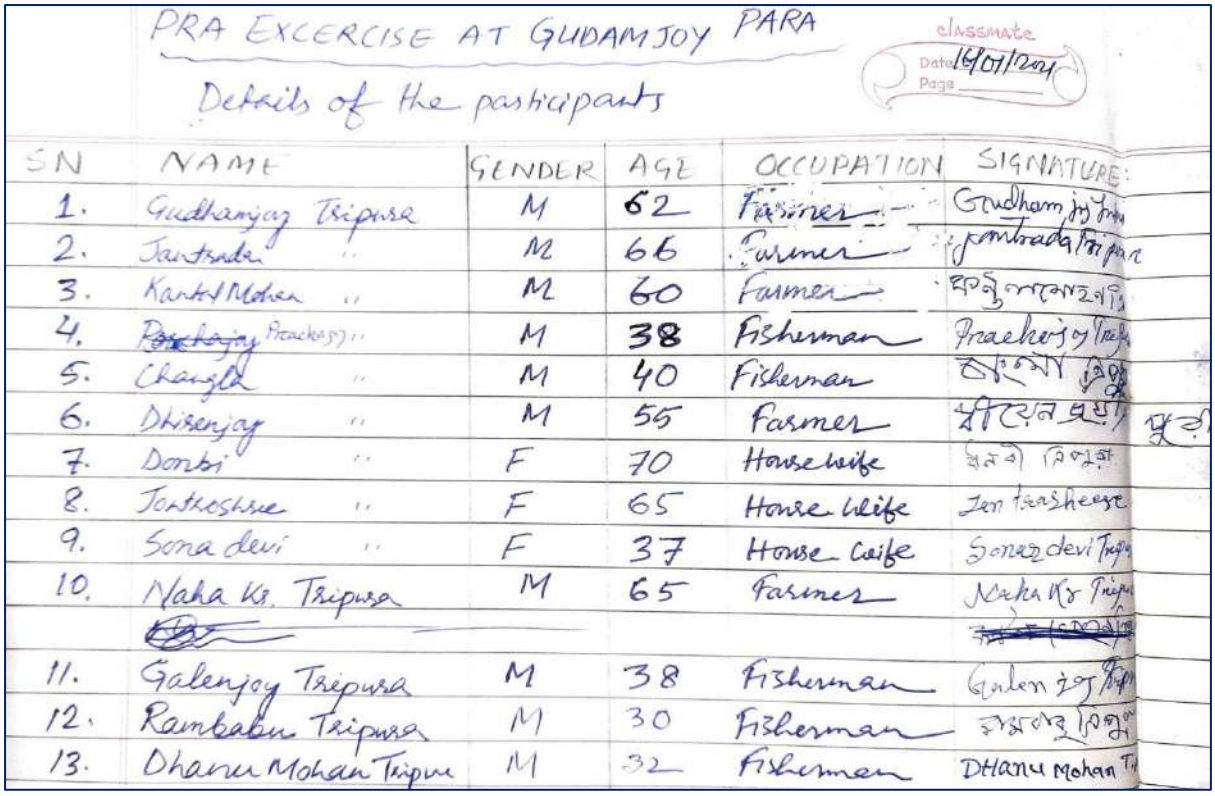


PRA EXCERCISE AT RASNADHAN PARA Date: 13/01/2024

Details of the Participants

SN	NAME	GENDER	AGE	OCCUPATION	SIGNATURE
1	Kanchajoy Tripura	M	42	Fisherman	Kanchajoy Tripura
2	Priti Mohan "	M	39		Priti Mohan Tripura
3	Kiran Mohan Tripura	M	38	"	Kiran Mohan Tripura
4	Moin Kumar "	M	35	"	[illegible]
5	Sompakla "	M	32		Sam Reang
6	Ganga Mohan "	M	37	Shopkeeper	Ganga Mohan Tripura
7	Manazam "	M	22	Fisherman	Manazam
8	Bidhyajoy "	M	20	"	Bidhyajoy Tripura
9	Asha Laxmi Tripura	F	25	Ashaworker	Asha Laxmi Tripura
10	Mala Reang "	F	26	House wife	Mala Reang Tripura
11	Bimal Kanti	M	42	Fisherman	Bimal Kanti Tripura
12	Bisobi Tripura	F	33	House wife	[illegible]
13	Kito Mohan "	M	45	Fisherman	[illegible]
14	Gari Mala "	F	38	House wife	[illegible]
15	Chandi reang "	F	20	"	[illegible]

D. Participants details of PRA- Rashnadhan Para

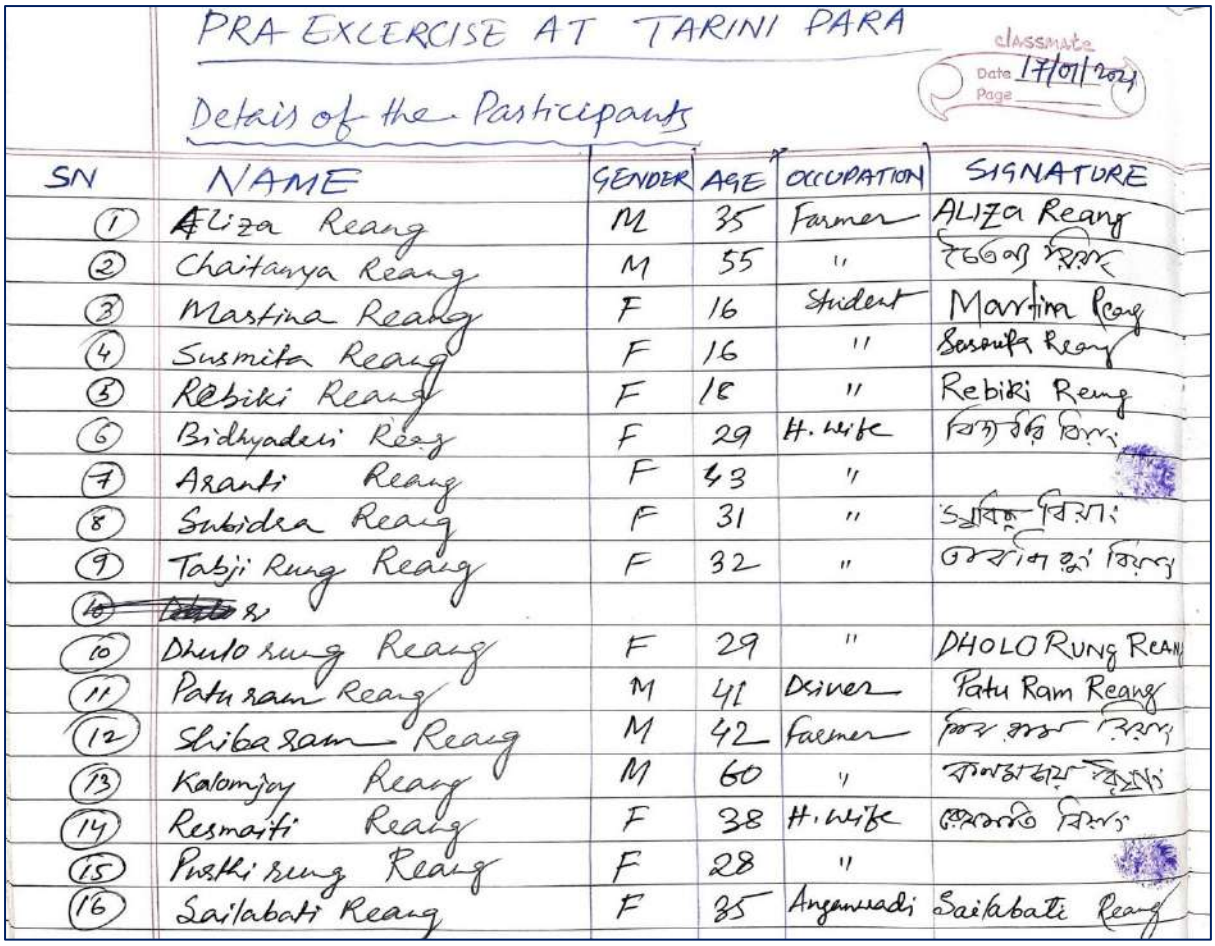


PRA EXCERCISE AT GUDAMJOY PARA

Details of the participants

SN	NAME	GENDER	AGE	OCCUPATION	SIGNATURE
1.	Gudhamjay Tripura	M	62	Farmer	Gudhamjoy Tripura
2.	Jantrada "	M	66	Farmer	jantrada Tripura
3.	Kantol Mohan "	M	60	Farmer	
4.	Prachajoy "	M	38	Fisherman	Praeherjoy Tripura
5.	Changla "	M	40	Fisherman	
6.	Dhiserjay "	M	55	Farmer	
7.	Dontsi "	F	70	Housewife	
8.	Jantreshree "	F	65	House Wife	Jantreashree
9.	Sona devi "	F	37	House Wife	Sonadevi Tripura
10.	Naha Kr. Tripura	M	65	Farmer	Naha Kr Tripura
11.	Galenjoy Tripura	M	38	Fisherman	Galen Joy Tripura
12.	Rambabu Tripura	M	30	Fisherman	
13.	Dharma Mohan Tripura	M	32	Fisherman	Dharma Mohan Tripura

E. Participants details of PRA- Gudhamjoy Para

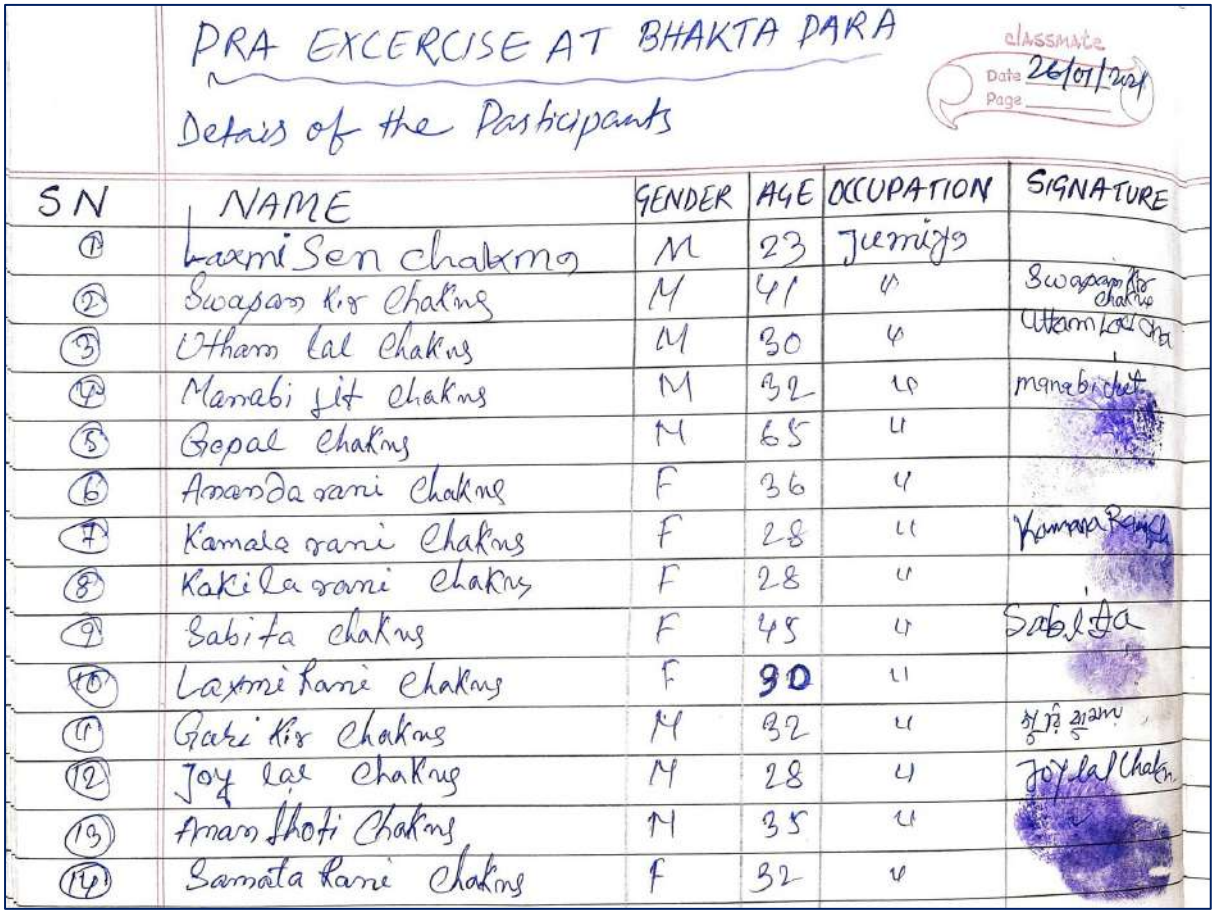


PRA EXCERCISE AT TARINI PARA

Details of the Pasticipants

SN	NAME	GENDER	AGE	OCCUPATION	SIGNATURE
(1)	Aliza Reang	M	35	Farmer	ALIZA Reang
(2)	Chaitanya Reang	M	55	"	
(3)	Mastina Reang	F	16	Student	Martina Reang
(4)	Susmita Reang	F	16	"	Susmita Reang
(5)	Rebiki Reang	F	18	"	Rebiki Reang
(6)	Bidhyadevi Reang	F	29	H. Wife	
(7)	Aranti Reang	F	43	"	
(8)	Subidra Reang	F	31	"	
(9)	Tabji Rung Reang	F	32	"	
(10)	Dhulo rung Reang	F	29	"	DHOLO RUNG REANG
(11)	Patu ram Reang	M	41	Driver	Patu Ram Reang
(12)	Shiba ram Reang	M	42	Farmer	
(13)	Kalomjoy Reang	M	60	"	
(14)	Resmaiti Reang	F	38	H. Wife	
(15)	Pushki rung Reang	F	28	"	
(16)	Sailabati Reang	F	35	Anganwadi	Sailabati Reang

F. Participants details of PRA- Tarini Para

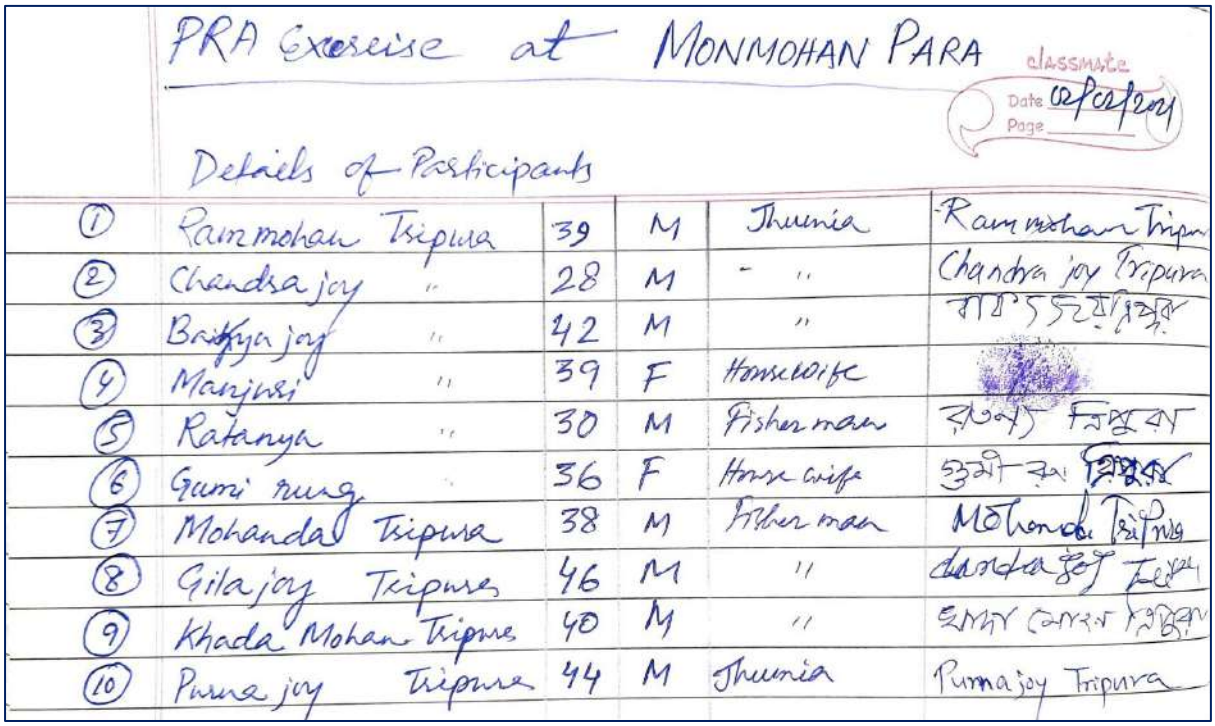


PRA EXCERCISE AT BHAKTA PARA

Details of the Participants

SN	NAME	GENDER	AGE	OCCUPATION	SIGNATURE
1	Laxmi Sen chakma	M	23	Jumijo	
2	Swapan Kir Chakma	M	41	"	Swapan Kir Chakma
3	Utham lal Chakma	M	30	"	Utham Lal Chakma
4	Manabi jit chakma	M	32	"	manabi chet
5	Gopal Chakma	M	65	"	
6	Ananda rani Chakma	F	36	"	
7	Kamala rani Chakma	F	28	"	Kamala Rani
8	Kakila rani Chakma	F	28	"	
9	Sabita chakma	F	45	"	Sabita
10	Laxmi Rani Chakma	F	90	"	
11	Gari Kir Chakma	M	32	"	[illegible]
12	Joy lal Chakma	M	28	"	Joy lal Chakma
13	Aman Thoti Chakma	M	35	"	
14	Samata Rani Chakma	F	32	"	

G. Participants details of PRA- Bhakta Para

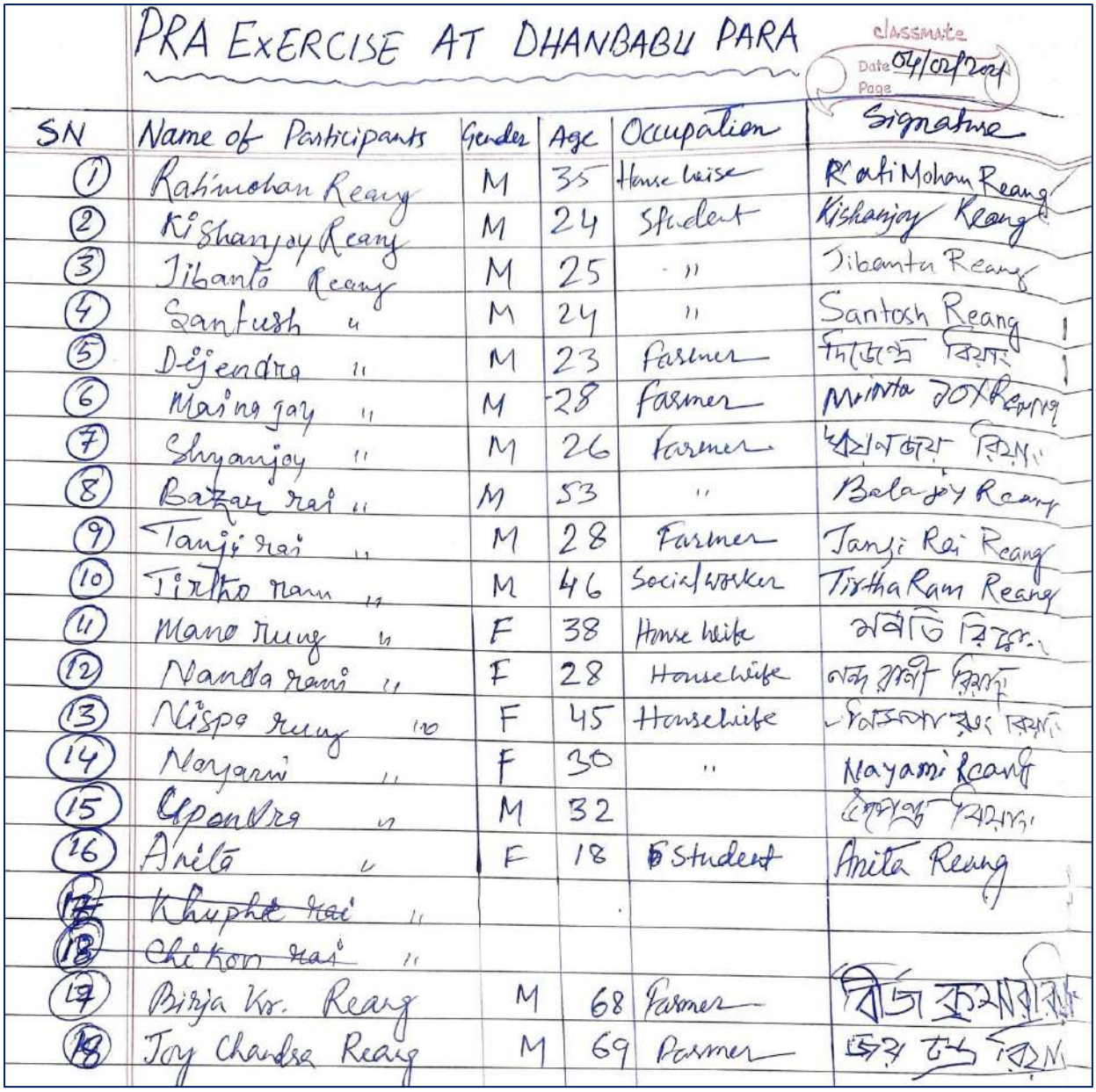


PRA Exercise at MONMOHAN PARA

Details of Participants

1	Ranmohan Tripura	39	M	Jhumia	Ranmohan Tripura
2	Chandra joy "	28	M	"	Chandra joy Tripura
3	Baijya joy "	42	M	"	[illegible]
4	Manjusri "	39	F	Housewife	
5	Ratanya "	30	M	Fisherman	[illegible]
6	Gumi rung "	36	F	House wife	[illegible]
7	Mohanda Tripura	38	M	Fisherman	Mohanda Tripura
8	Gila joy Tripura	46	M	"	[illegible]
9	Khada Mohan Tripura	40	M	"	[illegible]
10	Puma joy Tripura	44	M	Jhumia	Puma joy Tripura

H. Participants details of PRA- Manmohan Para (Gumti)



PRA EXERCISE AT DHANBABU PARA

Date 04/02/2021

SN	Name of Participants	Gender	Age	Occupation	Signature
1	Rabimohan Reang	M	35	House Wife	Rabi Mohan Reang
2	Kishanjay Reang	M	24	Student	Kishanjay Reang
3	Jibanto Reang	M	25	"	Jibanto Reang
4	Santush "	M	24	"	Santosh Reang
5	Dijendra "	M	23	Farmer	দিজেন্দ্র রিয়াং
6	Maingay "	M	28	Farmer	Mainta JOY Reang
7	Shyanjoy "	M	26	Farmer	শ্যামজয় রিয়াং
8	Bazar rai "	M	53	"	Balajoy Reang
9	Tanji rai "	M	28	Farmer	Tanji Rai Reang
10	Tirtho ram "	M	46	Social worker	Tirtha Ram Reang
11	Mano Rung "	F	38	House Wife	মনোরঞ্জন রিয়াং
12	Nanda rani "	F	28	Housewife	নন্দ রানী রিয়াং
13	Nispa Rung "	F	45	Housewife	নিষ্পা রিয়াং
14	Nayani "	F	30	"	Nayani Reang
15	Upendra "	M	32		উপেন্দ্র রিয়াং
16	Anita "	F	18	Student	Anita Reang
~~17~~	~~Khuphe rai~~ "				
~~18~~	~~Chikon rai~~ "				
17	Birja Kr. Reang	M	68	Farmer	বীর্জ কুমার রিয়াং
18	Joy Chandra Reang	M	69	Farmer	জয় চন্দ্র রিয়াং

I. Participants details of PRA- Dhababu Para

ANNEXURE-9

FORMATION OF ECOTOURISM MANAGEMENT COMMITTEE AT TARINI PARA

PROCEEDINGS OF MEETING

TariniReangpara, Pancharatan ADC Village

Date: 17/02/2020, Time: 6:50pm

Place: Residence of JoysingReang

RESOLUTION

Today, 17th February, 2020 (Saturday) a meeting was held at the residence of Mr. JoysingReang, Secretary of Tarini para Baptist Church based on the previous meeting on 06/02/2020, 09/02/2020 & 10/02/2020 with the officials from NMHS Project, TU for the creation of Homestay for conservation-based tourism in our village. Mr. Chatoinya Reang was chosen as the Chaiman of the Meeting and the discussion started with the word of Prayer by the Chairman himself. Mr. RamjoyReang, Chowdhury of Tarini para was also present in the meeting. Based on the idea of the project briefed by Dr. Thiru Selvan, PI of the project and Mr. Kiran Kr. Murasing, JPF of the Project on the previous meetings we had long discussion regarding the matter and based on the discussion following decision were made in mutual understanding:

1. With majority support we have decided to take over the work for establishing Homestay in our village. We have decided that only a person who come willingly to be a member of the society will be part of it.
2. We have decided to keep the name of the Society as **Leinghoihthai**
3. The construction of cottage (Eco-hut) will be started from tomorrow i.e, 18/02/2020.
4. A committee has been formed for the management of the society which is below in the table.
5. The committee will have the power to add or remove a member from the society as per the performance of individual.
6. Every member of the society must abide by the Rules and Regulation of the society.
7. For the financial support from NMHS for building Eco-Hut we have chosen a Bank Account of Mrs. SAILABATI REANG

   A/C: 8094012330345 (Tripura Gramin Bank); Branch:GandacherraIFSC: UTBI0RRBTGB; UID No: 516802791802

COMMITTEE MEMBERS

SN	NAME	GENDER	DESIGNATION	SIGNATURE
1	ChatoinyaReang	M	President	
2	TustaramReang	M	Vice-President	
3	JoysingReang	M	Secretary	
4	LalnunmaiwiaReang	M	Asst. Secretary	
5	SailabatiReang	F	Cashier	
6	RamjoyReang	M	Member	
7	Jarphan rai Reang	M	Member	
8	SuchindraReang	M	Member	
9	SukunraiReang	M	Member	
10	BirchandraReang	M	Member	
11	SiboramReang	M	Member	
12	Aliza Reang	M	Member	
13	KhajiramReang	M	Member	
14	NipendraReang	M	Member	
15	ChakramaniReang	M	Member	

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OTHER MEMBERS OF THE SOCIETY

SN	NAME	GENDER	SIGNATURE
16	NagadiReang (BA)	M	Nagadi Reang.
17	Bikram Tripura	M	Bikram Tripura
18	NamenjoyReang (BA)	M	Namen Joy Reang
19	Aijak rai Reang	M	[illegible]
20	MastanjoyReang	M	[illegible]
21	SithakraiReang	M	Sithakrai Reang
22	Khobi rung Reang	F	Khobi run Reang
23	Jitendra Reang	M	[illegible]
24	Khanda rai Reang	M	Khandarai Reang
25	RantajoyReang	M	Ratan Joy Reang
26	Khanda ram Reang	M	Khanda ram Reang
27	ResmointiReang	F	[illegible]
28	Potu ram Reang	M	Paturam Reang
29	Rati rai Reang	M	Rati rai Reang
30	Kamala batiReang	F	[illegible]
31	Amdoi rai Reang	M	[illegible]
32	KamendraReang	M	[illegible]
33	KolanjoyReang	M	[illegible]
34	ChurabatiReang	F	[illegible]
35	NajiramReang	M	Najir Ron Reang
36	Durba joy Reang	M	Dur ba Joy Reang
37	BrajakumarReang	M	Braja Kr. Reang
38	Songa ram Reang	M	Songa ram Reang
39	KaishopaReang	M	[illegible]
40	JanamohanReang	M	Janamohan Reang
41	Chabi rung Reang	F	[illegible]
42	Pusha ram Reang	M	Pusha ram Reang
43	NibedanReang	M	Nibedan Reang

The meeting ended with the word of encouragement and prayer by Mr. ChatoinyaReang, President of the Society.

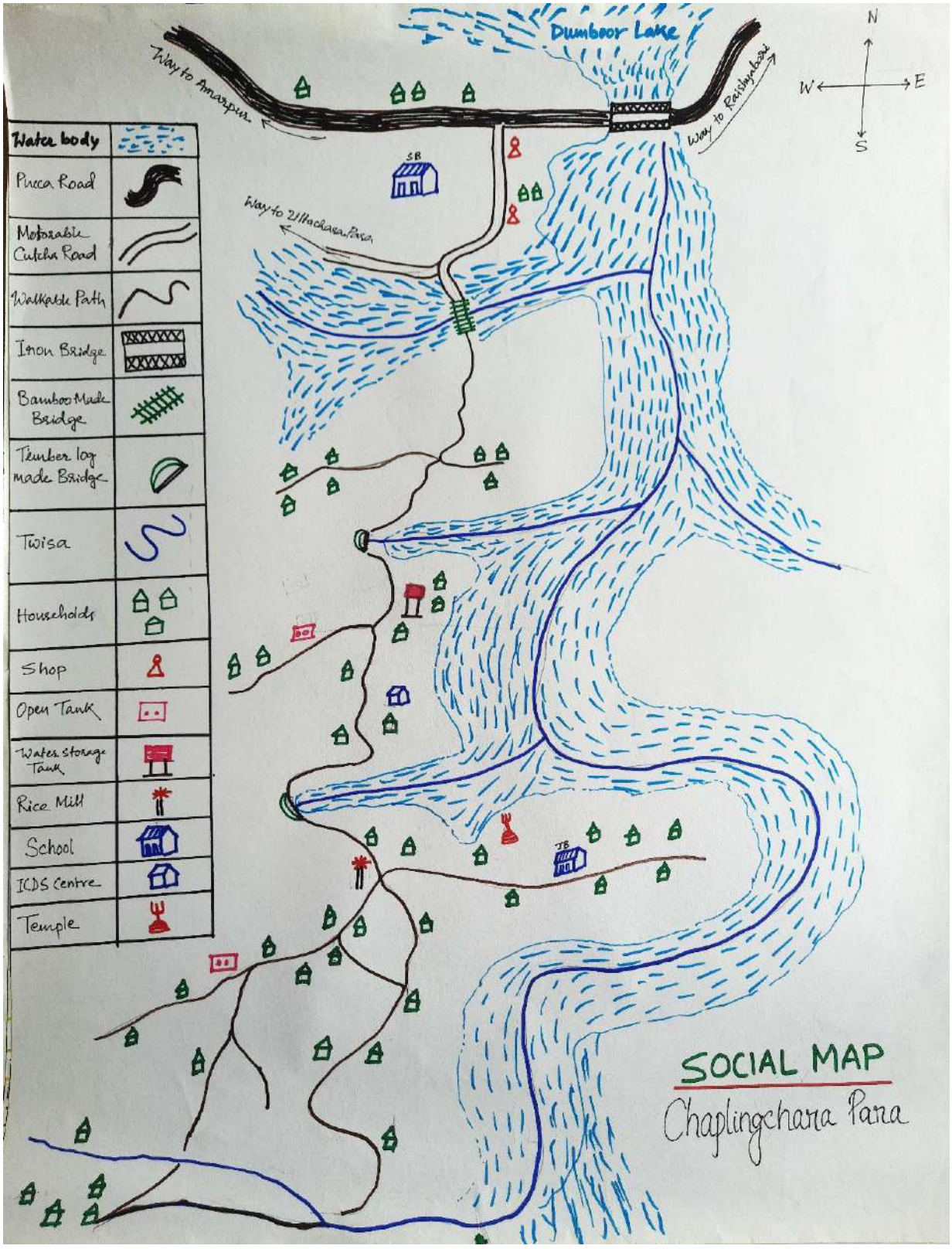
[illegible] Chowdhury | [illegible] President | Jong Sing Reang Secretary

(page-2)

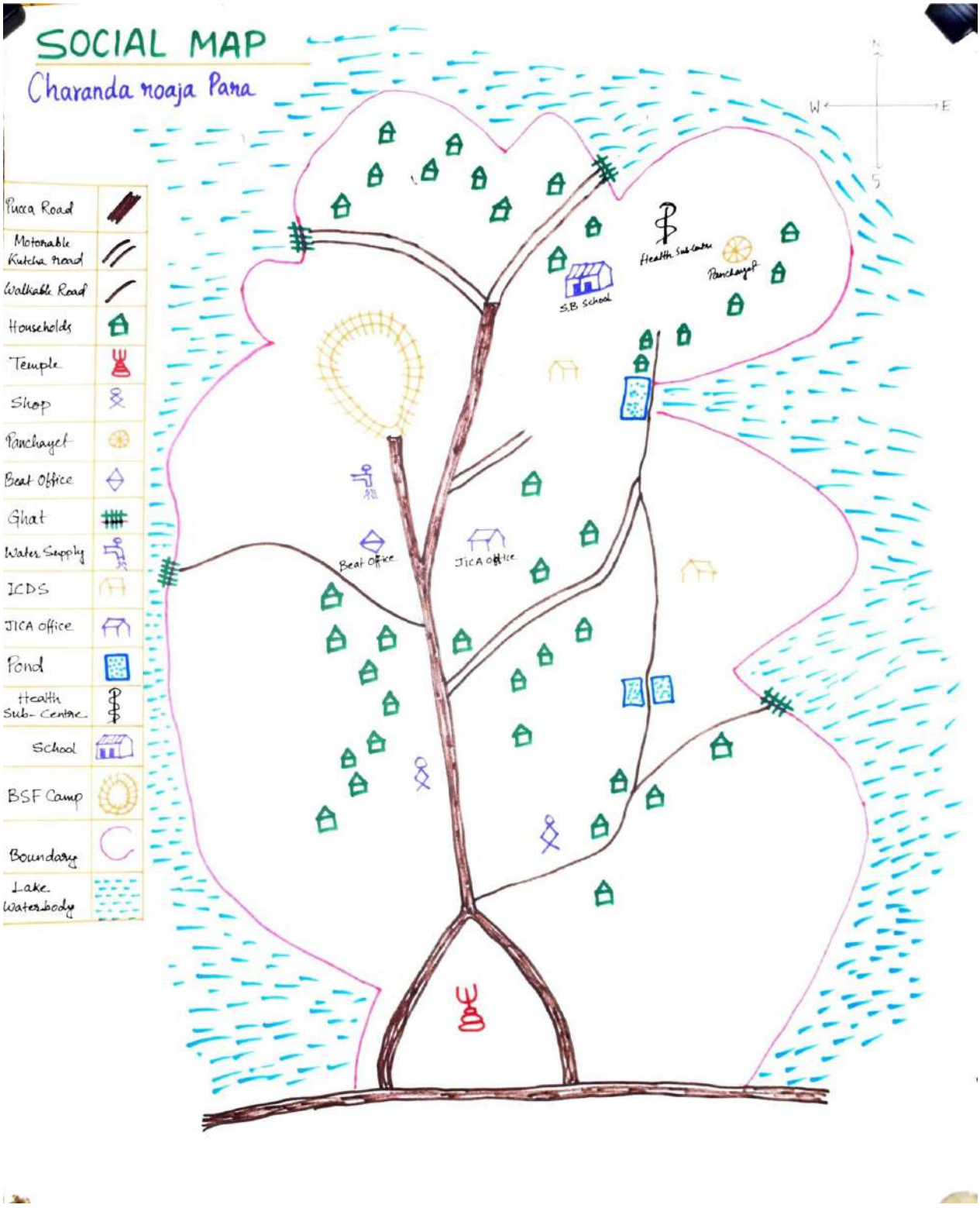
ANNEXURE-10

OUTCOME OF PRA EXERCISE CONDUCTED AT VARIOUS LOCATIONS

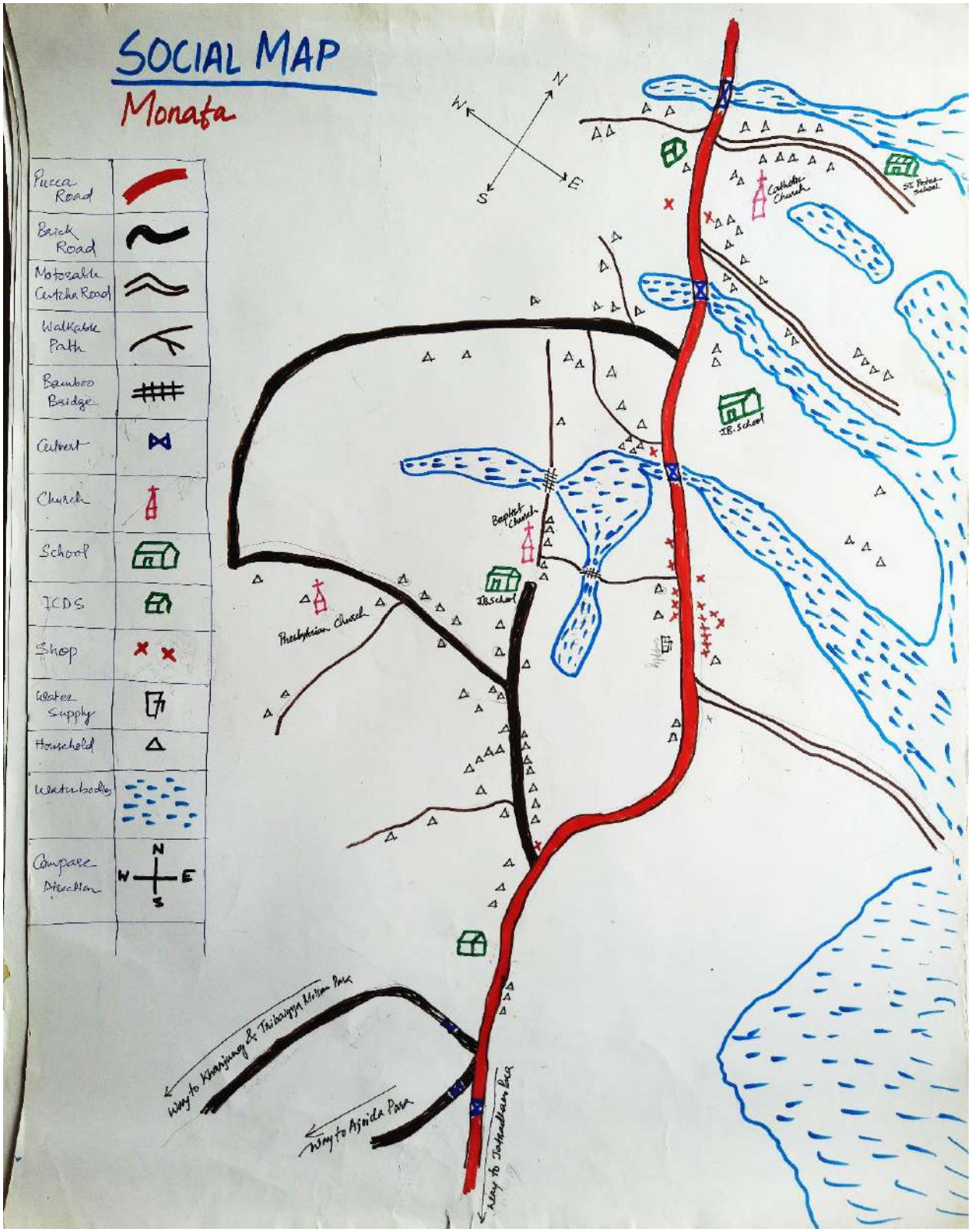
1A. Social Map- Chaplingchara



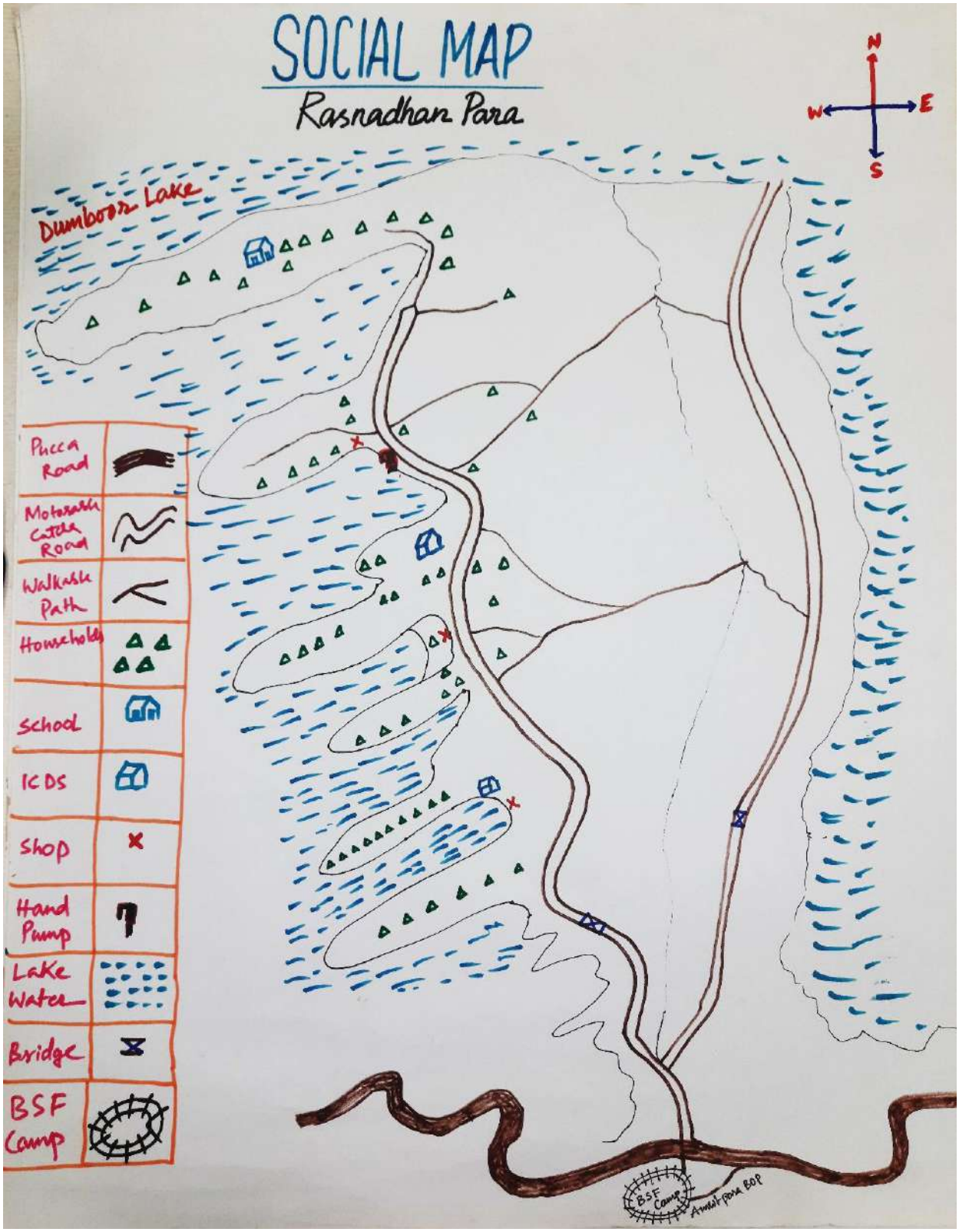
1B. Social Map- Charanda Roaja para



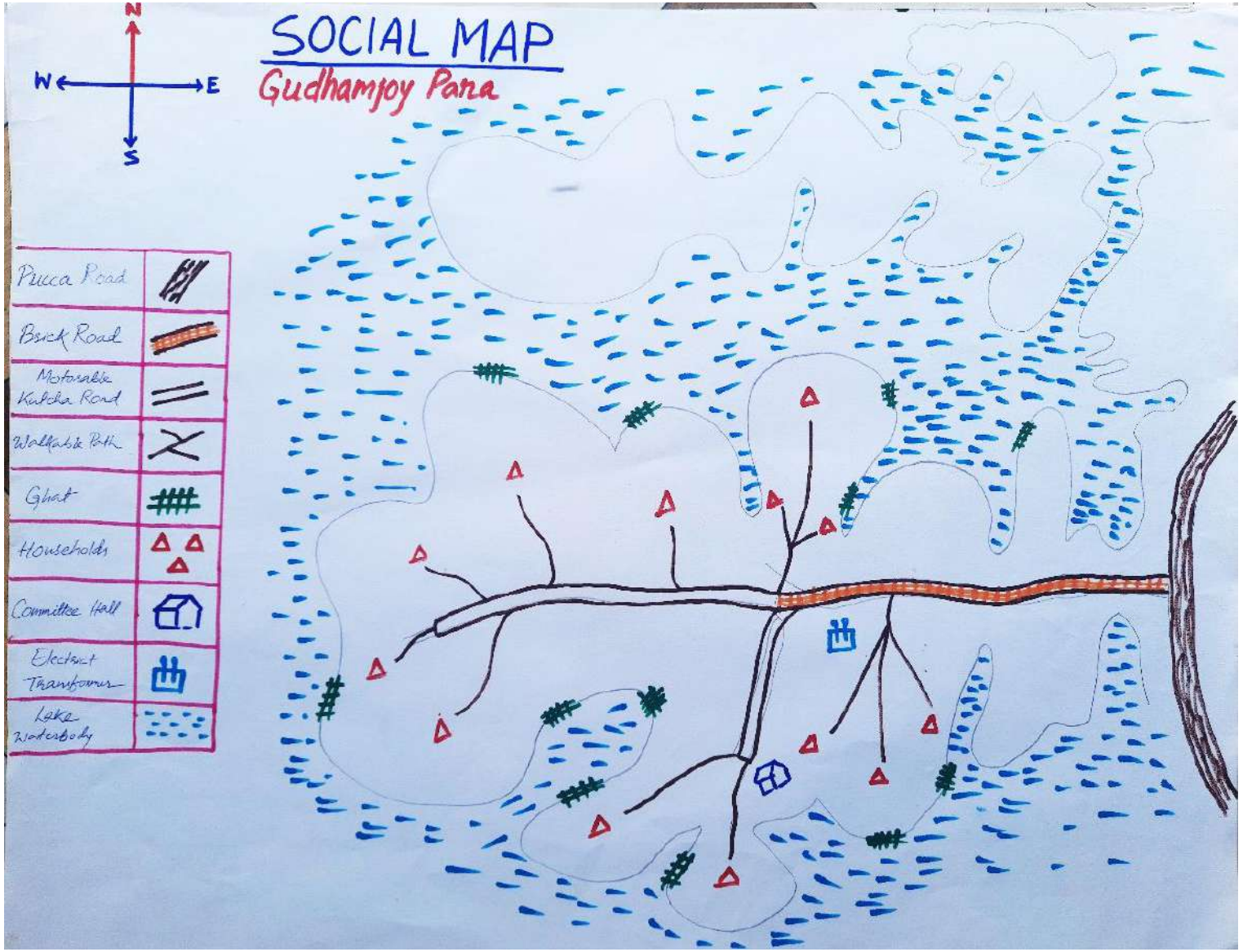
1C. Social Map- Monafa



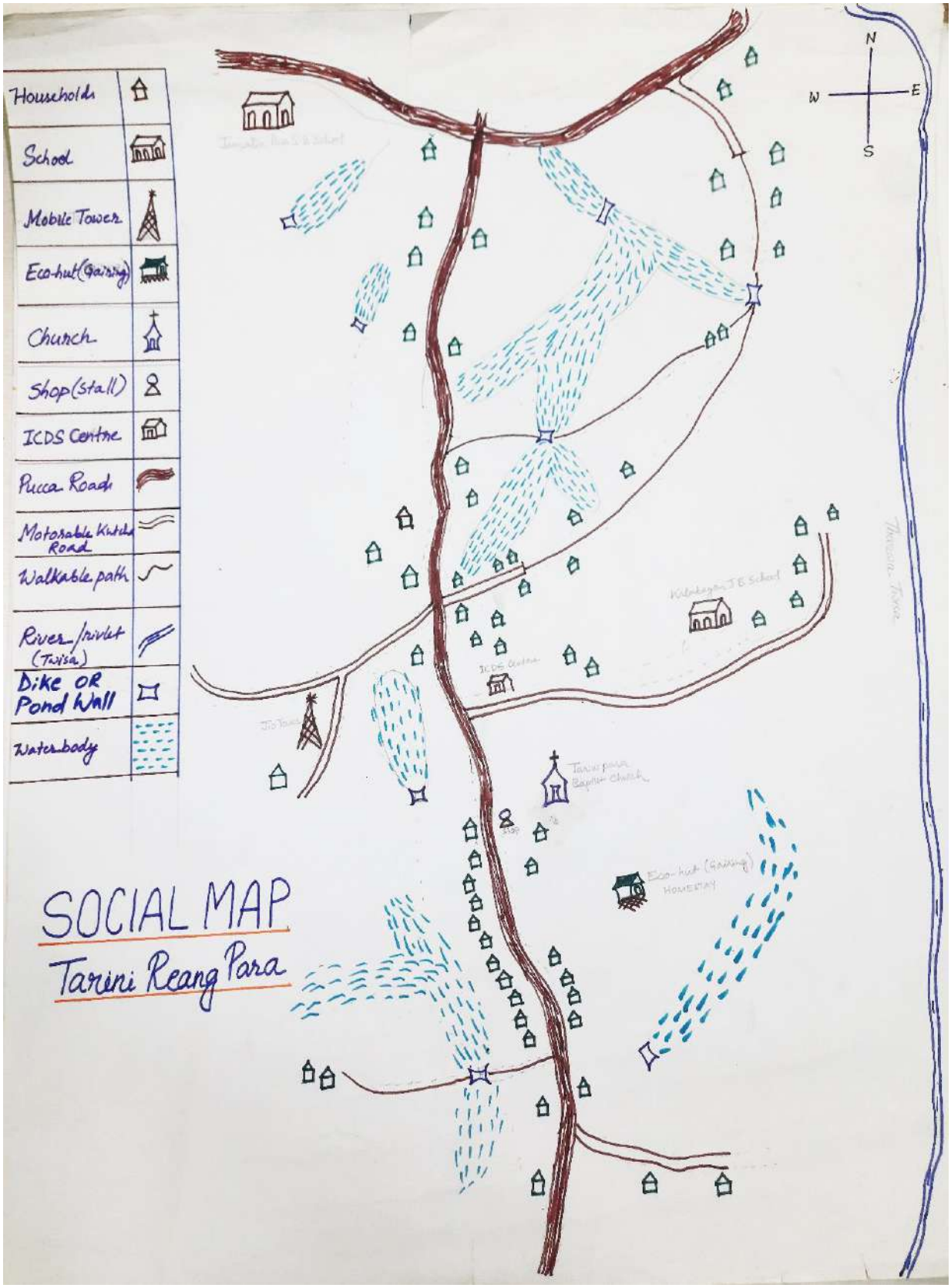
1D. Social Map- Rasnadhan Para



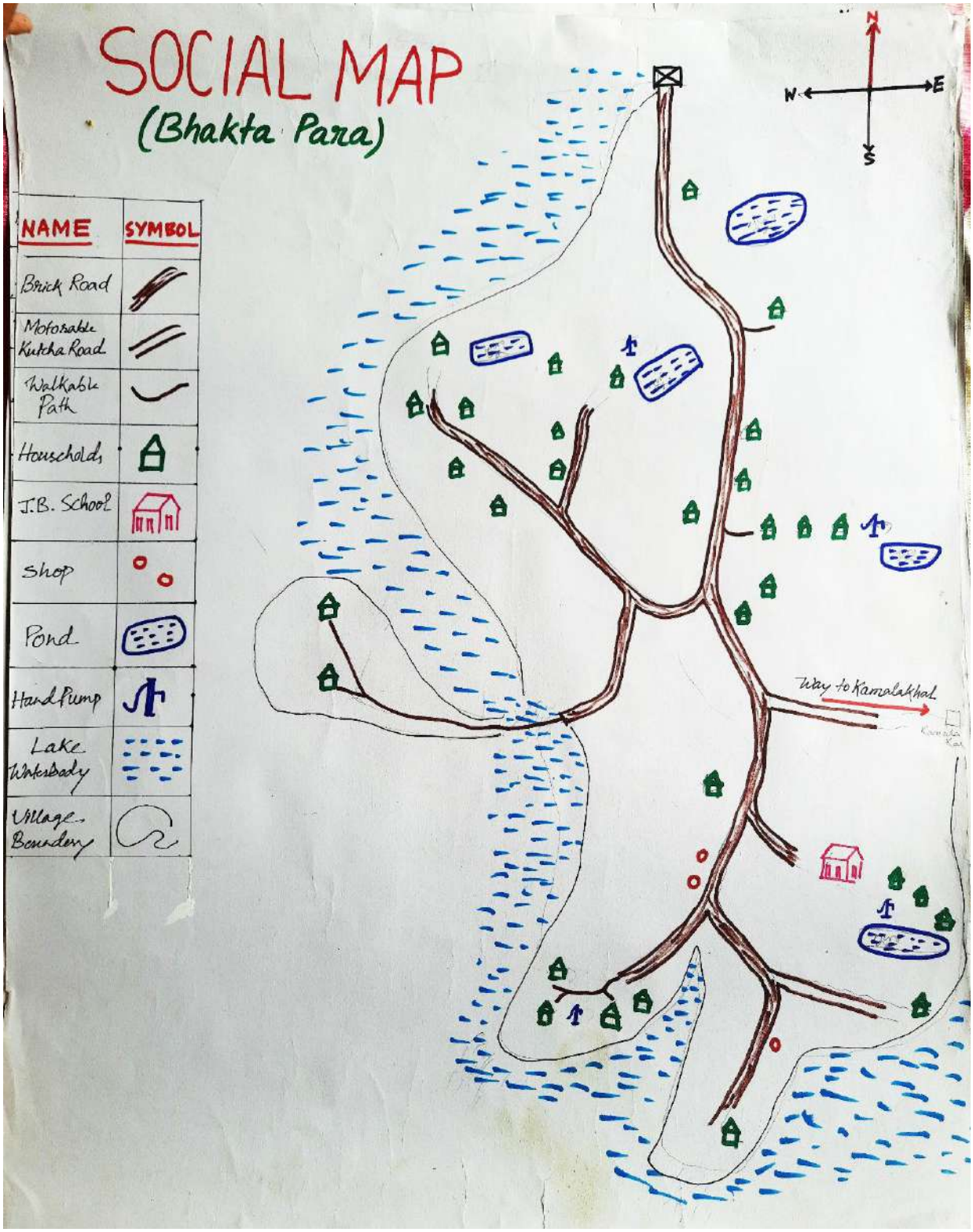
1E. Social Map- Gudhamjoy Para



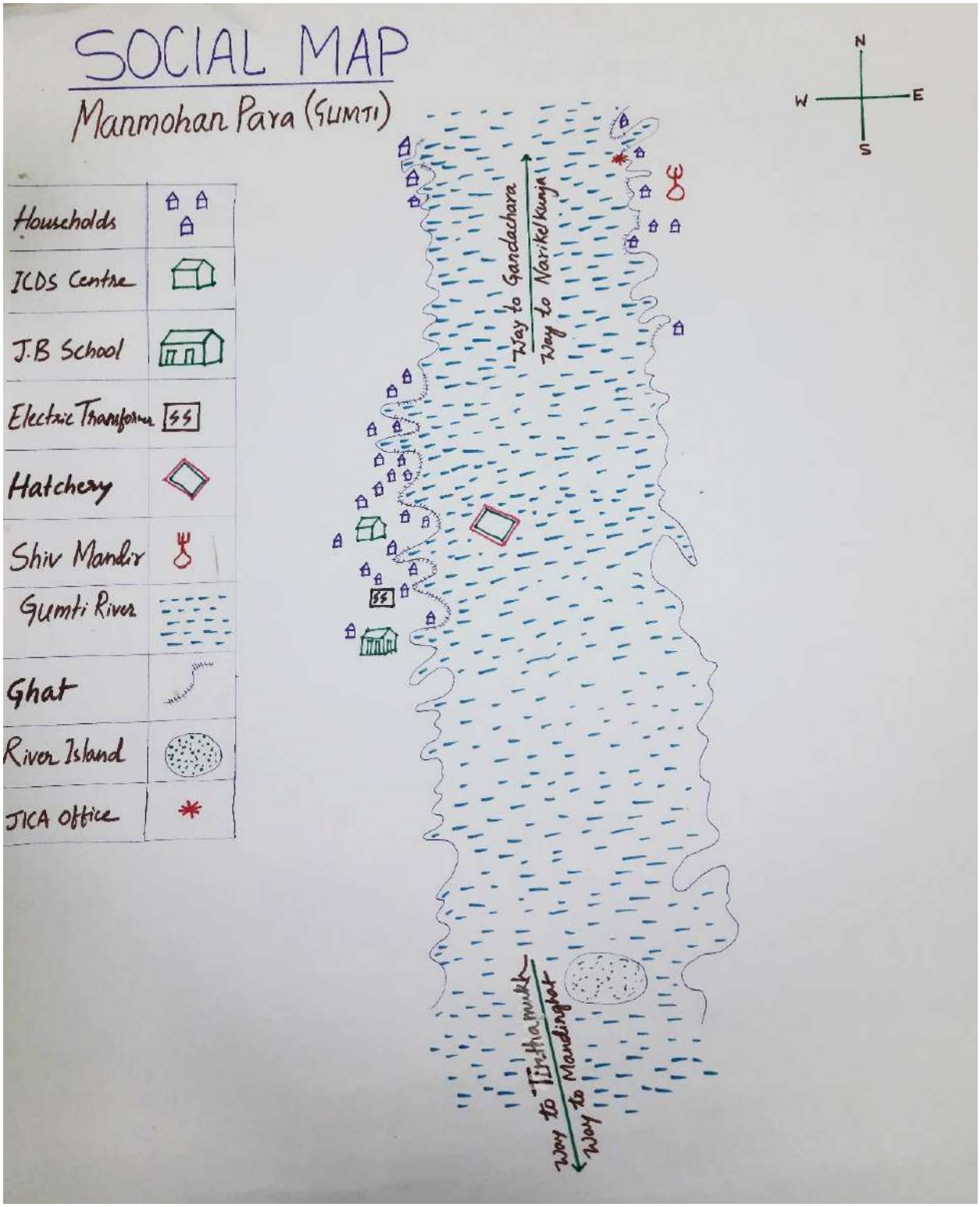
1F. Social Map- Tarini Para



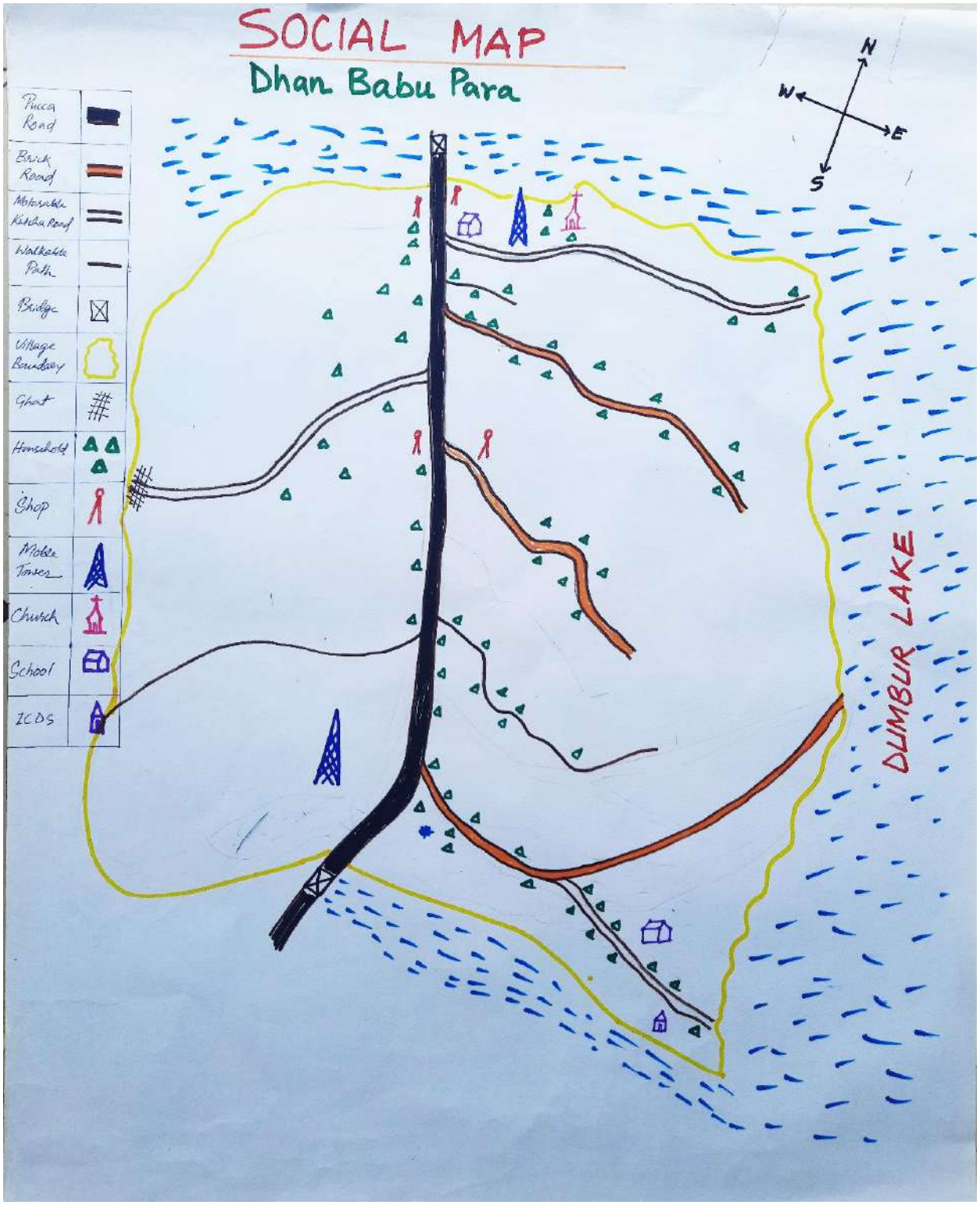
1G. Social Map- Bhakta Para



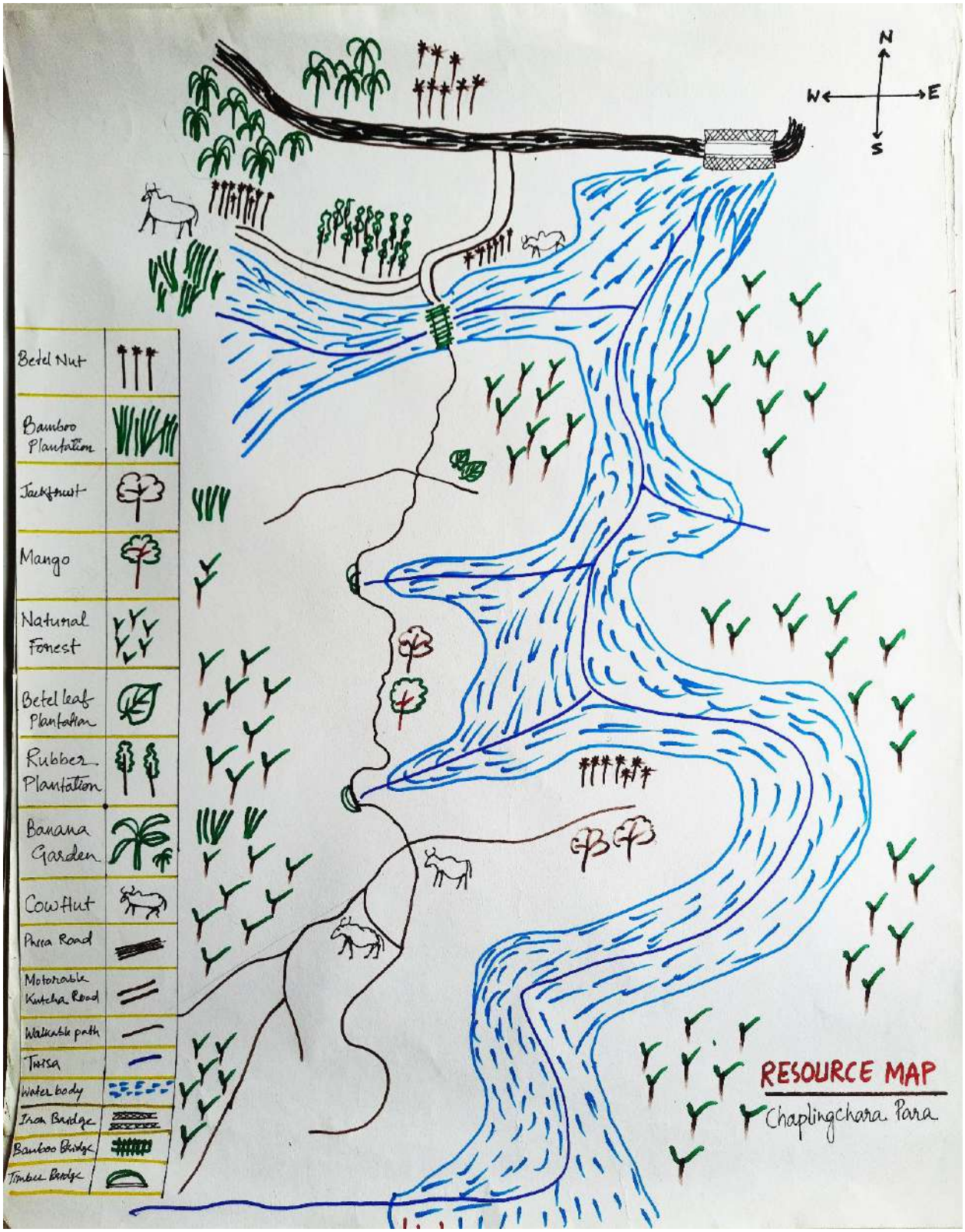
1H. Social Map- Monmohan Para



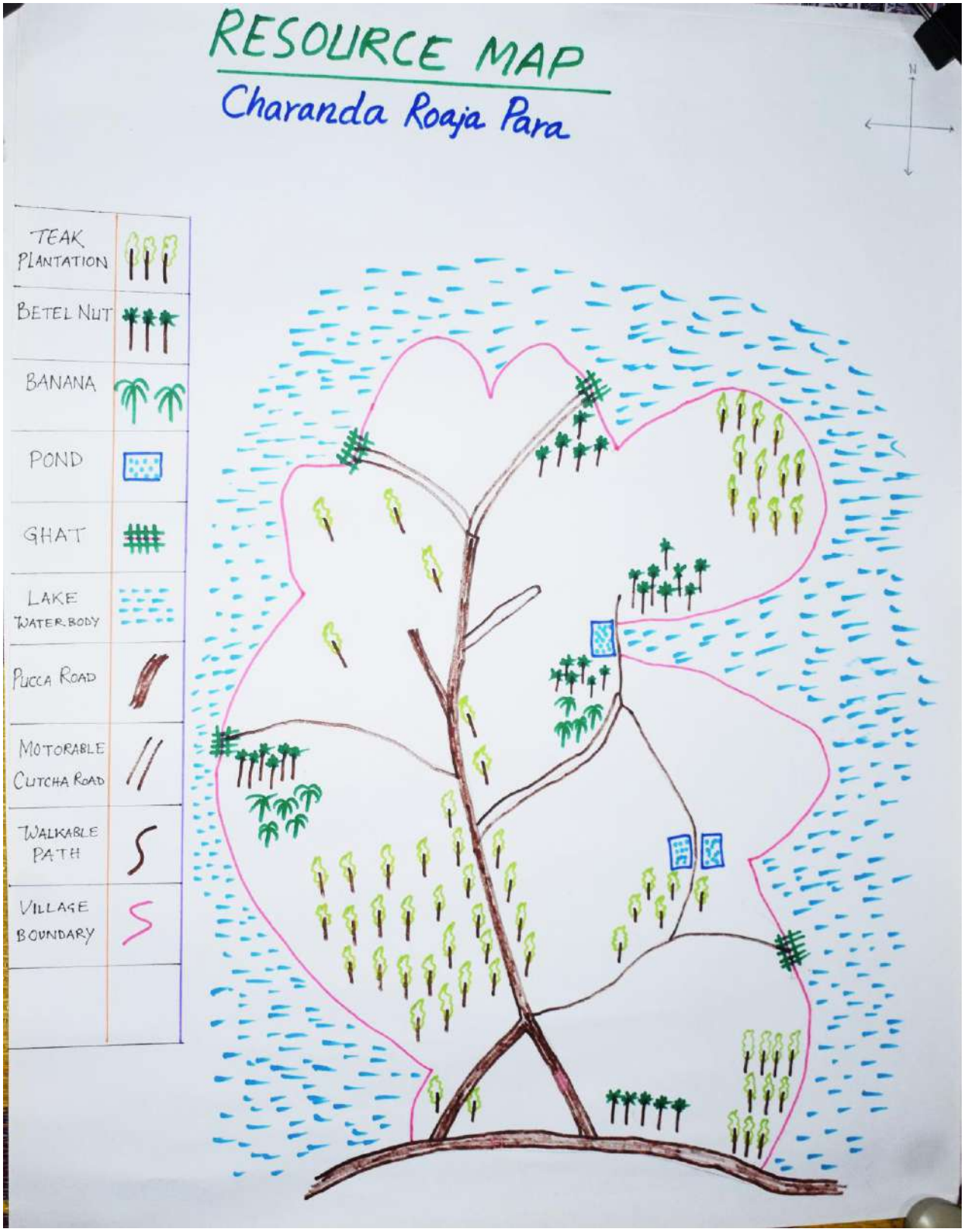
1I. Social Map- Dhanbabu Para



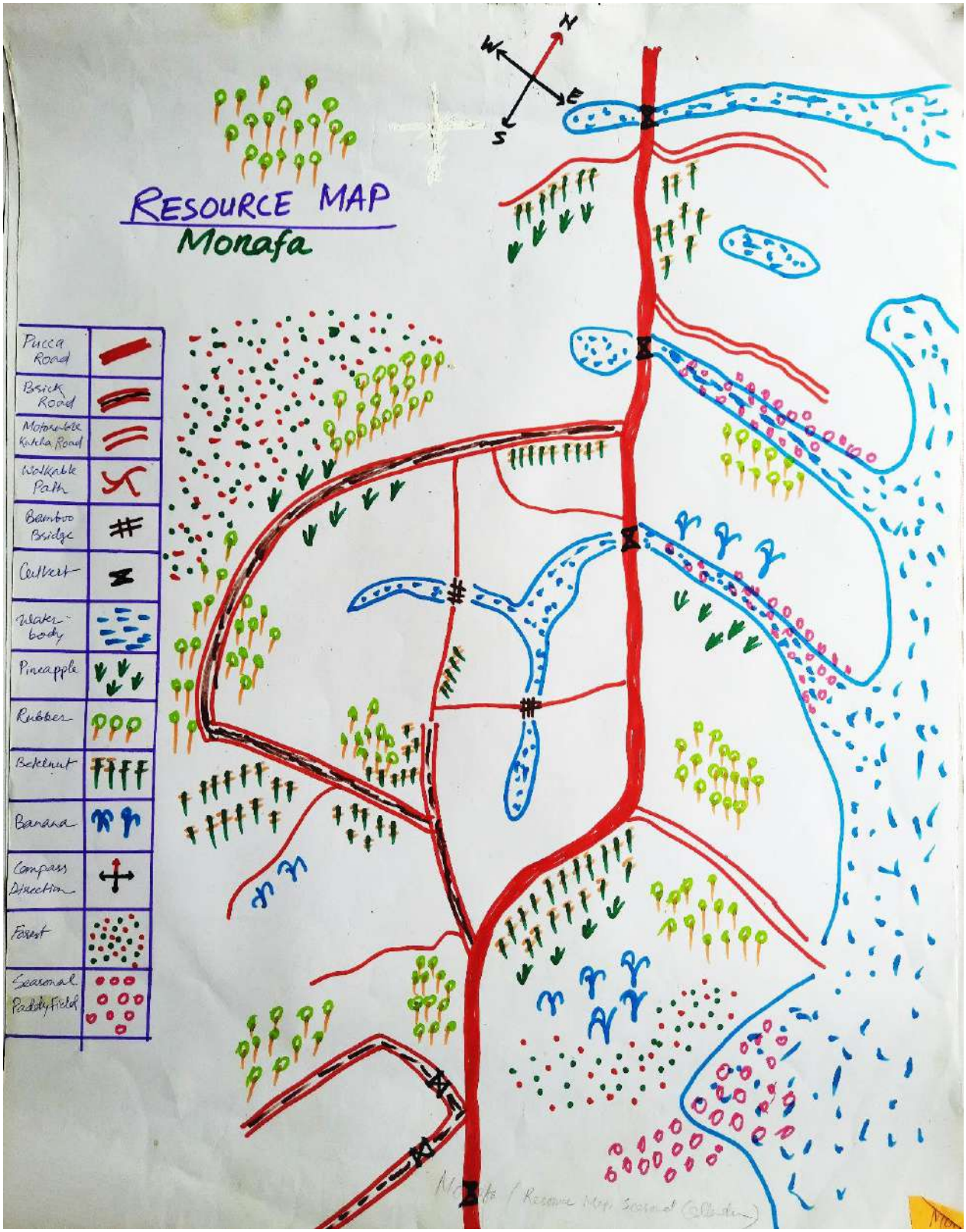
2A. Resource Map- Chaplingchara



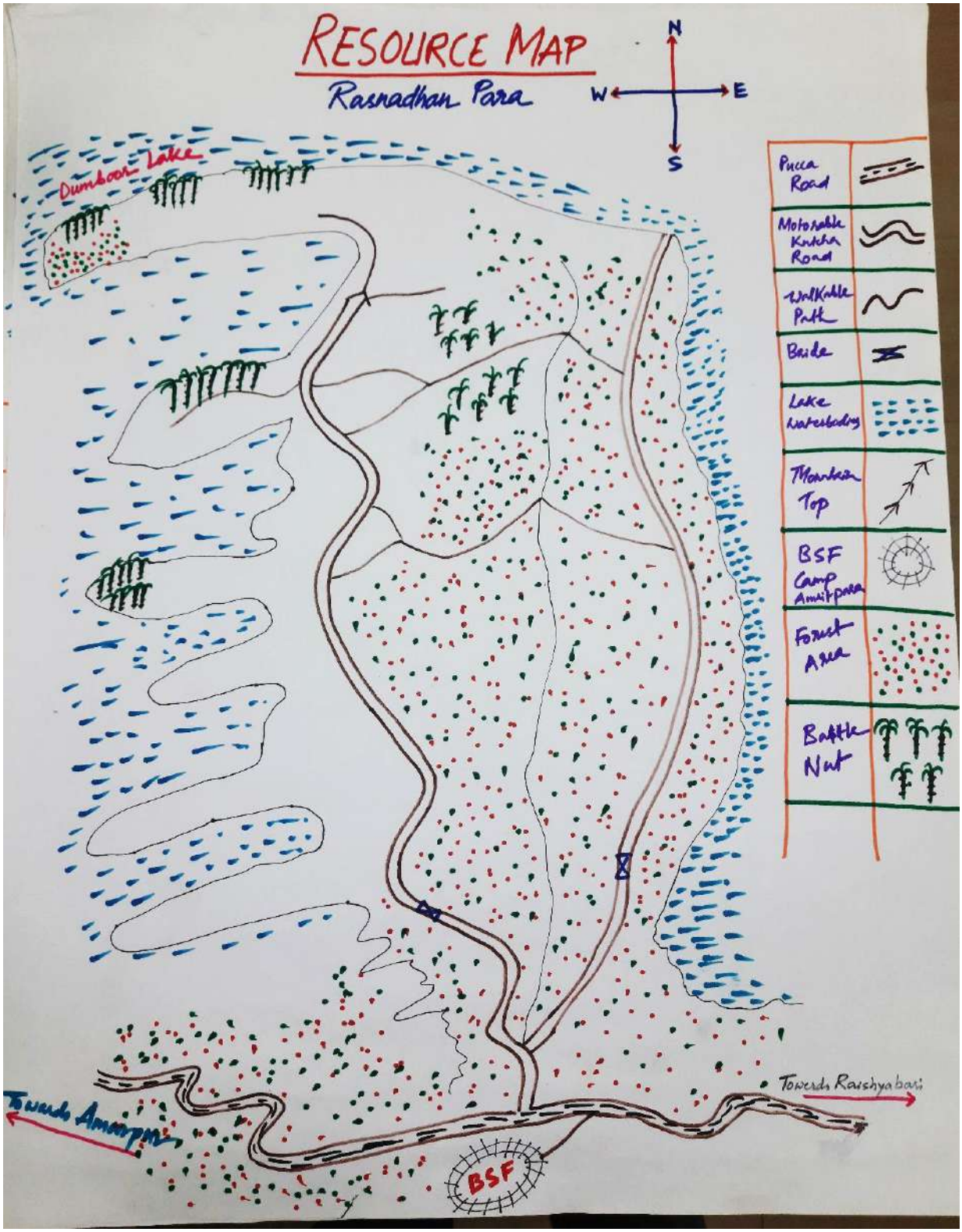
2B. Resource Map- Charanda Roaja para



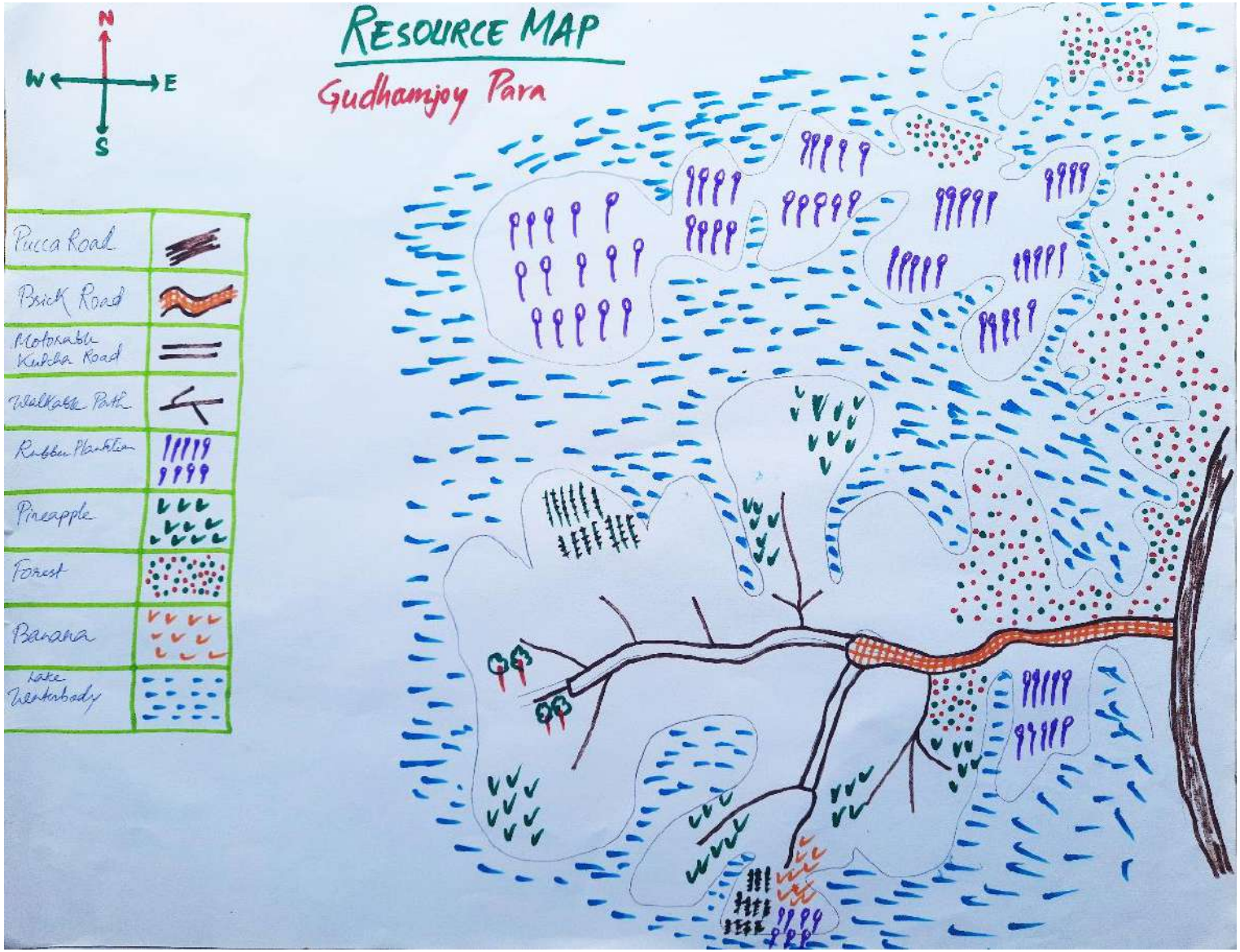
2C. Resource Map- Monafa



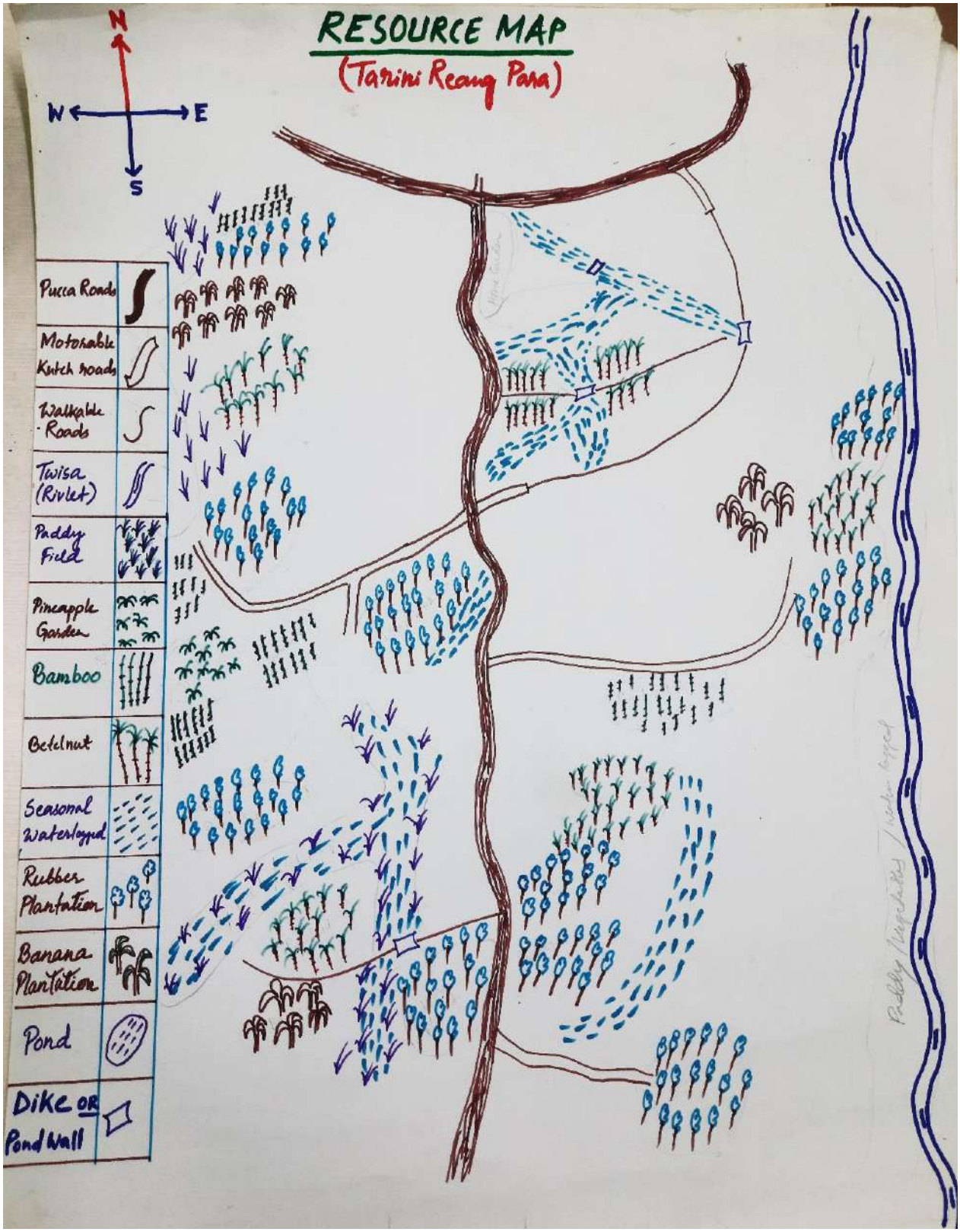
2D. Resource Map- Rasnadhan Para



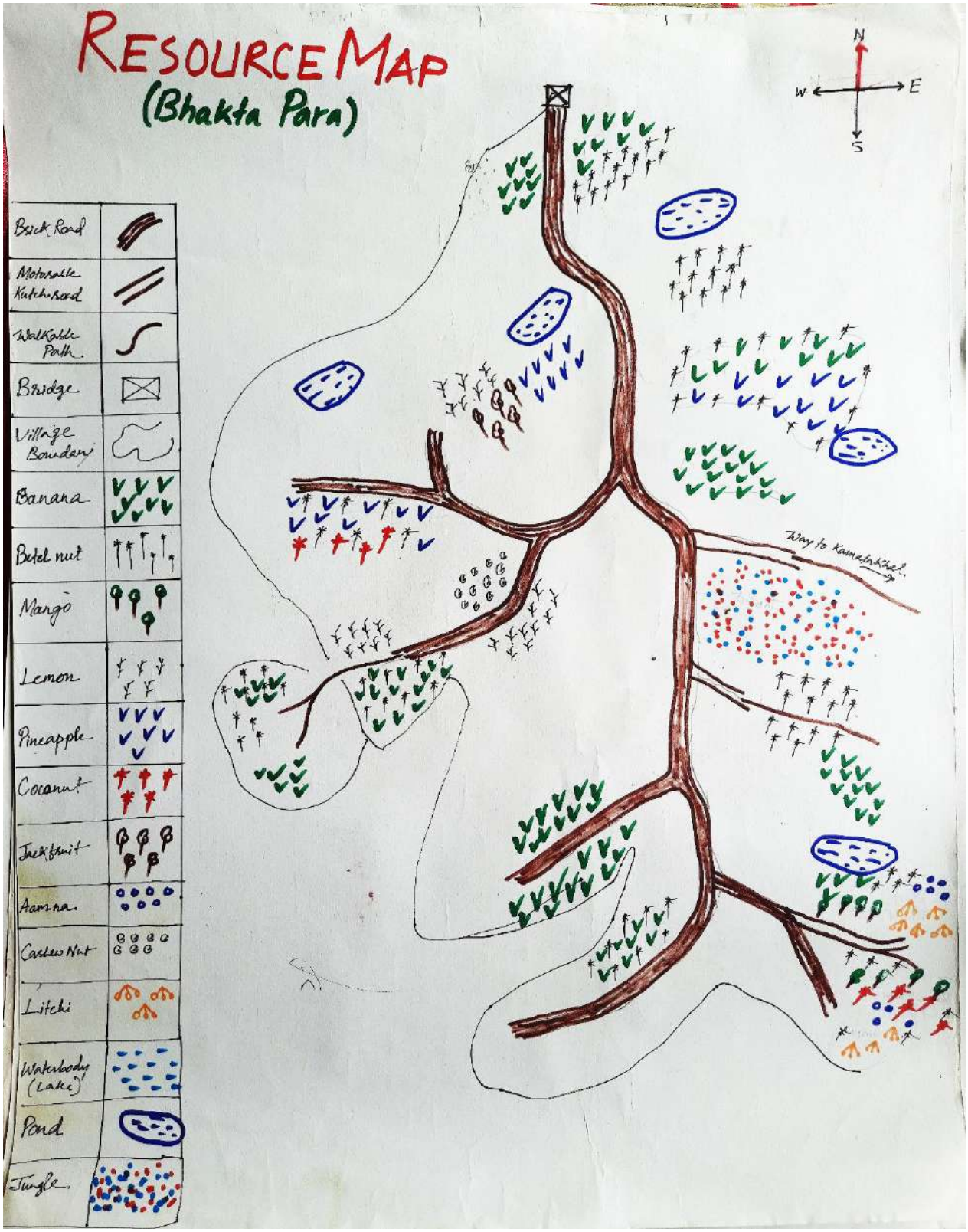
2E. Resource Map- Gudhamjoy Para



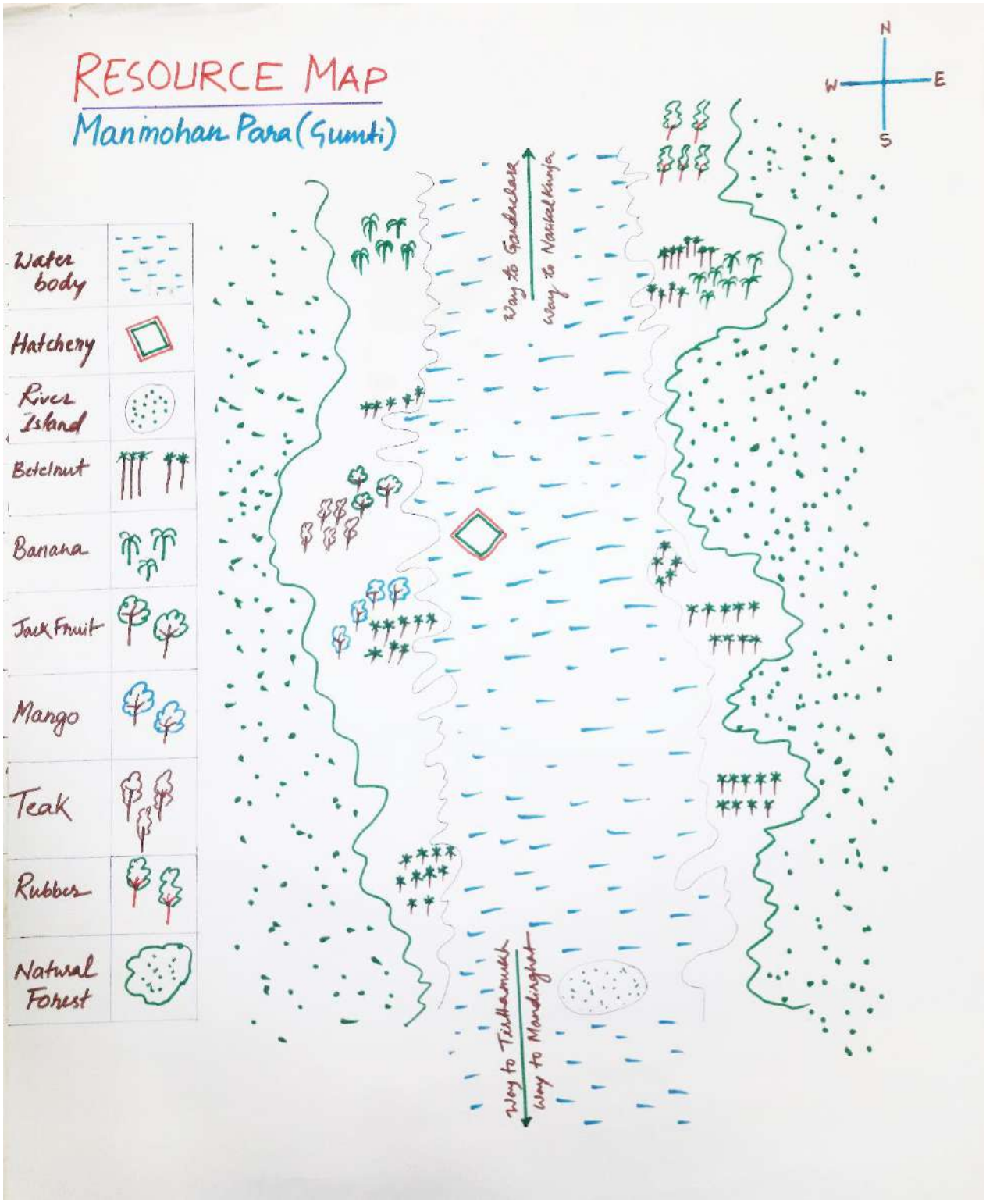
2F. Resource Map- Tarini Para



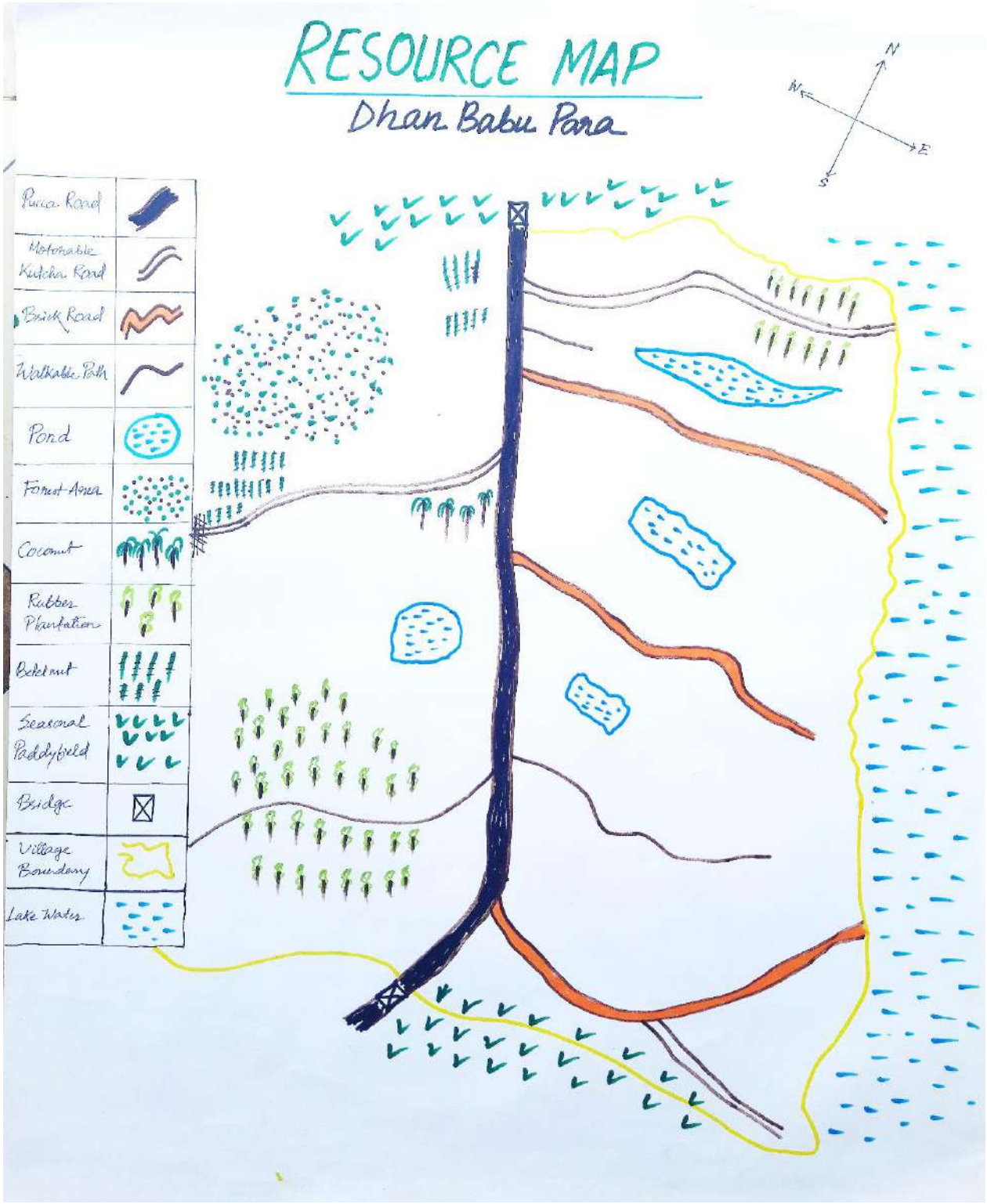
2G. Resource Map- Bhakta Para



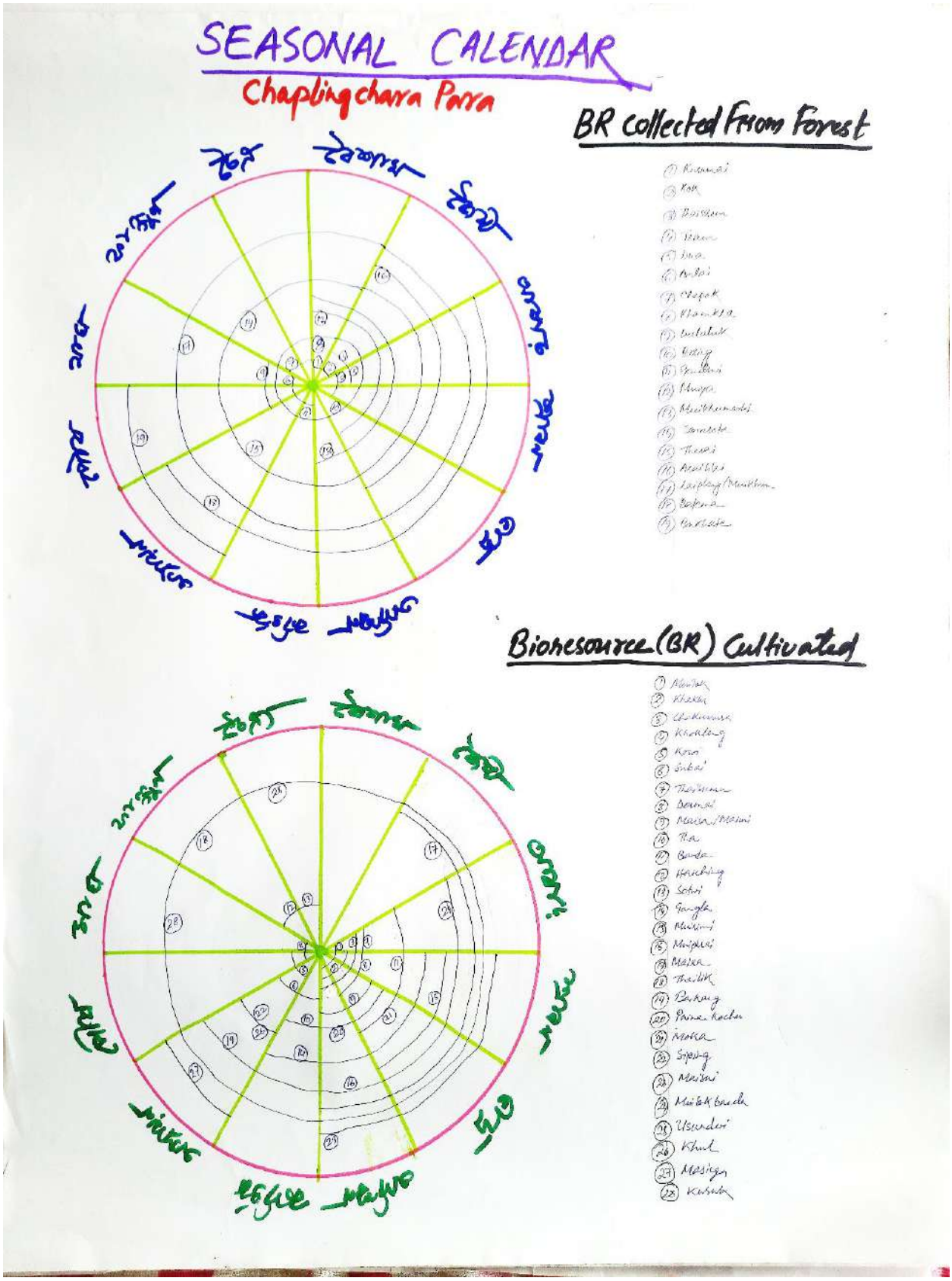
2H. Resource Map- Monmohan Para



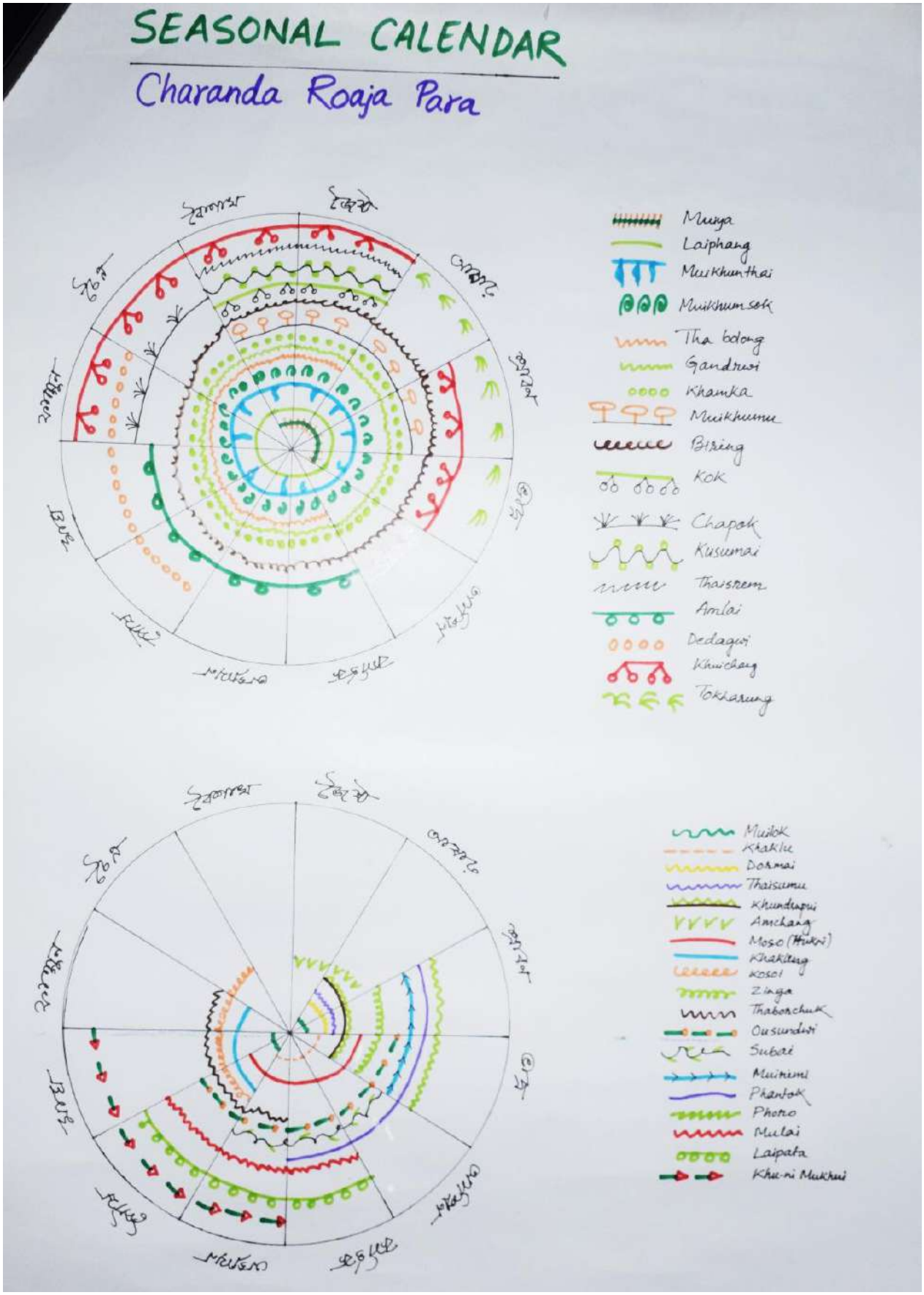
2I. Resource Map- Dhanbabu Para



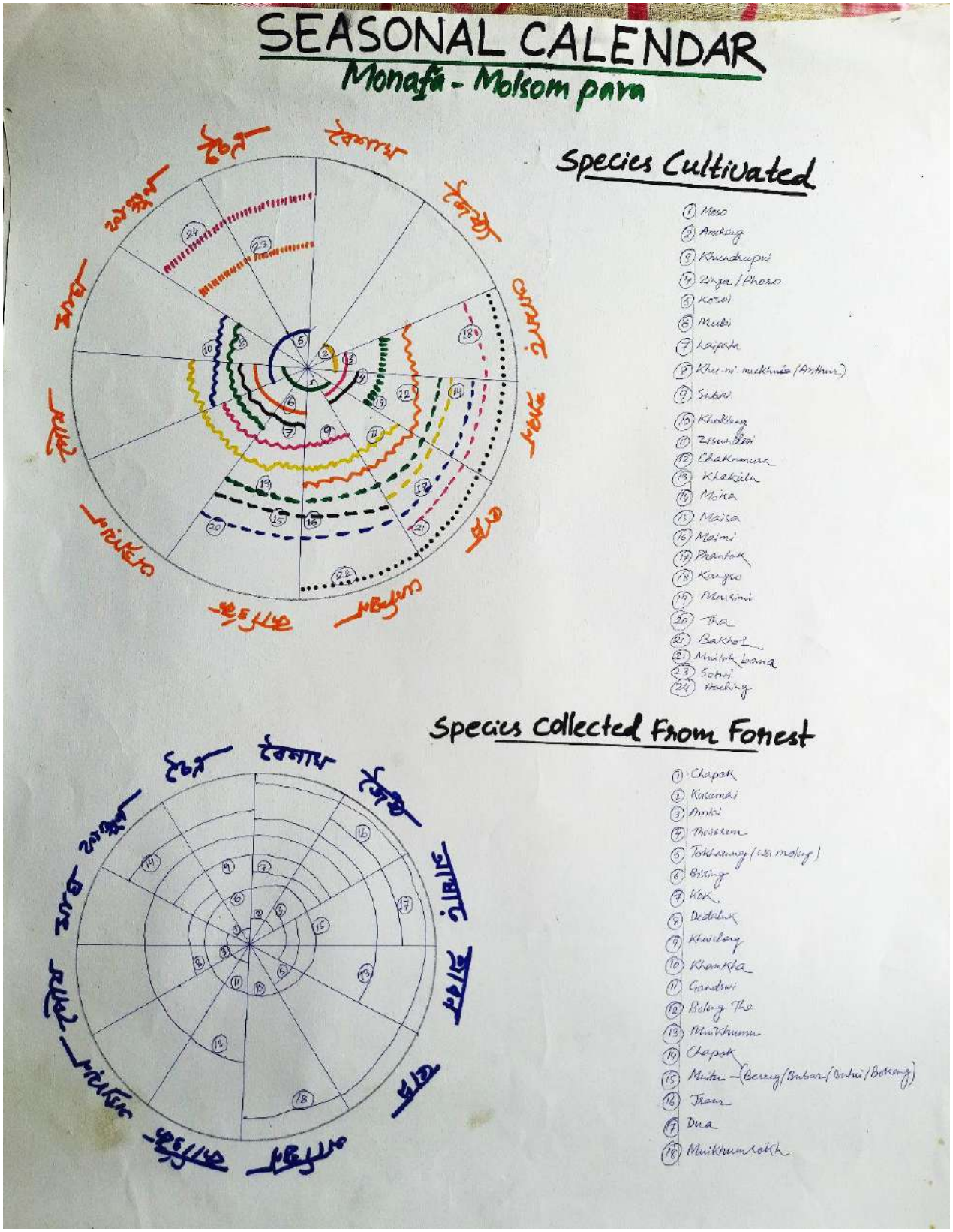
3A. Seasonal Calendar- Chaplingchara



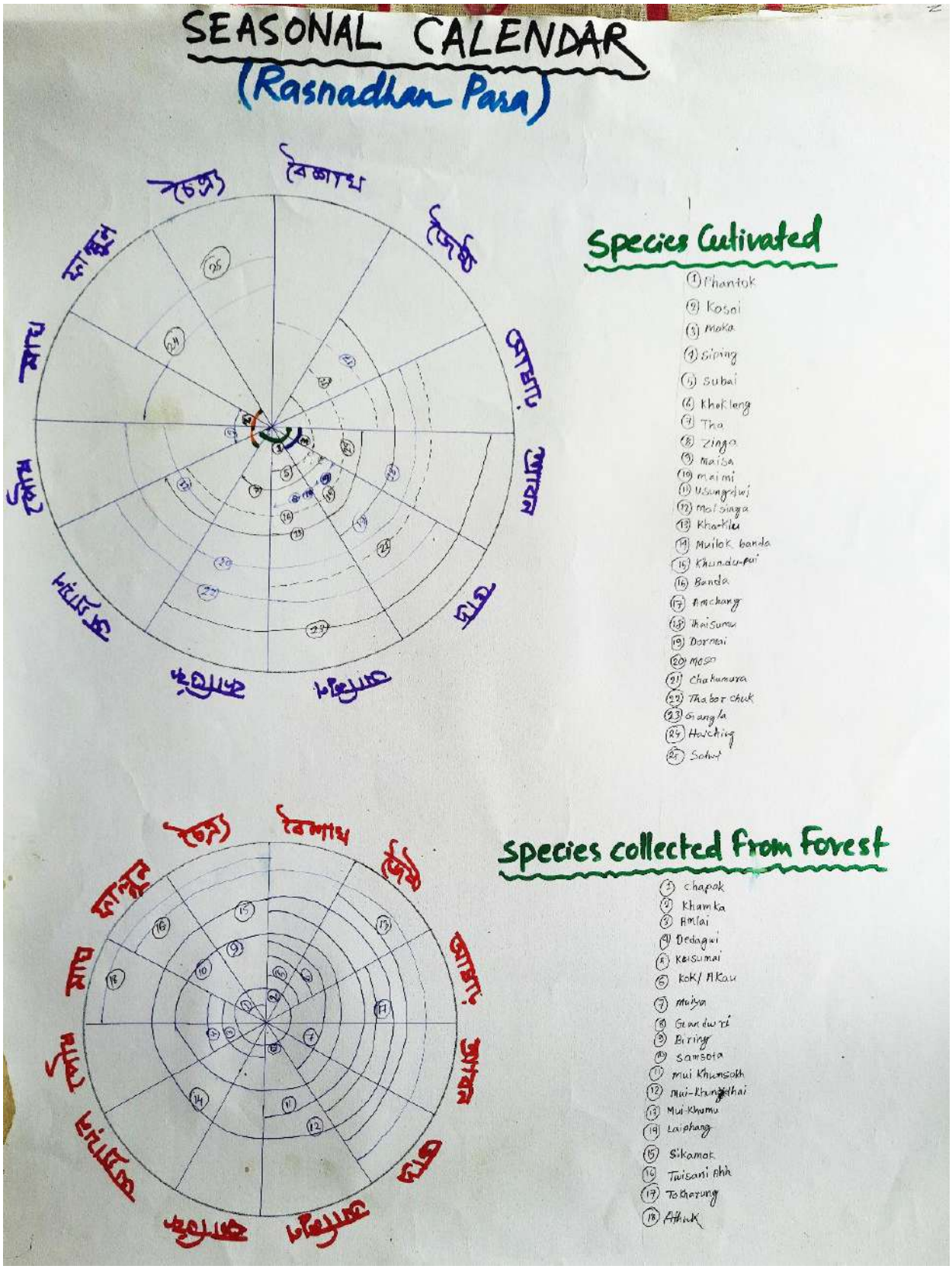
3B. Seasonal Calendar - Charanda Roaja para



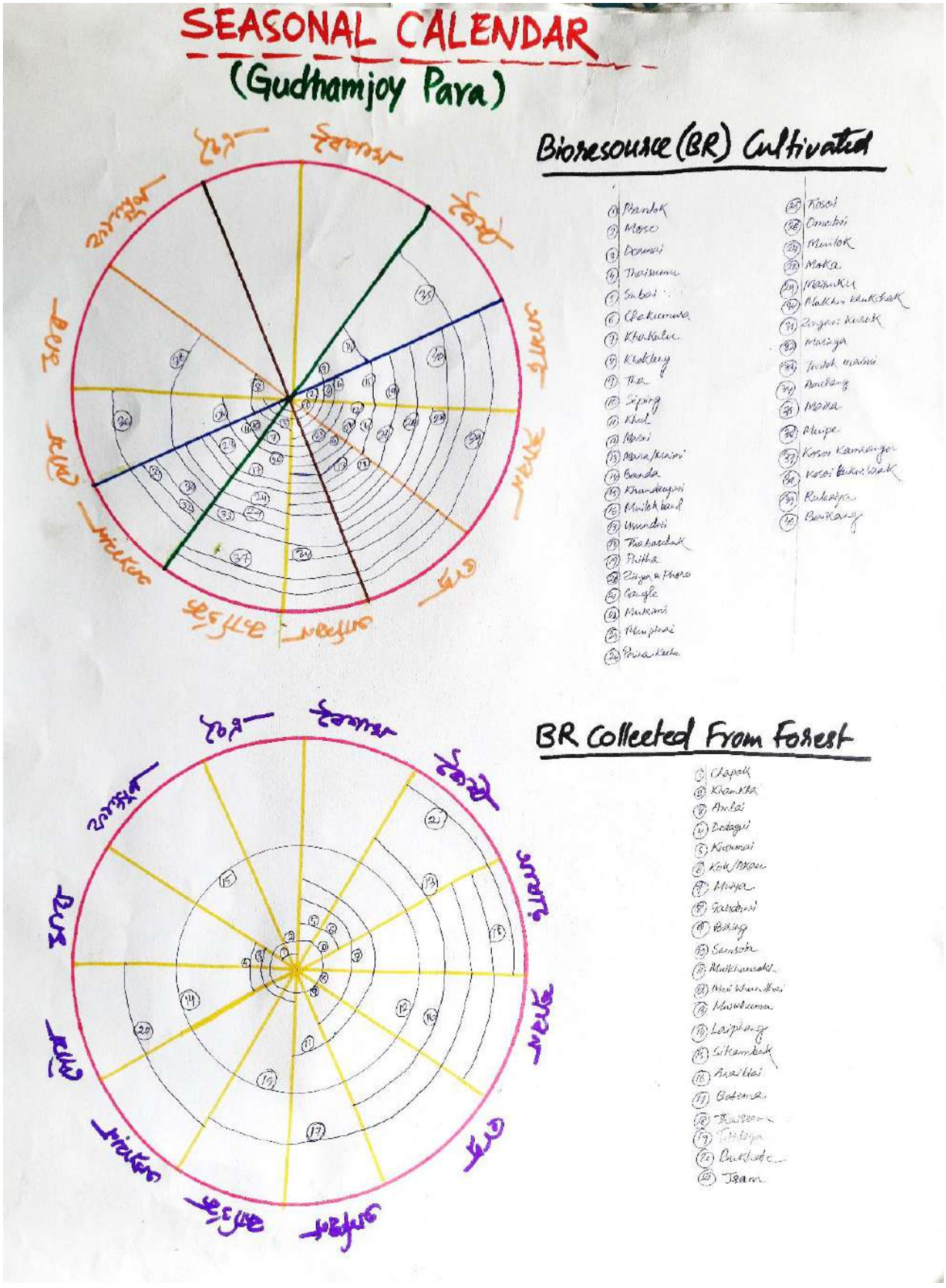
3C. Seasonal Calendar - Monafa



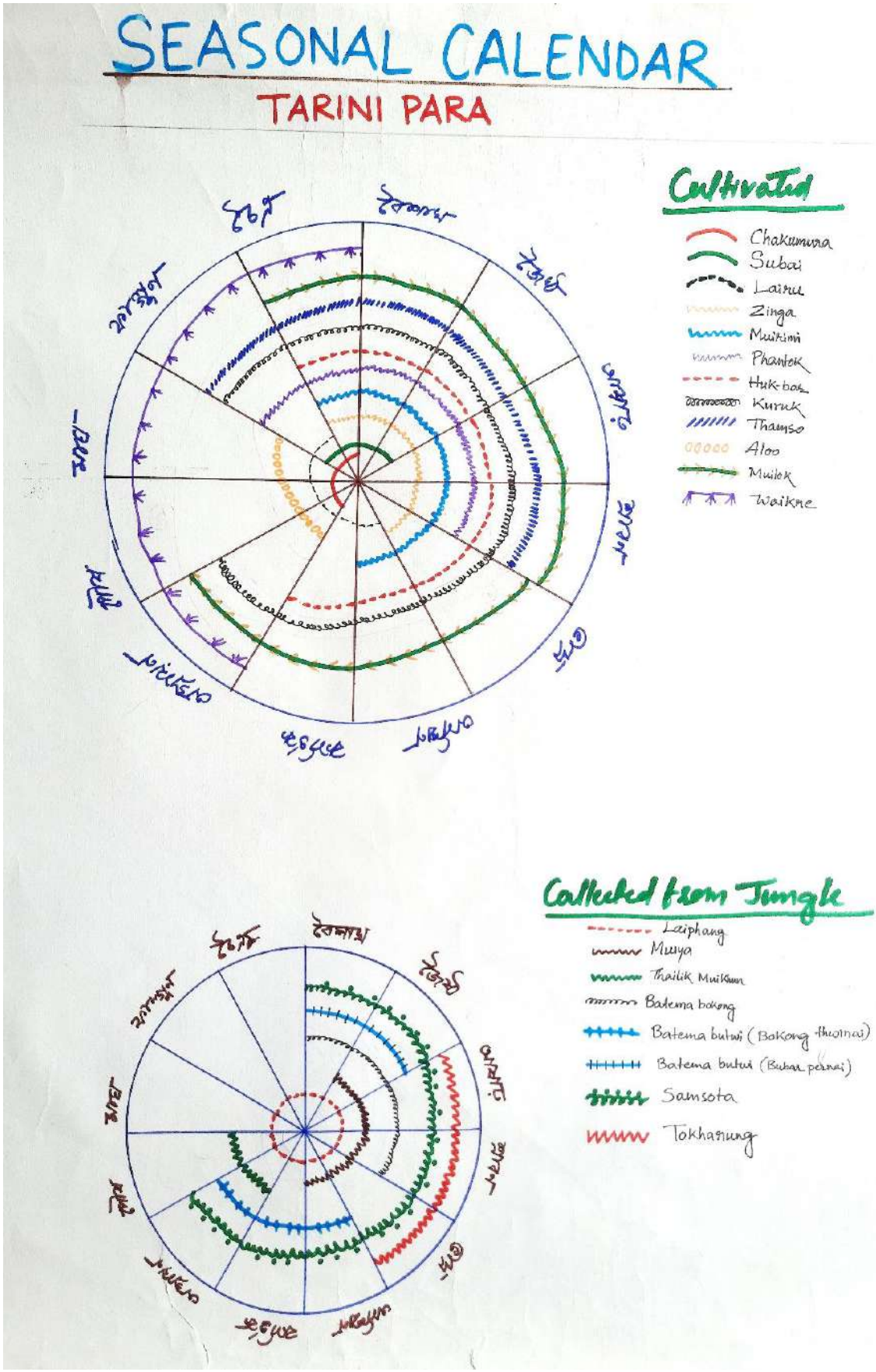
3D. Seasonal Calendar - Rasnadhan Para



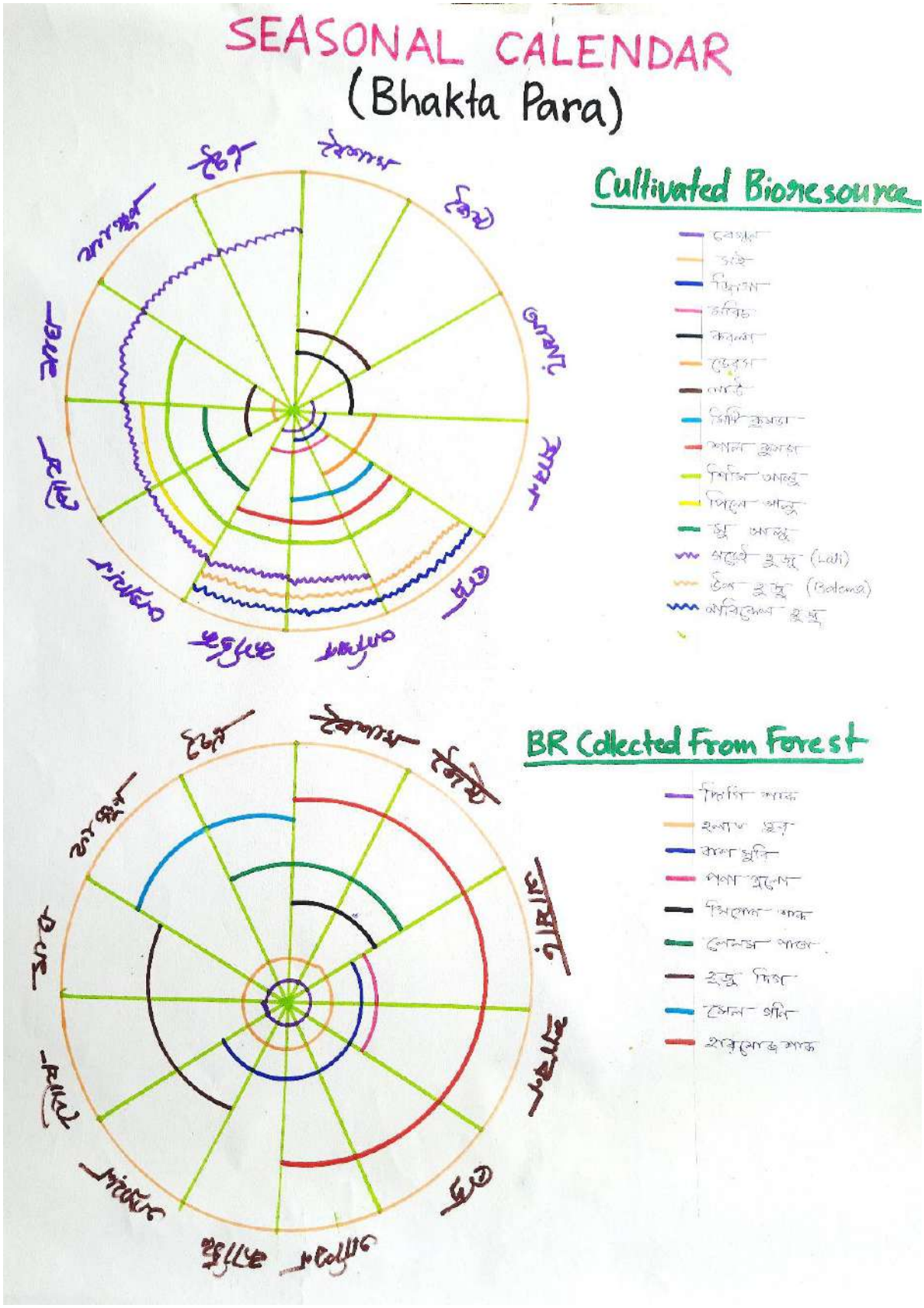
3E. Seasonal Calendar - Gudhamjoy Para



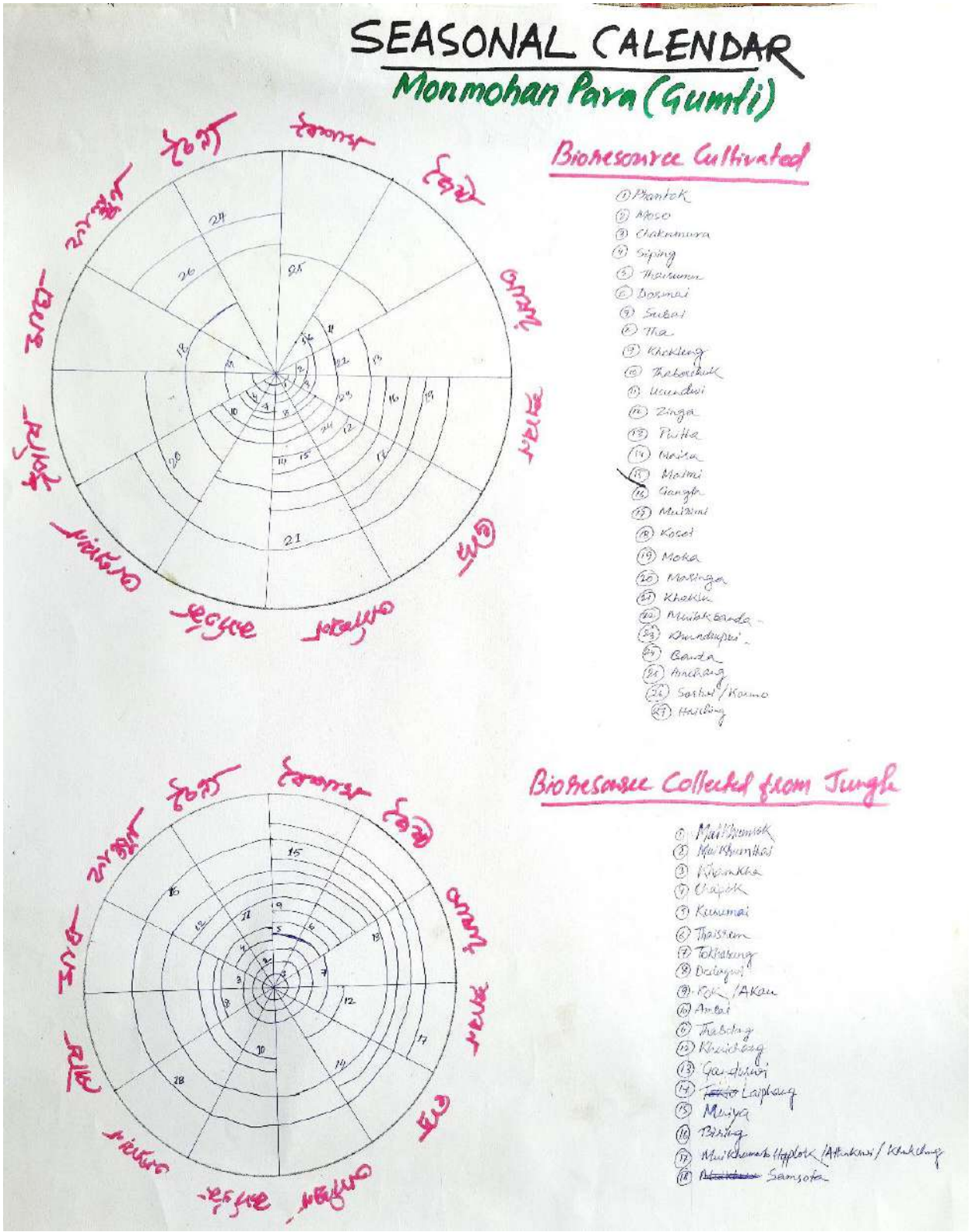
3F. Seasonal Calendar - Tarini Para



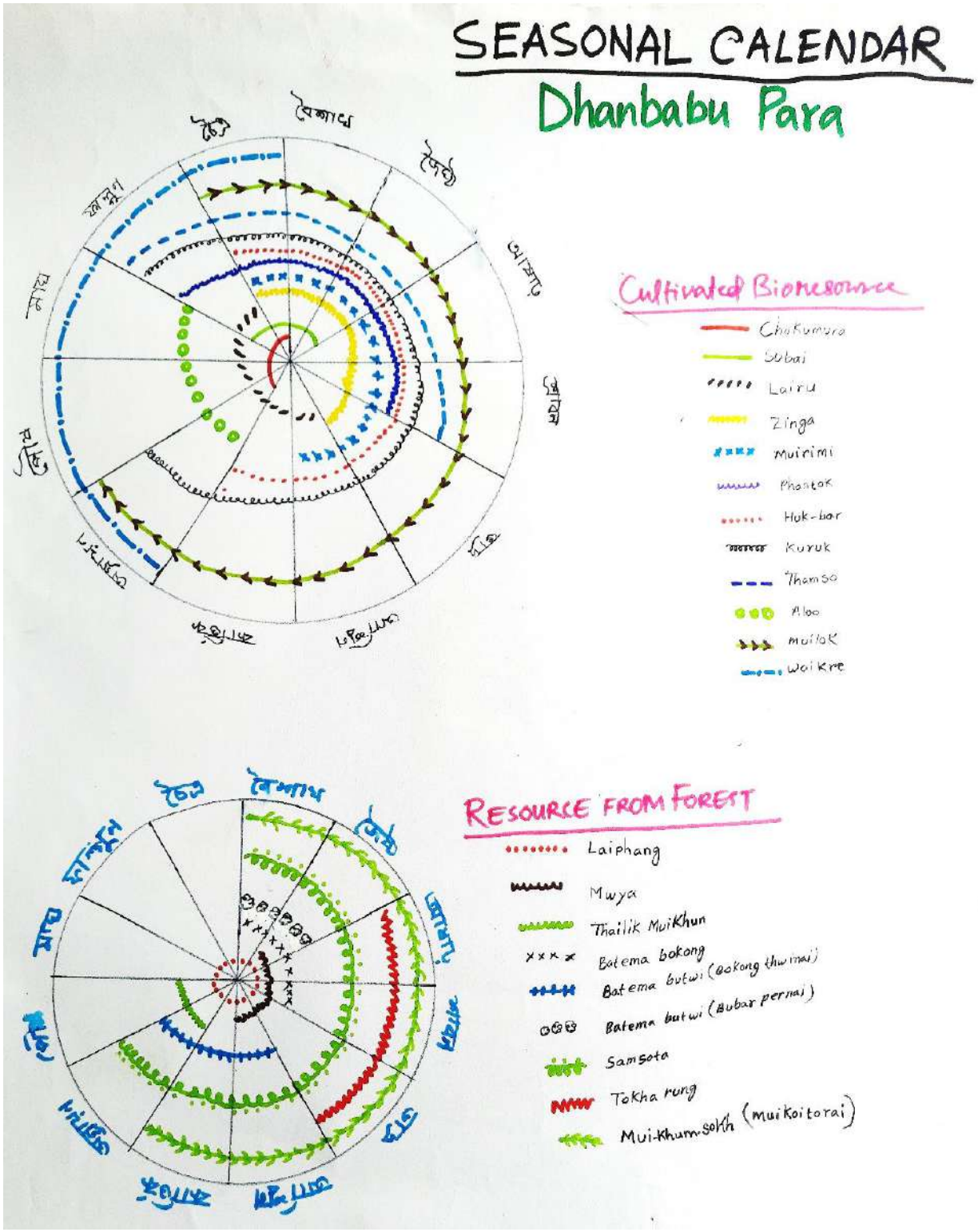
3G. Seasonal Calendar - Bhakta Para



3H. Seasonal Calendar - Monmohan Para



3I. Seasonal Calendar - Dhanbabu Para



ANNEXURE-11

LIST OF FIGURES

Fig. 1: Study area (Dumbur basin) and Protected area

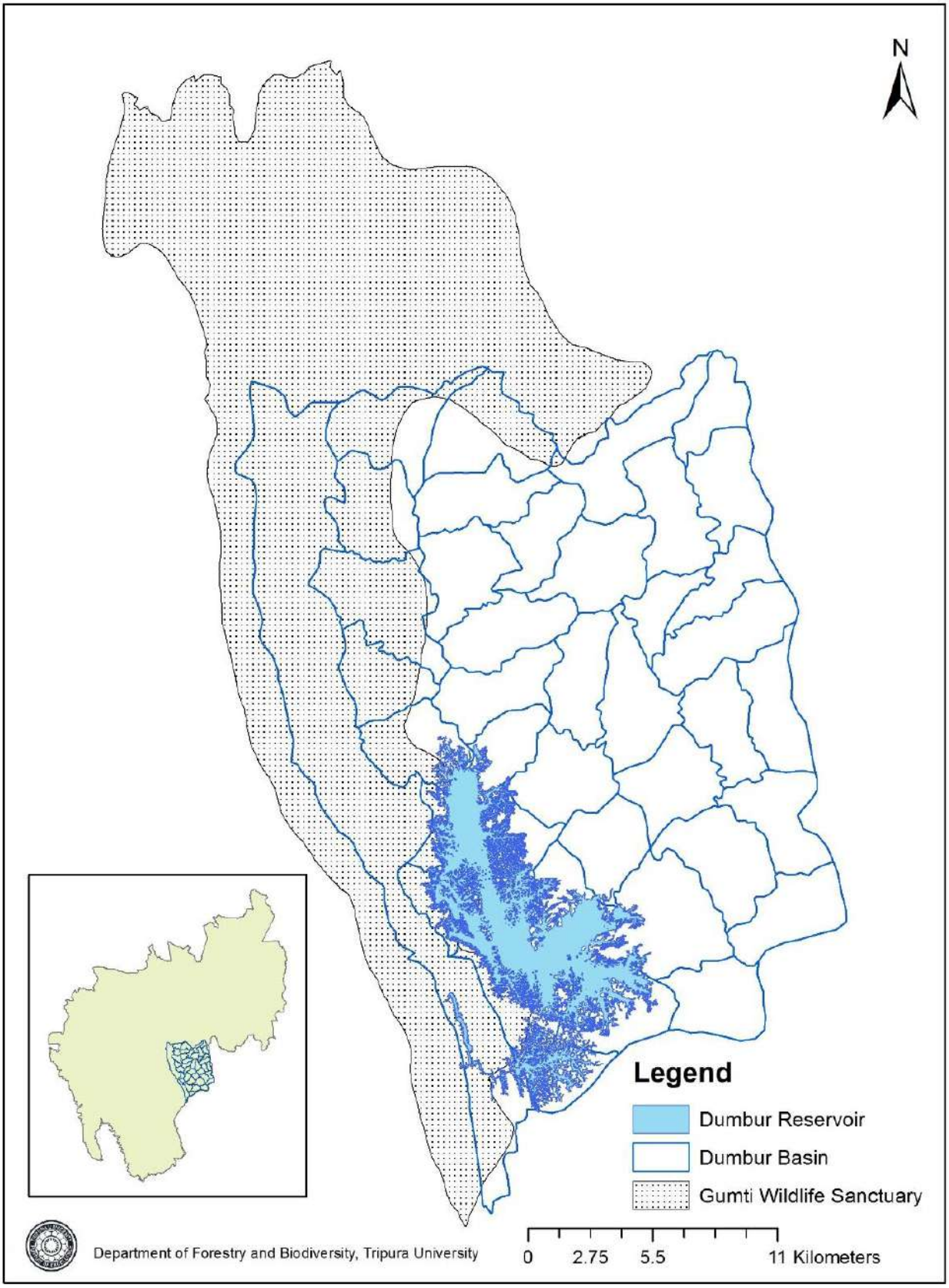


Fig. 2: Topography of Study area (Dumbur basin)

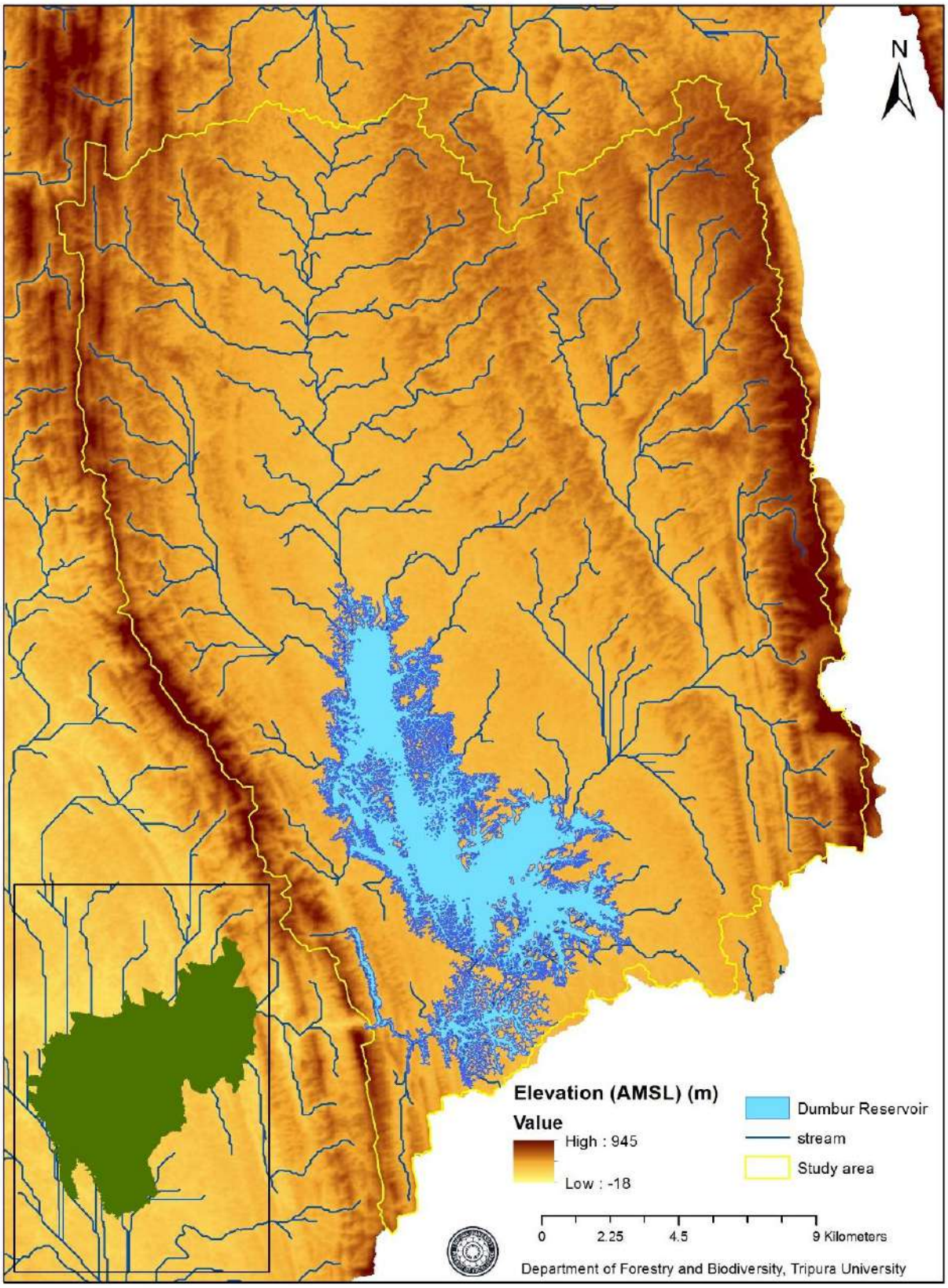


Fig. 3: Land use Land Cover of Gumti Basin Tripura

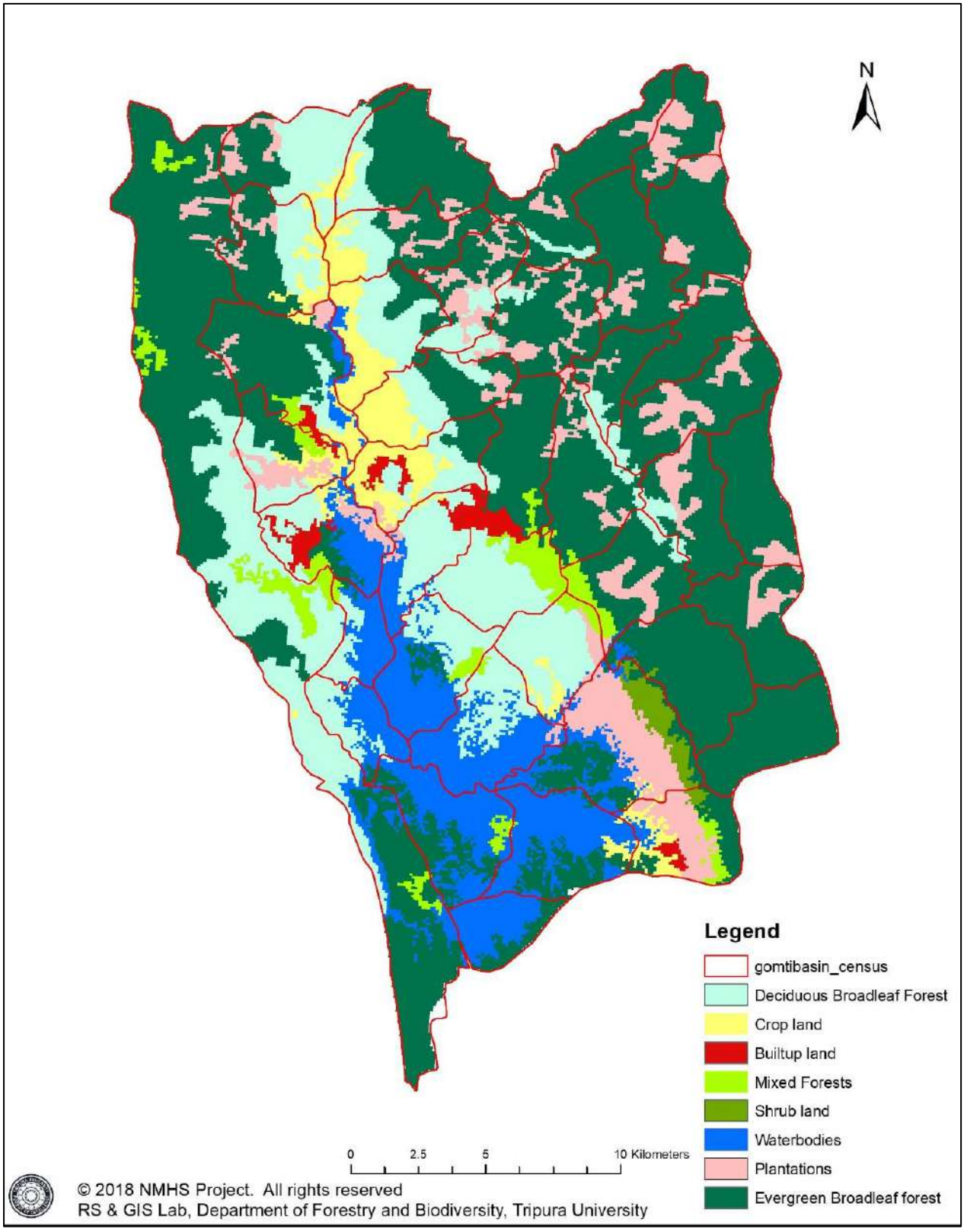


Fig. 4: Tree Cover of Gumti Basin, Tripura

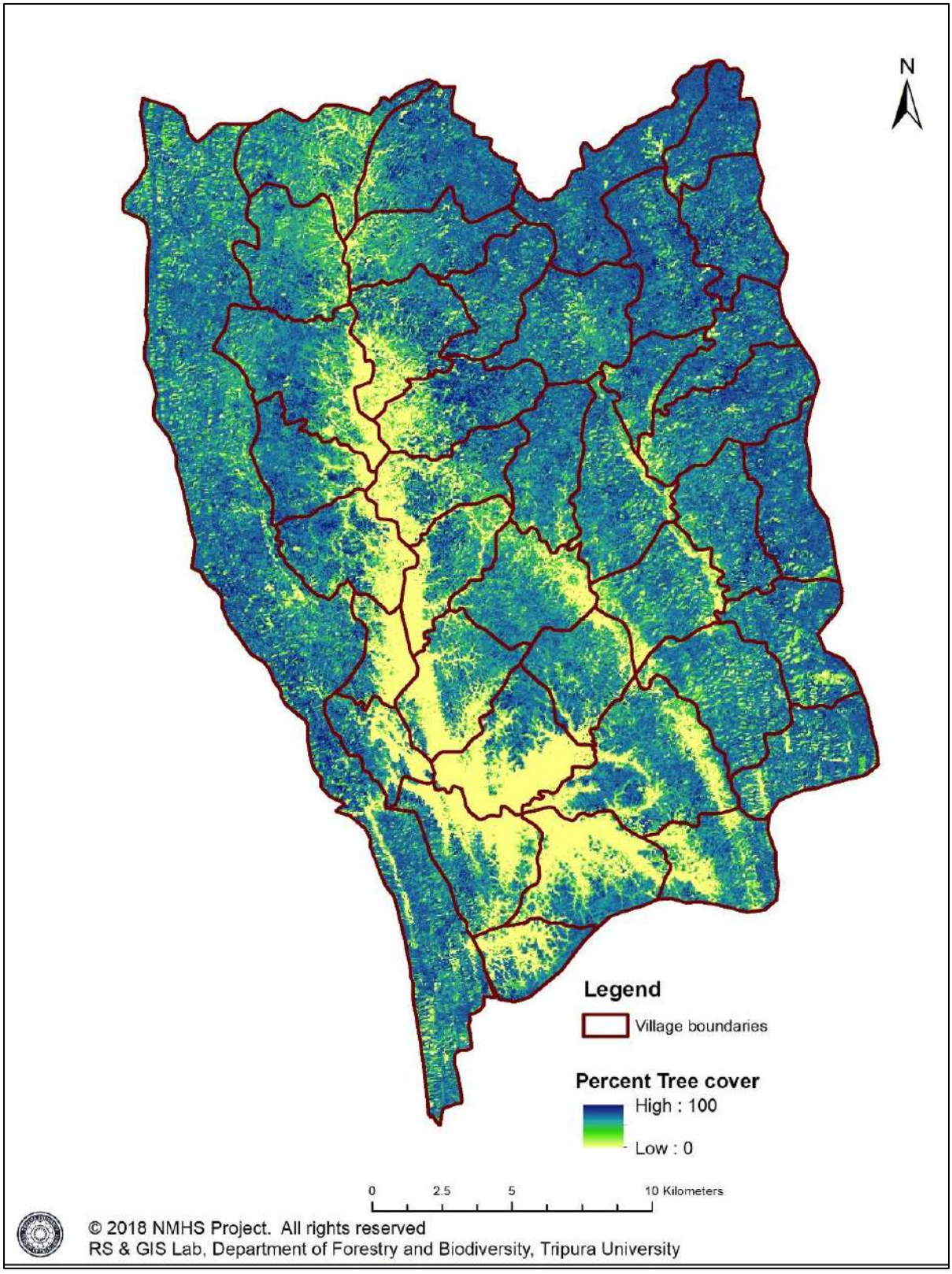


Fig. 5: Villages around Study area (Dumbur basin)

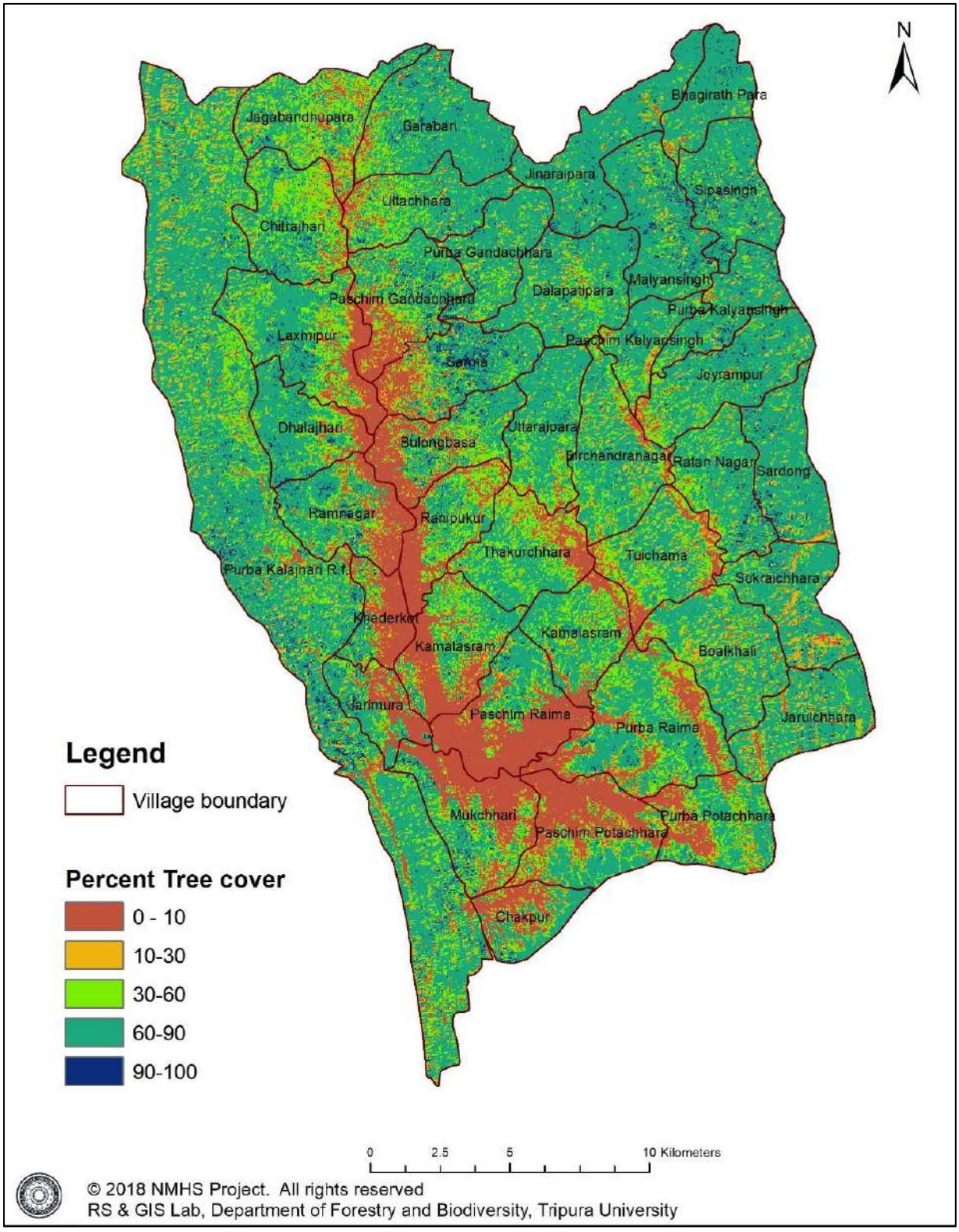


Fig. 6: Population of villages around Dumbur basin as per 2001 Census

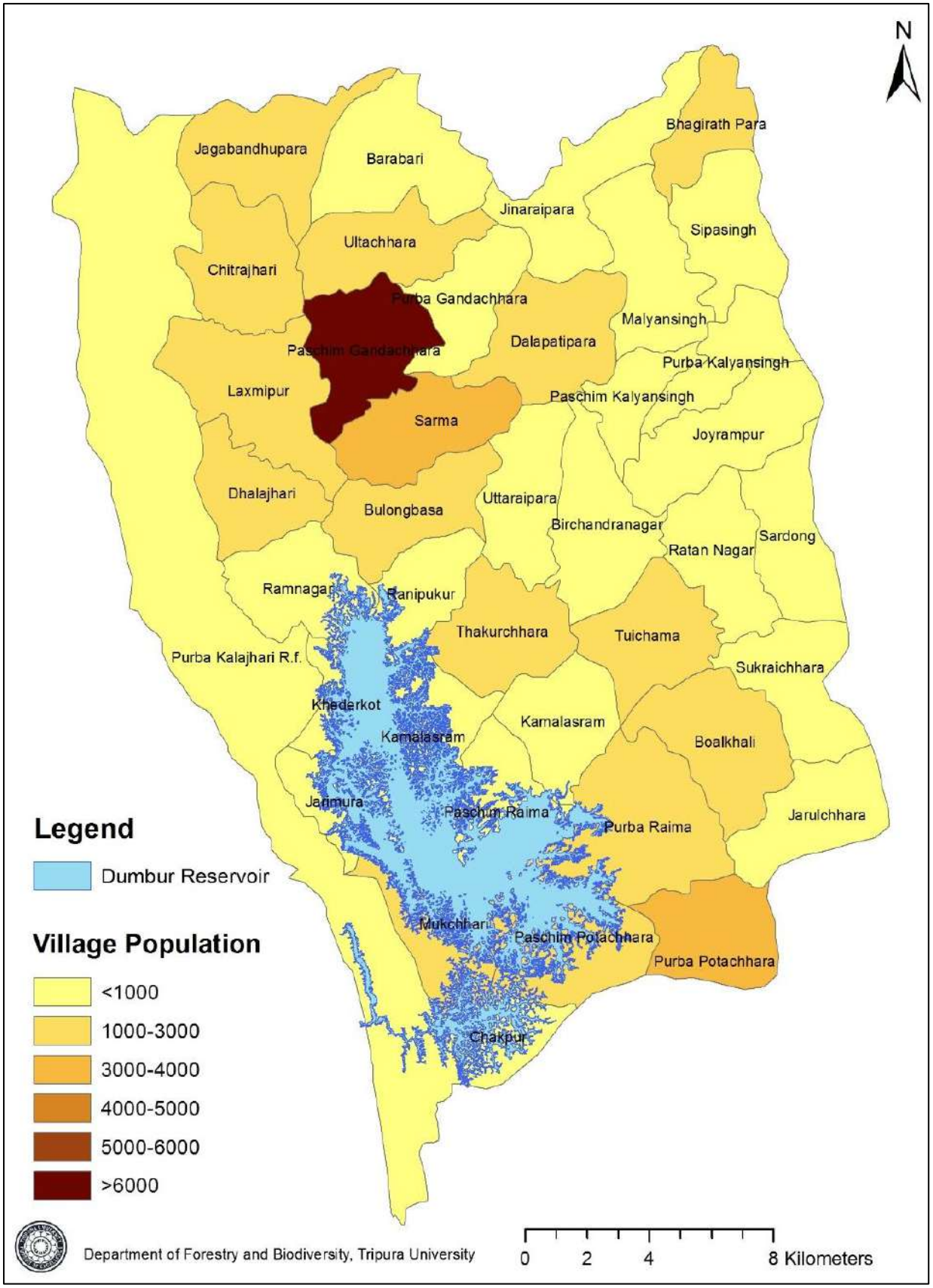


Fig 7: Quadrat based survey conducted for plant diversity assessment (A-C)

(A) 1m X 1m Quadrat laid for herbaceous species

(B) Measurement of Breast height at 1.37m

(C) measurement of GBH during the Quadrat sampling

Fig 8: Some species spotted during Transect based survey (A-D)

(A) Common tiger (*Danaus genutia*) spotted during the survey

(B) Asian Openbill Stork (*Anastomus oscitans*) spotted during the survey

(C) Little cormorant (*Microcarbo niger*) spotted during the survey

(D) Chestnut-tailed Starling (*Sturnia malabarica*) spotted during the survey

Fig. 9 Observations during Wildlife Census of Gumti Wildlife Sanctuary (A-B)

(A) Pugmark of a Leopard cat

(B) Scratch mark of Himalayan Black Bear

Fig 10: Bioresource Market Survey (A-D)

(A) Traditional Handicraft worker selling his LANGA at Gandachara Market

(B) Market survey at Jagabandu Bazar

(C) Market Survey at Ramnagar Bazar

(D) Market survey at Narayanpur Bazar

Fig 11: Questionnaire Survey at village households for Bioresource information (A-B)

(A) Questionnaire survey at Ranjit Roaja Para

(B) Questionnaire survey at Charanda Roaja Para

Fig.12 Awareness programme conducted by JPFs

Fig. 13 Sensitization Program- Popular talk and Screening of Documentary at Schools (A-D)

(A) JPF Explaining the Documentary at Gandachara Class XII School

(B) PI giving some practical talk at Raishyabari Class XII School

(C) Sensitization at Gandachara Class XII School

(D) Sensitization at Raishyabari Class XII School

Fig. 14 Sensitization Program - Popular talk and Screening of Documentary at villages (E-H)

(E) Sensitization at Tarini Reang para

(F) Sensitization at Jibakarta para (Monafa)

(G) Sensitization at Leypada para

(H) Sensitization at Ranjit Roaja para

Fig 15: Leaflet written in English for distribution

Fig 16: Leaflet Translated in Kokborok for distribution.

Langma gwnang nangma manwino Khati narukmung

Gumoti twi-yaphangno rwksawi panjalwi naharmung

Kokyaphang

Bororokni bagwi samung nangmani abo hai langma gwnang manwi-malmata, buphang-waphangroknono Langma gwnang samungni manwi hwnjago. O Langma gwnang samungni manwini baithang samung nangmarok hwnkhe- Buthai, Muikwthung, Buduk, Bokong, Thok, Rong aborokni bisingtwi. Wngyakhe ba Baithangyakhe samung nangmarok wngkha- Ha kwkhlaima kati rwnani, Khumbarrok bar rwthani, Naithok-Nukthokkhe tonthani, tai o swngcharni satung-watwi-nokbarrokno thitikhe tonthani. Kwbangkuk borokrokni nangmani manwirok omoroknino phaio tai aboni bagwino chwng o manwirokno thigwi samungo thepanani nangnai, twmani hwnkhe chini sai ulo phainai bororokbo thinango a manwirokno samungo thepana sep mannani nangnai. O hani borok wngwi chwng o manwirokno khatiwi tonnani tai soikhe naikolnanino chini kaisa khlaithai kotor. Hakhe omohai khlaimani bisingtwi chwng bolong bai krwngwi tongnairokni bagwi kaisa thangwi tongwi ajinani lamabo wngo.

DAL BIDAL LANGMA GWNANG SAMUNGNI MANWIROK

Gumti Harwkwngo kwbangmano dalbidal Manwi khunuirok manthogo· Omorok wmgkha:

Langma gwnang nangma manwi	Dal bidal (Wngthothok)
Bithi-bwrai tai Motom nai	150
Rong bai tannin	45
Bwstung tai khutungrok	20
Nil/Lasa, Satrai tai oleo-satrai	15
Bolongni muikuthung	40
Muikhumu	10
Thok snamjaknai	15
Wa bai Rai	15
A tai athukrok	80

O nangkukmani manwirokno kholwi tubuwi Nogo songwi chajago ebakheba Gana-ginini Hatirogo (Gandacherra, Raishyabari, Jagabandu, Ramnagar, Hatimatha Hati etc·) tiwlangwi phaljago· Baksakheba hakchalo eba kubun harogo tiwangwi phaljago· Baksa Manwirokno lukurokno khogwi-huywi eba gana-ginini bororok siyatwikhe phaljagwi tongo hwnwibo sai mankha·

Nangma manwirokni kisicha Sampli

Gandaki (Ben) Gandrwi (Kok)
Homalomena aromatica

Ganga Alu (Ben) Tha Bolong (Kok)
Dioscorea hamiltonii

Latka (Ben) Kusumai (Kok)
Bauccauria ramiflora

Kau (Ben) Kok/Akau (Kok)
Garcinia cowa

Sonapati (Ben) Tokha-rung (Kok)
Oroxylum indicum

Kantakachu (Ben) Gantha (Kok)
Lasia spinosa

Translated by: Mr Kiran Kr. Murasing, JPF, NMHS Projectf rom English

Finally checked and verified by: Dr. Samir Debbarma & Dr. Biman Debbarma, Department of Kokborok, Tripura University

LANGMA GWNANG MANWIROKNO KHATIWI NARUKNA BAGWI RINGMUNG

Omohai nukjakkha je kwbangma Buphang tai malmatarokno bororok nangmani barakhe samungo thepalaikha tai aborokno sokomorjaknani sampa rwlaikha· Aboni bagwi je manwirokno borokrok salbrum samungo thepalai abohrok kwbangmano gana-ginini amchaini kwmawi tongo· Omohaikhe soikhe samungo thepayarokni bagwi kwrakkhe yapri maselainai· Aboni bagwi chwng joto thansakhe phaiwi a nangma manwirokno soikhe khatinani, naikini khlainani tai soikhe rawi-thumnani dowi soi samungno tuwi yapri maselainai· Chwng jotono bolongni a Buphang-waphangrokno khatiwi tonna hwnkhe chini nok ganarogo, Barirogo tai panthorrogobo makailainai· Jora wngwi tongkha Tinino chapdi Thinangni hamkraini bagwi·

Khelengbar (Kok)
Renanthera imschootiana

Agar (Ben) Agorphang (Kok)
Aquilaria malaccensis

Sumal (Kok)
Wallichia caryotoides

Koi (Ben) Kui (Kok)
Anabas testudineus

Wathwi Muya (Kok)
Melocanna baccifera

Tengra (Ben)
Mystus vittatus

Deuwa (Ben) Duwa (Kok)
Artocarpus lacucha

Thaibai/Pilekulu (Kok)
Hodgsonia macrocarpa

Kukurchita (Ben)
Litsea glutinosa

LANGMA GWNANG SAMUNGNI MANWIROKNO TONG KESEP KHLAI NAI ROK

- **Hayungni Hamkrai**
- **Nangma barakhe thumui khibimarok**
- **Raida chayatwi thummani tai mal-matarokno khogwi-huyui phalmani**
- **Bolong sokomorma**
- **Nangma bara adar charwmung**
- **Phatarni hamung siniya prajatirok**
- **Sirisitini hukumu tai simung kwmamani**
- **Tongkhor deramung**

CHWNG TAMO KHAI MAN?

- **Langma gwnang manwirokni chukmungno khatiwi naruk tonthani chwng sakbaithangno gwdai ruwi tonkhe thinango aborok chwngno thangwi tongthani chubanai.**
- **Langma gwnang manwirok hamya wngmani pherno sinani nangnai.**
- **Chini chubachu haphangni raida swnam thani tai khwlaimungni bisingtwi o Ecosystemno khatiwi naruk mannai.**

O bwlai phumukthani Rang-puisa o chubanai wngkha National Mission on Himalayan Studies (NMHS), GBPNIHESD, Almora, U.K., INDIA

Teibo kwbang saimanna bagwi kwrwngdi:
Dr Thiru Selvan eba Dr Sabyasachi Dasgupta no, Department of Forestry and Biodiversity

log on to: conservationtourism.in
E-Mail: tconservationtourism@gmail.com

Fig 17: Leaflet Translated in Bengali

Fig 18: Pamphlet prepared in English (A-B)

(A)

Conservation Tourism

with special focus on Gumti Basin, Tripura

ECO-TOURISM AND SOCIO-ECONOMIC-ECOLOGICAL SUSTAINABILITY

COMMUNITY BASED ECO-TOURISM

- Involving residents into ecotourism, can help local people meet their economic needs, by maintaining and enhancing the "sense of place" for long-term conservation.
- Uplift the standard of local people by involving them as guide for Bird watching, Ecosystem monitoring and narration etc.

SUSTAINABLE TOURISM

Tourism that will not reduce the availability of resources and does not inhibit future travelers from enjoying the same experience.

LOW VOLUME, HIGH VALUE AND LOW IMPACT TOURISM

Socio-Economic-Ecological Sustainability

ECO-TOURISM FOR CONSERVATION

- *Helps in protections of ecologically sensitive locations.*
- *Generates income and livelihood options for the local people.*
- *Creates awareness to conserve and protect environment.*
- *Helps to get closer to the nature's beauty.*
- *Awareness to protect endangered species.*

ECO-TOURISM AND CULTURE

- *Ecotourism adds value to cultural traditions and practices.*
- *Eco-tourism offers incentives to keep tradition alive and to preserve the heritage of culture, village for ecotourists who are willing to pay to learn and appreciate such things.*
- *Ecotourism promotes belief systems and tries to acknowledge conservation initiatives.*

This publication is produced with the financial support of National Mission on Himalayan Studies (NMHS), GBPNIHESD, Almora, U.K., INDIA

For more details contact:
Dr Thiru Selvan or Dr Sabyasachi Dasgupta,
Department of Forestry and Biodiversity

log on to: conservationtourism.in
E-Mail: tconservationtourism@gmail.com

(B)

Fig 19: Pamphlet Translated in Kokborok (C-D)

(C)

Tourism ni bisingtwi Soi khatimung

Panjalwi naharmwng- Gumoti twi-yaphang no rekewi

ECO-TOURISM TAI SOCIO-ECONOMIC-ECOLOGICAL SUSTAINABILITY

DOPHAROKNI BISINGTWI ECO-TOURISM

- Noknukhungno Ecotourism bai kwrungrowi rangkhok puicha ajithani chugwi mano tai kuduk khatimungni bagwi Noknukhungno soi khe naikini khlaima bai twitherna nangnai.
- Toksatoktwi naimung, Ecosystemno soi khe twithermung tai kothoma sawi khnarwmani rogo kwrwng rwmani bisingtwi ganao tongnai bororokni noknukhungno saka kasarwmano.

TONGKUSUNGNI TOURISM

Omohai Tourism o nangma manwi tongmarok komorwi thanglak taibo se thinango naina bagwi phainai bororokbo a manwirokno nugwi mannai.

CHIKON PHIYA NANGKUKMANI TAI KEBENGTHAYA ABOHAI TOURISM

Socio-Economic-Ecological Sustainability

KHATIMUNG NI BAGWI ECO-TOURISM

- *Ecologically sensitive jagathai rokno katirwthani chugo.*
- *Ganani bororokni bagwi ajinani tei thangwi tongnani lama snamwi rwo.*
- *Environment no hamya wngnani katithani tei khatiwi tonnani sicharwo.*
- *Hayungni naithok nukthok bai kwrwng rwo.*
- *Komortwtwi projatirokno khatinani phrwngwi sicharwo.*

ECO-TOURISM BAI HUKUMU

- *Agini hukumu tai khlaimung rokno tor-rwthani tai rak rwthani Ecotourism chugo.*
- *Eco-tourism ni bisingtwi agini khlaimungrokno kwthang tonthani tai yaphangni hukumu rokno kwmayatwi khe tonthani chubachu mano.*
- *Dopharokni poito khlaimungrokno pirthani tai bohrok khatimungni bagwi saktharmani kokno Ecotourism pirwi buino bo khnarwo.*

Kok slainai: Mr Kiran Kr. Murasing, JPF, NMHS Project

Paithago check tai verify khlai kha:
Dr. Samir Debbarma & Dr. Biman Debbarma, Department of Kokborok, Tripura University

O bwlai phunukthani Rang-puisa o chubanai wngkha National Mission on Himalayan Studies (NMHS), GBPNIHESD, Almora, U.K., INDIA

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Dr Thiru Selvan eba Dr Sabyasachi Dasgupta no, Department of Forestry and Biodiversity

log in khlaidi: conservationtourism.in
E-Mail: tconservationtourism@gmail.com

(D)

Fig 20: Pamphlet Translated in Bengali (E-F)

(E)


Conservation Tourism
সংরক্ষণ জনিত পর্যটন
বিশেষ দৃষ্টিআরুপ ত্রিপুরার গোমতী অববাহিকার উপর
পরিবেশ-পর্যটন এবং আর্থ-সামাজিক-বাস্তুতান্ত্রিক স্থিতিশীলতা
সম্প্রদায় ভিত্তিক পরিবেশ-পর্যটন
• অধিবাসীদের পরিবেশ-পর্যটনের সঙ্গে যুক্ত করে দীর্ঘমেয়াদী সংরক্ষণের জন্য জায়গাটির নিজস্বতা ও উন্নতির কারণসরূপ স্থানীয় লোকদের অর্থনৈতিক চাহিদা মেটানোর জন্য সহায়তা করতে হবে।
• পাখি পর্যবেক্ষণ, বাস্তুতন্ত্রের তদারকি ও বিবরণ ইত্যাদির জন্য পথ প্রদশক হিসাবে স্থানীয় মানুষকে জড়িত করে তাদের মান উন্নীতে সহায়ক হতে হবে।
স্থিতিশীল পর্যটন
পর্যটন যা সম্পদের প্রাপ্যতা হ্রাস করবে না এবং ভবিষ্যত ভ্রমণকারীদের একই অভিজ্ঞতা উপভোগ করতে বাধা দেবে না।
স্বল্প পরিমাণ, উচ্চ মানসম্পন এবং পর্যটনের উপর কম প্রভাবশীল।
SUSTAINABLE DEVELOPMENT GOALS
আর্থ-সামাজিক-বাস্তুতান্ত্রিক স্থিতিশীলতা
সংরক্ষণের জন্য পরিবেশ-পর্যটন।
• পরিবেশগত দিক থেকে সংবেদনশীল অবস্থানগুলির সুরক্ষায় সহায়তা করে।
• স্থানীয় জনগণের জন্য আয় ও জীবিকার বিকল্প তৈরি করে।
• পরিবেশ সংরক্ষণ ও সুরক্ষায় সচেতনতা সৃষ্টি করে।
• প্রকৃতির সৌন্দর্যের আরও কাছে নিয়ে যেতে সহায়তা করে।
• বিপন্ন প্রজাতির সুরক্ষার জন্য সচেতন করে।
পরিবেশ-পর্যটন এবং সংস্কৃতি
• পরিবেশ-পর্যটন সাংস্কৃতিক ঐতিহ্য এবং অনুশীলনের মান বাড়াতে সহায়তা করে।
• পরিবেশ-পর্যটন সংস্কৃতির ঐতিহ্যকে বাঁচিয়ে রাখতে এবং সংরক্ষণের জন্য উৎসাহ দেয়, এবং গ্রামের এই জিনিসগুলি সম্পর্কে জানতে এবং তারিফ করতে অনেক পর্যটকরা অর্থ দিতে আগ্রহী হন।
• পরিবেশ-পর্যটন বিশ্বাস ব্যবস্থা প্রচার করে এবং সংরক্ষণের উদ্যোগগুলি স্বীকার করার চেষ্টা করে।
অনুবাদক : প্রসেনজিৎ পাটারী এবং কিরণ কুমার মুড়াসিং
অরণ্যবিদ্যা ও জীববৈচিত্র্য বিভাগ, ত্রিপুরা বিশ্ববিদ্যালয়
এই প্রকাশনার আর্থিক সহায়তায় সাহায্য করেছে ন্যাশনাল মিশন অফ হিমালয়ান স্টাডিজ (এনএমএইচএস), জিবিপিএনআইএইচএসডি, আলমোড়া, উত্তরাখন্ড, ভারত
অরণ্যবিদ্যা ও জীববৈচিত্র্য বিভাগ, ত্রিপুরা বিশ্ববিদ্যালয়, আগরতলা, ভারত
বিস্তারিত জানার জন্য যোগাযোগ করুন:
ডঃ থীরু সেলবন বা ডঃ সব্যসাচী দাশগুপ্ত,
অরণ্যবিদ্যা ও জীববৈচিত্র্য বিভাগ,
লগইন করুন: conservationtourism.in
ই-মেইল: tcconservationtourism@gmail.com

(F)

Fig. 21. Training of Forest Officials of Gumti Wildlife Sanctuary by PI and Co-PI (A-B)

(A) Project Official (PI & CO-PI) and Warden of Gumti wildlife sanctuary explaining the methods of Wildlife Census to the Forest officials

(B) Undersigned staff for Wildlife census at Gumti Wildlife Sanctuary

Fig 22: One Day training on Community based Forest management and Ecotourism as livelihood option (A-F)

(A) Facilitation of the Guests during the Training programme.

(B) PI of the Project delivering a message through a documentary video.

(C) Young female participants of the training

(D) Male participants of the training

(E) Elderly women participants joining training from the cottage

(F) PRA Exercise conducted during the training programme

Fig 23: Formation of Ecotourism management committee at Tarini Reang para

Fig. 24 PRA exercise conducted at different locations (A-I)

(A) PRA Exercise at Bhakta Para

(B) PRA Exercise at Gudhamjoy Para

(C) PRA Exercise at Chaplingchara

(D) PRA Exercise at Charanda roaja para

(E) PRA Exercise at Dhanbabu Para

(F) PRA Exercise at Manubakta para

(G) PRA Exercise at Manmohan para (Gumti)

(H) PRA Exercise at Rashnadhan para

(I) PRA Exercise at Tarini Reang para

Fig 25: A Paper published on 11th Convention Planner 2018 by Tripura University on 15-17 November, 2018

Prospects of Forest Based Ecotourism for Conservation of Biodiversity in Tripura

Dr. Thiru Selvan
Dept. of Forestry and Biodiversity,
Tripura University

Forest resources in Tripura are rich in its bioresources and possesses enormous diversity. In Tripura two third (> 60%) of the geographical area are covered by forests. The majority of the forests belong to East Himalayan Moist Mixed deciduous (39 %) & Low Alluvial Savannah Woodland (43%) with some area under Cachar Tropical Semi-evergreen (3%); Secondary Moist Bamboo Brakes (8.5%) & East Himalayan Lower Bhabar Sal (4%). The forests have high degree of endemism and genetic diversity by possessing rich species diversity. Tripura's forests are rich in its plant and animal life with 379 tree species, 320 shrubs, 581 herbs, 165 climbers, 16 climbing shrubs, 35 ferns, and 45 epiphytes registered so far (Kshirsagar and Upadhaya, 2009; Sharma et al., 2013) and 1708 species of animals belonging to 1042 genera with 536 species of Insects in 346 genera; 259 species birds in 157 genera and 474 vertebrate fauna species under 301 genera (ZSI, 2002).

The state of Tripura is inhabited by 19 tribes, namely Jamatia, Chakma, Halam, Kuki, Chaimal, Uchoi, Magh, Garo, Lushai, Bhutia, Lepcha, Bhil, Munda, Oraon, Mog, Santhal, Murasing, Reang and Tripuri. Most of these tribal communities live in and around dense forests, and have maintained their own culture, language, food habits, and socio religious traditions (Deb et al., 2013, Sharma et al. 2013). Most of the tribal economies are engaged in subsistence agriculture and have developed great knowledge on the use of plants and plant production in curing various ailments (Debbarma et al, 2017). The population has a deep belief in their native folklore medicine for remedies. Among the communities in Tripura each community has their unique socio-cultural heritage, language, food habits (Majumdar and Datta, 2007).

Tripura has five parallel hill ranges which viz. Baramura-Deotamura, Atharamura, Jampui, Langtarai and the Sakhantlang. These hill ranges are mostly clothed with the dense forest of mixed deciduous and evergreen forests housing some of the important trees like Dipterocarpus, Artocarpus, Amoora, Elaeocarpus, Syzygium, Eugenia which dominate the top canopy. Large tract of land in forest area show bamboo forest, often interrupted by evergreen or deciduous secondary stand. Cane grows extensively in the wet hollows and amidst evergreen, semi-evergreen and moist deciduous forest. Species of Calamus (guruba, floribundus, ertectus, leptospadix, vimnialis) dominate the thorny thickets. The hill ranges form the watershed for the 10 major rivers like Deo, Dhalai, Fenny, Gumti, Haora, Juri, Khowai, Langai, Manu and Muhuri which originate from these hill ranges and are the lifeline for the state. The areas lying in between the hill ranges forms the productive valleys which mostly from the habitational areas. Tripura also houses a considerable swamp areas and harbour harbaceous species, few shrubs and trees dominated by Albizia, Baringtonia, Lagerstroemia, Macaranga, Mallotus species; herbs and grasses. This shows that the landscape is quite diverse and unique to attract and support tourism. Natural landscape of

Fig 26: A Paper published on National Workshop on River and Water Management for Sustainable Development with Policy perspectives organized by Tripura University on July 3rd and 4th 2019.

Understanding Community structure and resource dependency to Strategize Conservation based Ecotourism for sustainable management of Dumbur Reservoir-A proposed Ramsar site.

Thiru Selvan, Sabyasachi Dasgupta, Francis H Darlong and Divya R,

Abstract

Gumti basin in Tripura, India has led to widespread dispossession, loss of land, extinction of flora and fauna, and demographic impacts on indigenous peoples. The nearby villages constituting the tribal communities are dependent on the nearby forests including the Gumati Wildlife Sanctuary for their livelihood and basic needs. There is an urgent need to conserve the forest while using its components sustainably. The present study was initiated in 14 villages in and around the Dumbur reservoir to understand the community dependency on the lake and adjoining areas and identify the stake holders to initiate ecotourism activities. It is noticed that the area is dominated by tribal communities comprising of Tripura, Reang, Chakma, Jamatia and Molsom-kuki-Marak. Community dependency was noticed to be only on fishing and with very less Jhum cultivation during the recent years. Alternative sources of livelihood have to be taken care of in these areas so as to promote the socio-economic status of the villagers. The ethnicity of communities and availability of rich biodiversity resources has to be mobilised to focus on promoting conservation. Ecotourism can provide the best possible options to conservation of the rich biodiversity by contributing to the socio-economic wellbeing of the ethnic communities. Looking into the community structure, land use pattern and dependency, the stakeholders to ecotourism can be in villages, Ranipukur, Ramnagar, Pachim Potachhara and Paschim raima with their respective dominant ethnic community and suitability of the area.

Keywords: Ecotourism; Community based Conservation; Gumati River; Sustainable Development

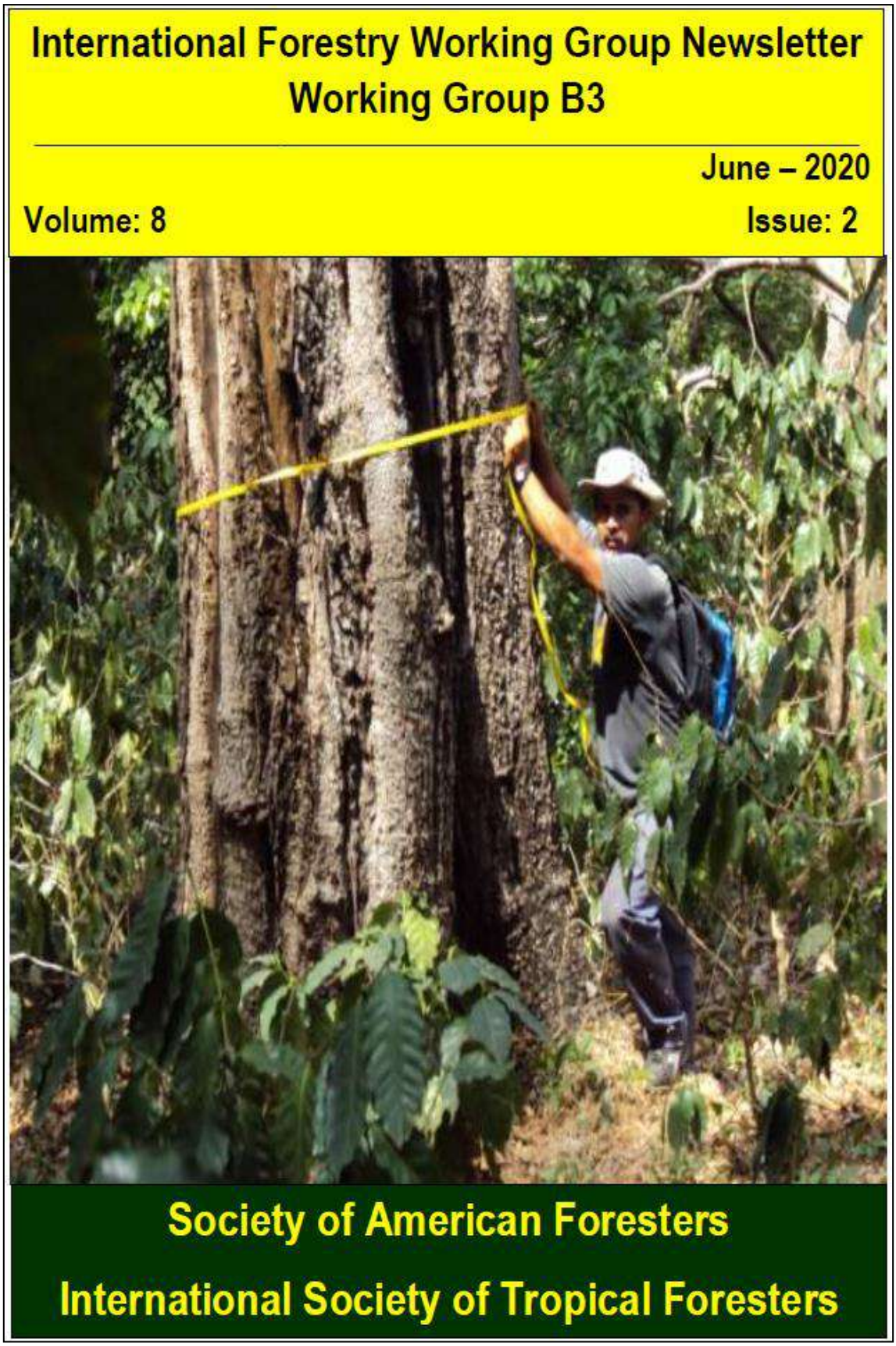
Introduction:

Forests and the adjoining areas surrounding human habitation that supports resources with numerous species and vegetation types are important in the livelihoods of the local people as they depend on forests resources for various products such as fuel wood, construction materials, medicine, and food. Customary forest dwellers and indigenous peoples may define and interpret their environment differently across regions, cultures and generations. Globally, it is estimated that between 1.095 billion and 1.745 billion people depend to varying degrees on forests for their livelihoods and about 200 million indigenous communities are almost fully dependent on forests (Chao, 2012). The same is true with regards to the most of the forest areas in India as well and Tripura in particular where indigenous communities are dependent on them for their livelihood and economy. It is estimated that 20–25% of rural peoples' income is obtained from environmental resources in developing countries (Chao, 2012).

Forests also have a customary and spiritual meaning as a source of livelihood, cultural significance and individual and collective identification (Chao, 2012). Resource users become dependent on certain resources because of their level of attachment to the resource to which they have become accustomed or they have been making use of the resources for their own existence. There have also been community attachment to the resources and each community has promoted the use of certain resource in their own areas or made a part of their CPR which they felt is supreme. Some of the Local people have also adapted to certain occupation based on these resources and has led to great pressure on the limited forest resources. Forest degradation, resource depletion, loss of biodiversity, and resilience in ecosystems has become the major environmental issues.

The Gumti basin is situated in the lower middle part of Tripura. Gumti is the major river of Tripura. The Gumti river and the reservoir created by the Dumboor dam with coverage of approximately 300 kms are surrounded by lush landscape. HEP had submerged about 40 Sq. Km. of land in the year 1976 displacing about 27,000 indigenous farmers. Thousands of tribal people were displaced due to

Fig.27 A published Newsletter from the Project (A-B)



(A)

Conservation based Ecotourism Through Community Participation - A case from Tripura India

ThiruSelvan, Sabyasachi Dasgupta and Kiran Kumar Murasing

Department of Forestry and Biodiversity
Tripura University, Suryamaninagar, Tripura, INDIA-799022

A project entitled "Conservation of Biodiversity and livelihood enhancement through Community based Forest Management and Ecotourism in and around submergence of Small Hydropower project" is being implemented by the Tripura University, Agartala in partnership with Jana UnnayanSamiti Tripura a Social development wing of the Diocese of Agartala and funded by National Mission on Himalayan Studies, implemented by Ministry of Environment, Forest and Climate Change, Nodal and Serving hub with G.B. Pant "National Institute of Himalayan Environment"Kosi-Katarmal, Almora, Uttarakhand. Under this efforts were initiated by the principal author who is the Principal Investigator of the project around Dumburreservoir, Tripura to promote Conservation based Ecotourism through Community participation so that the Livelihood of the people living around this area can be enhanced.

Fig 1:Map of Study area (Gumti basin)

The creation of Dumbur Hydro Electric Project (15 MW) on the river Gomati at Dumboor falls, Tripura, has submerged about 40 Sq. Km. of land in the year 1976 displacing about 27,000 indigenous farmers. This submerged area in due course of time has become a biodiversity rich wetland.But the displaced farmershad to move towards the nearby hills and settled there giving pressure to the forest and forest resources. Due to the lack of other livelihood options they are now overexploiting the existing resources with no control. Some of them even practise slash and burn agriculture on a large scale which is devastating the large stretches of forest (Fig. 3). Part of the study area which falls under the Gumti Wildlife Sanctuary is also facing threat. It is where the concept of Ecotourism originated through community participation so that the indigenous communities living around the reservoir find new way for livelihood option due to the potentiality of this region (Fig. 2).

(B)

Fig 28: Homepage of the Website www.conservationtourism.in

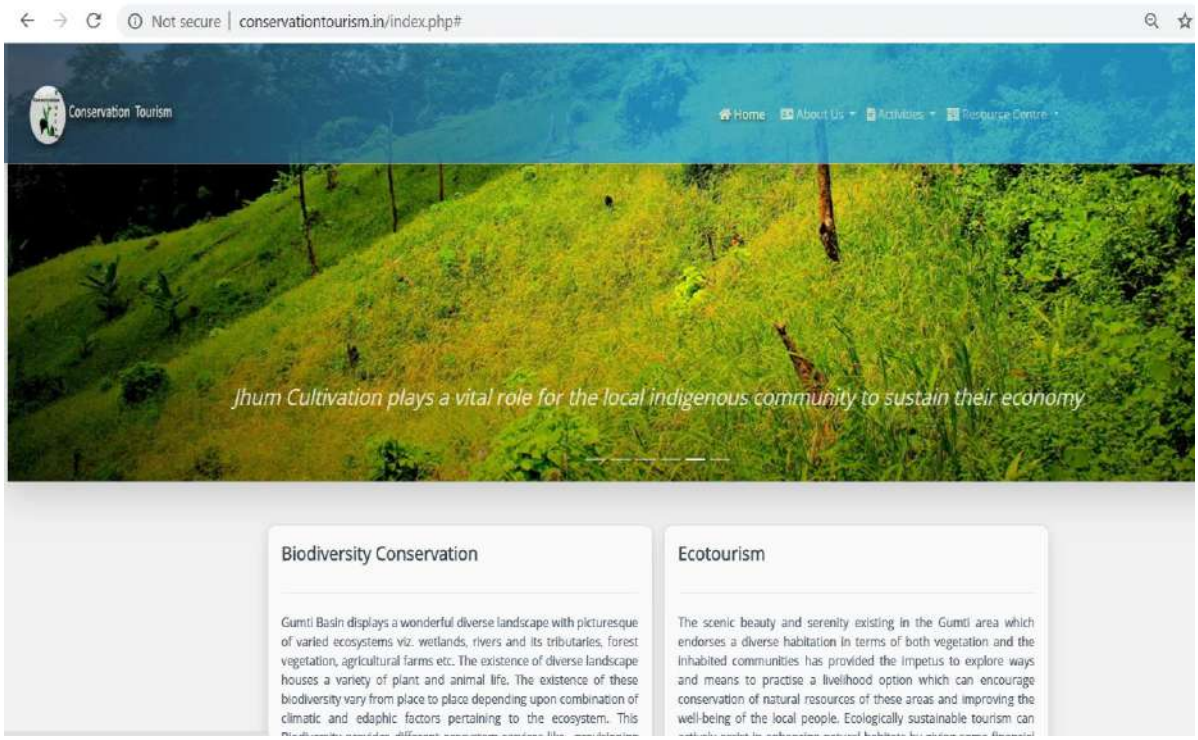


Fig 29: View of Mobile application.

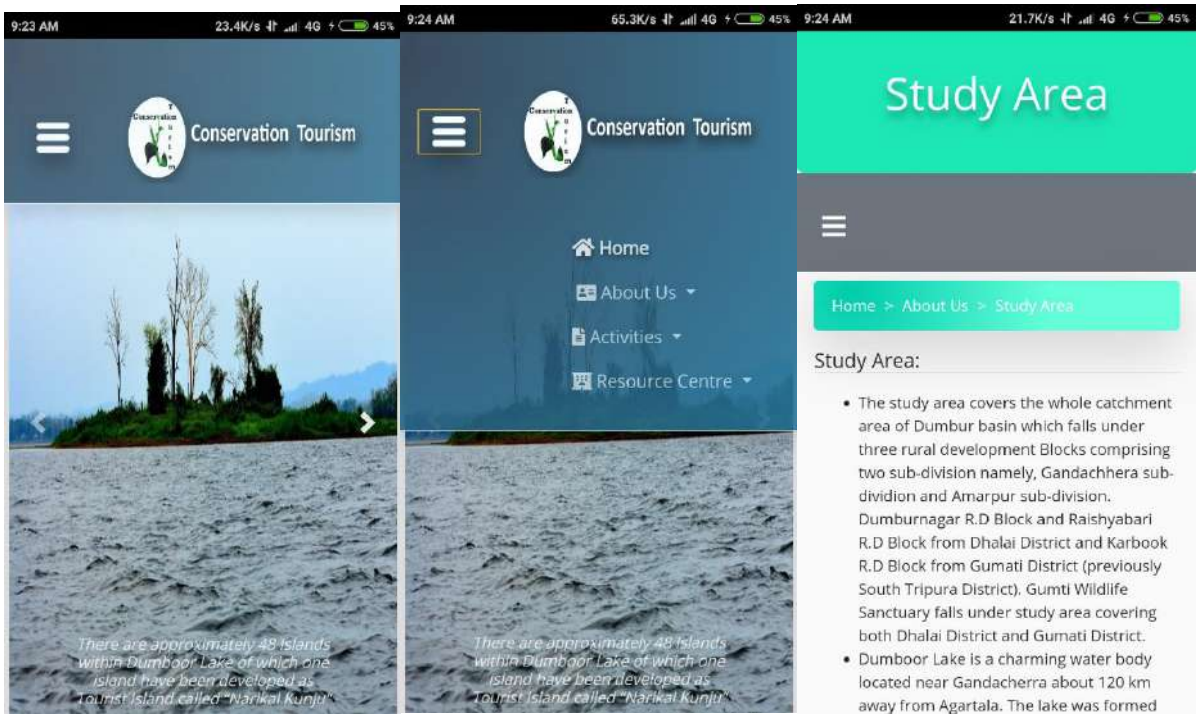


Fig. 30 A documentary released in YouTube under the project

Fig. 31 An Eco-hut constructed at Tarini para for Homestay

NMHS-Himalayan Institutional Project Grant

NMHS-FINAL TECHNICAL REPORT (FTR)- DETAILED REPORT

Demand-Driven Action Research and Demonstrations

NMHS Reference No.	GBPNI/NMHS-2017-18/SG14

Date of Submission:	2	4	1	1	2	0	2	2
	d	**d**	**m**	**m**	**y**	**y**	**y**	**y**

PROJECT TITLE

CONSERVATION OF BIODIVERSITY AND LIVELIHOOD ENHANCEMENT THROUGH COMMUNITY-BASED FOREST MANAGEMENT AND ECOTOURISM IN AND AROUND SUBMERGENCE OF SMALL HYDROPOWER PROJECT

Project Duration: *from* (**01.04.2018**) *to* (**31.03.2021**).

***Submitted to*:**

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Scientist 'G' and Nodal Officer, NMHS-PMU
National Mission on Himalayan Studies, GBP NIHE HQs
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GENERAL INSTRUCTIONS:

1. The Final Technical Report (FTR) has to commence from the date of start of the Project (as per the Sanction Order issued at the start of the project) till its completion. Each detail has to comply with the NMHS Sanction Order.
2. The FTR should be neatly typed (in Arial with font size 11 with 1.5 spacing between the lines) with all details as per the enclosed format for direct reproduction by photo-offset process. Colored Photographs (4-5 good action photographs), tables and graphs should be accommodated within the report or should be annexed with captions. Sketches and diagrammatic illustrations may also be given giving step-by-step details about the methodology followed in technology development/modulation, transfer and training. Any correction or rewriting should be avoided. Please give information under each head in serial order.
3. Training/ Capacity Building Manuals (with details contents of training programme technical details and techniques involved) or any such display material related to project activities along with slides, charts, photographs should be brought at the venue of the Annual Monitoring & Evaluation (M&E) Workshop and sent at the NMHS-PMU, GBP NIHE HQs, Kosi-Katarmal, Almora 263643, Uttarakhand. In all Knowledge Products, the Grant/ Fund support of the NMHS should be duly acknowledged.
4. The FTR Format is in sync with many other essential requirements and norms desired by the Govt. of India time to time, so each section of the NMHS-FTR needs to duly filled by the proponent and verified by the Head of the Lead Implementing Organization/ Institution/ University.
5. Five (5) bound hard copies of the Project Final Technical Report (FTR) and a soft copy should be submitted to the **Nodal Officer, NMHS-PMU, GBP NIHE HQs, Kosi-Katarmal, Almora, Uttarakhand**.

The FTR is to be submitted into following two parts:

Part A – Project Summary Report

Part B – Project Detailed Report

Following Financial and other necessary documents/certificates need to be submitted along with Final Technical Report (FTR):

Annexure I	**Consolidated and Audited Utilization Certificate (UC) & Statement of Expenditure (SE)**, including interest earned for the last Fiscal year including the duly filled GFR-19A (with year-wise break-up)
Annexure II	**Consolidated Interest Earned Certificate**
Annexure III	**Consolidated Assets Certificate** showing the cost of the equipment in Foreign and Indian currency, Date of Purchase, etc. (with break-up as per the NMHS Sanction Order and year wise).
Annexure IV	**List of all the equipment, assets and peripherals** purchased through the NMHS grant with current status of use including location of deployment.
Annexure V	Letter of Head of Institution/Department confirming Transfer of Equipment Purchased under the Project to the Institution/Department
Annexure VI	**Consolidated Manpower Certificate** and **Direct Benefit Transfer (DBT) Details** showing the education background, i.e. NET/GATE etc. qualified or not, Date of joining and leaving, Salary paid per month and per annum (with break up as per the Sanction Order and year-wise).
Annexure VII	**Details, Declaration and Refund of any Unspent Balance transferred through Real-Time Gross System (RTGS) in favor of NMHS GIA General**

DSL: Date of Sanction Letter

2	**8**	**0**	**3**	**2**	**0**	**1**	**8**
d	d	m	m	y	y	y	y

DPC: Date of Project Completion

3	**1**	**0**	**3**	**2**	**0**	**2**	**1**
d	d	m	m	y	y	y	y

PART B: PROJECT DETAILED REPORT

The Detailed report should include an Executive Summary and it should have separate chapters on (i) Introduction (ii) Methodologies, Strategy and Approach (iii) Key Findings and Results (iv) Overall Achievements (v) Project's Impacts in IHR (vi) Exit Strategy and Sustainability (vii) References and (viii) Acknowledgement (It should have a mention of financial grant from the NMHS, MoEF&CC)

Further, description of Technical Activities, List of Trainings/ Workshops/ Seminars with details of trained resources, list of New Products developed under the project, Manual of Standard Operating Procedures (SOPs) developed, Technology developed/Transferred etc should be enclosed as Appendix.

1 EXECUTIVE SUMMARY

The state of Tripura being the lowest part of Indian Himalayan states is having the unique landscapes features and a very high biodiversity in spite of being heavily populated. Studies on various hydroelectric projects (HEPs) at higher elevation are very common but there is no information available from small HEPs at lower elevation covering a large submergence area. Therefore, this study was undertaken to understand the post-submergence plant community structure, avifaunal diversity, their relationship and dependency with ethnic local communities etc. to reduce the pressure of anthropogenic activities not by neglecting them but to provide alternative livelihood option for sustaining their livelihood. The project addressed critical issues and relation between livelihood and biodiversity to build climate resilient strategy for reducing communities and ecosystem vulnerabilities so that overall development can be achieved in the area. In order to improve the adaptive capacity of the ecosystem and also to uplift communities, the project promoted the holistic development planning and management of the natural resources through community participation in conservation which in other way becoming their livelihood opportunities.

In order to implement the community development plans (CDPs) a series of visit, awareness, sensitization and consultation with stakeholders, primary and secondary data collection related to Bioresources and biodiversity information etc. were undertaken to analyze the local situation so as to identify beneficiaries and suitable location for carrying out project activities.

Through sensitization and PRA exercise social awareness has been created and information like, social map, resource map, seasonal calendar etc. were generated to depict the overall social image of the area. In this regard several meetings and trainings were also conducted for personality development, skill development and entrepreneurship development so that community involvement in conservation initiative can be made popular.

Under this project we have generated six base maps related to different features of the area such as Study area and Protected area, Topography, Land use Land cover, Percent Tree cover, Location of villages, and Demography of villages to be utilized for number of applications based on the needs. Three sets of scientific datasets were prepared to list out and analyze the post-submergence biodiversity indices of different taxa. Important bioresources used by different communities in their day-to-day life, their utility, mode of use and parts used etc. were generated through questionnaire-based survey. All the above-mentioned datasets are one of the first ever compilation from this area having huge implication for research and development in near future.

Biodiversity conservation action through community participation is the main objective of the project for which different success stories, documentaries, case studies were made aware to the beneficiaries

and by their collective effort and support from project one location was developed for undertaking ecotourism activities in and around the Dumbur reservoir. An ecotourism management committee named “Leinghoihthai” was formed at Tarini Reang Para of Gandachara, Dhalai district, Tripura to carry out homestay-based ecotourism activities.

The infrastructure developed through this project can be scaled up and replicated by linking different other communities such as, Tripura, Jamatia, Chakma, Molsom or by associating other stakeholders associated to this network. For the quality improvement the stakeholders can imitate some success stories or visit the areas of successful case studies in ecotourism. As ecotourism is one of the most effective ways to utilize ecosystem services giving no harm to both environment and traveler by which it can easily be disseminated anywhere by improving the quality of ecosystem services of that specific area.

The result of this project wants to recommend some important points. Such as

- Permanent structure for eco-hut facility can be provided to the community through different govt. schemes. To reduce the anthropogenic pressure on natural forest areas, ecotourism and its associated industries such as handicraft, weaving, poultry, piggery, fishery, farming etc. can also be developed on a large scale by providing infrastructural supports and value additions.
- The facility of Homestay can be persuaded to be taken up by other predominant communities of the region so that it can boast the economy and social well-being of the people.
- Livelihood options are quite limited in this region and ecotourism should be promoted with developing the cultural heritage, art and artifacts etc. so that it catches the eyes of the outside world with promotion of multiple stakeholders.
- Road connectivity in most of the villages including Raishyabari which is a rural development block under Gandachara sub-division needs to be improved.
- Lack of frequent electricity with sufficient voltages is one of the major disadvantages in most of the areas of the study site.
- As Dumbur area is one of the most potential areas of ecotourism in the state and government should create a network for livelihood opportunities by developing infrastructures, connecting proper roads and electricity. Moreover, people should have a social mindset of entrepreneur, so that they may see the scope and opportunities for ecotourism in a broader prospect.

2 INTRODUCTION

2.1 Background of the Project

Dumbur HEP (15 MW) located at Dumbur on the river Gomati at Dumbur falls, Tripura is one of such HEP which has submerged about 40 Sq. Km. of land in the year 1976, displacing about 27,000 indigenous farmers. This submerged area has become a biodiversity-rich wetland in due course of time. The settlement around this wetland depicts a poor socio-economic profile of people adjoining the region. The area's populations in the absence of sustainable livelihood are overexploiting the resources from the submerged zone, ultimately putting threats to the area's biodiversity, especially to avifauna. At the same time, adjoining Gumti WLS puts restrictions for the local people to venture into terrestrial forest resources.

The Gumti River and the reservoir created by the Dumbur dam with approximately 300 km are surrounded by lush landscape. This colossal water body attracts many residents and migratory birds from far places. The river is a rich reservoir of natural and cultured fishes. The area is a hallmark of the state's natural heritage and testifies the diverse wildlife.

Due to deforestation in the catchment, about half of the reservoir has silted up, creating shallow zones that are very attractive for waders and ducks. The site has more than 51 avian species. This site qualifies for A1 and A4 criteria. Lesser Adjutant (*Leptoptilos javanicus*), a Vulnerable species, and Darter (*Anhinga melanogaster*), a Near Threatened species (Bird Life International 2001), are present in good numbers. The forested part of the nearby areas, including the Gumti Wildlife Sanctuary, serves as the reservoir's catchment area, and the Gumti River is rich in non-human primates. The species are Phayre's Langur or Leaf Monkey (*Trachypithecus phayrei*), Capped Langur (*Trachypithecus pileatus*), Hoolock Gibbon (*Hylobates hoolock*), Pig-tailed Macaque (*Macaca nemestrina*), Rhesus Macaque (*Macaca mulatta*), Slow Loris (*Nycticebus coucang*). Leopard (*Panthera pardus*) is the largest predator. Barking Deer (*Muntiacus muntjak)* is known to occur. The Asiatic Elephant (*Elephas maximus)* is an occasional visitor.

2.2 Overview of the Major Issues to be Addressed

The indigenous people were displaced due to the submergence of land under the Dumbur HEP. The people so displaced settled adjoining the reservoir. The populations of the area were devoid of sustainable livelihood since then. Later on, due to unavailability of required storage, the power generation was stopped and the project is considered as non-viable. In absence of power generation, it was seen that the management of this lake and adjacent area went down in priority list consequently affecting the livelihood of local community. This resulted in increased pressure on the nearby protected areas with high

biodiversity. Also, migration of educated mass is leading to gradual decrease in manpower especially in the area of agricultural cultivation. Per capita small land holding, fragile hilly terrain does not allow intensive agricultural practices but in absence of other alternative, people are forced to do Jhum / shifting cultivation and the result is excessive silt deposition and making the HEP non-viable. The nearby villages which mostly constitute tribal communities are largely dependent on the nearby forests including Gumti Wildlife Sanctuary for their livelihood and daily basic needs. The tourism infrastructure of the area is very weak due to which the tourist attraction of the area is very meager. Due to these various factors, there is a proposal by National Hydropower Corporation (NHPC) and North Eastern Electric Power Corporation (NEEPCO) to de-commission the power plant, dismantle the dam and revert back the submerged areas to the villagers. In both there is an immediate need to generate sustainable livelihood for the local people so that it can improve the socio-economic condition of the local residents thereby bringing in conservation of the natural resources available in the nearby area.

As the hydropower project is not generating power up to the expectation and already crossed its life there is an urgent need to look for alternative use of this vast landscape and the reservoir for the sustainable economy of the local residents while conserving the biodiversity of the area. This project aims to bring impact in livelihood, socio-economy, biodiversity, forest & wildlife, natural resources and environment etc. through documentation of bioresources, community participation in Common Property Resource management with special emphasis on terrestrial activity based economy generation and by reducing pressure on protected area & conservation sensitization through Homestay based replicable Ecotourism model.

2.3 Baseline Data and Project Scope

Gomati is considered to be a sacred river and is the largest, longest and the most important river in the state of Tripura. The Gomati (Dumbur) basin is situated in the lower middle part of Tripura. The basin lies in the districts of Gomati and Dhalai spreading from eastern to western boundary of the state. It is located between latitudes 23º19′ and 23º47′ N and longitudes 91º14′ E and 91º58′ E. The Gomati basin is surrounded by Bangladesh on its east and west. Some of the most fertile agricultural lands in the state are part of the alluvial deposits laid down by the river. The Gomati River and the reservoir created by the Dumbur dam with coverage of approximately 300 kms are surrounded by lush landscape. HEP had submerged about 40 Sq. Km. of land in the year 1976 displacing about 27,000 indigenous farmers. Thousands of tribal people were displaced due to the project that also disturbed the fragile ecology of the region. The river is a rich reservoir of natural and culture fishes. The area is a hallmark of the natural heritage of the state and testifies the diverse wildlife.

The nearby villages which mostly constitute the tribal communities are largely dependent on the forest of the nearby areas including the Gumti WLS for their livelihood and daily basic needs. The tourism infrastructure of the area is very weak due to which the tourist attraction for the area is very meagre. Thus, there is an urgent need to conserve the forests while using its components sustainably. With the above

background in mind the present study was initiated to understand the community dependency on the lake and adjoining areas and to try identifying the stake holders on the basis of indicators to initiate ecotourism activities.

After delineation of the basin areas using free GIS data sets and census data we could see that whole basin consists of an area of 550.70 Sq. Km. housing 40 Villages which falls under three blocks Viz. Dumburnagar RD Block, Raishyabari R. D. Block and Karbook RD Block of the districts of Dhallai and Gomati. It can also be seen that there are 14 villages comprising 245.82 Sq Km which are in and around the Dumbur reservoir which formed the major area for our present study.

The Land use pattern noticed from areas around the lake are recorded to fall into deciduous broad leaved forest, crop land, mixed forest, shrub land, evergreen broad leaved forest and plantations (Fig. 1). The vegetation prevalent with respect to the villages is represented in Table 1. It is also seen that the per cent tree cover adjoining the reservoir is less compared to areas farther than the reservoir (Fig. 2). Since the flooded area varies from year to year and season to season, those areas which are subject to flooding are mostly under very limited tree cover. The tree cover is more in areas where there is very little or no human habitation and there is very little dependency on the tree resources.

Table 1 Land use prevalent in the villages in and around Dumbur reservoir

Types of Land use/ Vegetation	**Villages**
Deciduous Broad leaf forest	Purba Kalajhari, Thakurchhara, Kamalasram, Ranipukur and Ramnagar, Jarimura, Pachim Raima and Kamalasram
Cropland	Ranipukur, Ramnagar, Purba Pottachara, very few patches in Pachim Potachhara and Kamalasram
Mixed Forest	Few patches in Kamlashram, Thakurchhara, Purba Kalajhari, Kedherkot, Ramnagar, Mukchhari
Shrub Land	Majority found in Kamlashram,Thakurchhara, Purba Kalajhari, Kedher Kot, Ramnagar, Muckchhari
Plantation	Majority of the area is under plantation in Purba Potachhara and Purba Raima, with very few patches in Ramnagar and Kedharkot
Evergreen Broad leaf forest	Purba Kalajhari, With limited patch around the Reservoir in Chakpur, Pochim Potachhara, Purba Raima, Mukchari and Kedharkot

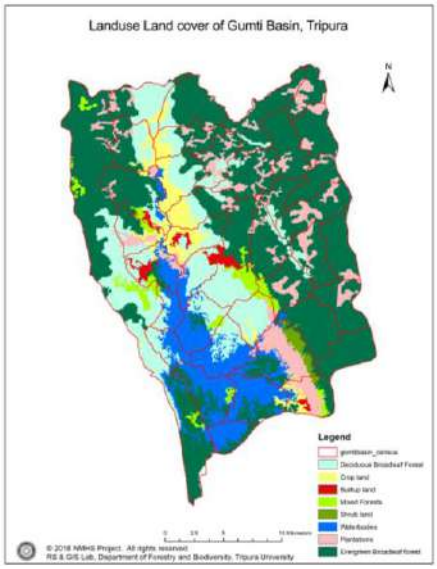

Fig 1. Land use/land cover of the Gumti Basin, Tripura, India.

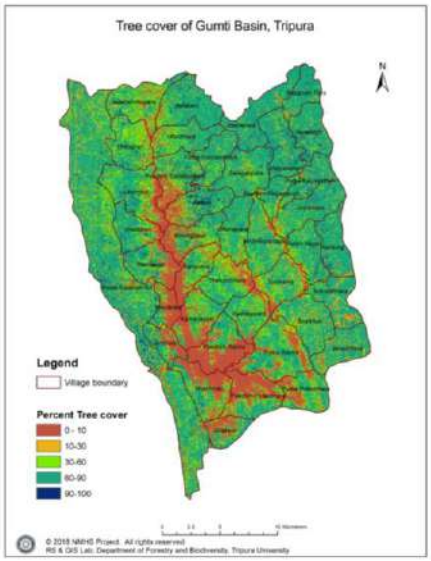

Fig. 2.Tree cover of Gumti Basin, Tripura, India.

There are 11 main market viz Ganga Nagar, Jagabhandhu, Gandachara, Ram Nagar, Narayan Pur, Twi Chakma, Raisyabari, Pancharatan, Boal Khali, Ratan Nagar, Hati Matta which receives the supply of the resources extracted directly or indirectly from the catchment areas. The main sellers in these markets belong to Tripura and Reang community with Chakma, Marak, Jamatia, and Bengali, in few numbers. The products which reach the primary markets are supplied to places like Amarpur, Udaipur, Ambassa, Ompi, Belonia etc. People form Jarimura, Mukchhari and Chakpur sometime supply to Amarpur and Udaipur. During June – November the market supply is high due to more produce from the Jhum areas. Jagabhandu, Gandachera, Ramnagar and Pancharatan are the dominant markets which mainly deal with the resources from the areas in and around the reservoir.

The project will generate information on the availability and use of different bioresources by the different communities of the region. The study will encourage the cultivation of some of the bioresources in their own areas so as to restrict the dependency of the bioresources from the forest areas. Since this is a study first of its kind in this region, it will highlight the availability and market structure of different resources available. Moreover, it will help bringing in traders and industrialists from outside who can use these resources to generate value added products which can provide better prices for the produce. The practice of ecotourism will open the door for multiple livelihood options by encouraging the production of traditional items may it be handicraft, artifacts, jewelry, textile products, etc. Thus the people will be encouraged to produce more diverse and high value products to specially cater to the needs of the tourists. The communities will also get the chance to interact with the visitors from outside and so will be able to learn many new things and develop new ideas. It will open scope for Local inhabitants to run an Ecotourism management committee which they can replicate in other areas. Key findings of this project can be utilized

by Central and State Government both, Educational Institutions, Ministry of Rural Development, Ministry of Environment, Forests & Climatic Change etc.

2.4 Project Objectives and Target Deliverables (as per the NMHS Sanction Order)

Project Objectives	Quantifiable Deliverables	Monitoring Indicators
• Quantification and mapping of important bioresources of Dumbur HEP Catchment; • Skill development and livelihood enhancement of tribal and ethnic community living around the submerged area; • Biodiversity Conservation action through community participation.	• Documentation/ Data base of bioresources HEP catchment; • Community based Biodiversity conservation model; • Reduced pressure on protected area and conservation sensitization through ecotourism; • Model development for sustainable management of submergence area after the projected life of HEP.	Monitoring in comparison to the baseline information to be provided by the proponent in the 1st Quarter: • No. of New Database/ Datasets/ Maps for the target sites and generated on quantification and mapping status of Bioresources; etc.; • Demonstrative models/ Long-term protocols (No.) *viz*., CPR Management Model; Biodiversity Conservation Action Model and Practices; • No. of Trainings or workshops conducted on Skill Development and Livelihood Generation, • No. of Stakeholders benefitted (No. of Rural Youth, No. of Women, and Total No. of Beneficiaries) including update on income generation (Rs./ person); • Policy framework/ draft (No.) for Biodiversity Conservation Action Plan through Community Participation; • Other Publications and Knowledge Products (Nos.) on the identified biodiversity indices.

3 METHODOLOGIES, STARTEGY AND APPROACH

3.1 Methodologies used for the study

Studies on the HEPs at the higher elevation are common but there is no significant information available for small HEPs at lower elevation having a large submergence. In order to address the challenges faced by the conservation initiatives and developmental activities it was becoming increasingly important to generate knowhow about the existing biodiversity due to the impact of artificial submergence and to develop strategy for sustainable management of bioresources for livelihood initiatives which can be in harmony with natural process. With the above background the following methodologies were formulated to meet the prescribed objectives through different activities:

Objective	**Activity**	**Activity wise brief Methodology**
Quantification and mapping of important bioresources of Dumbur HEP Catchment	Biodiversity survey	Grid and transect based survey for different taxonomic group: Quadrat and transect based survey for Plant Resources (Trees, Shrubs, Herbs)
	Sensitisation programme	PRA, Screening of documentary, Distribution of pamphlets etc., Hands on training for monitoring of biodiversity components, Popular Talks in schools, panchayat bhawan etc.
Skill development and livelihood enhancement of tribal and ethnic community living around the submerged area	Entrepreneurship development	Snow ball sampling, PRA exercise, identification of potential houses for developing home stay facility and modification of existing facility for ecotourism. Training the potential family member preferably women. Ecotourism facility will be developed in two locations around Dumbur
	Skill development	Identification of educated youths preferably persons with multiple language skills. Guide training for bird watching, ecosystem monitoring and narration etc.
Biodiversity Conservation action through community participation	Community involvement with Govt. dept.	Forming ecotourism management committee with different stakeholders and registering the committee as registered SHG under societies act. One Ecotourism management Committee
	Conservation initiative	Indicator species identification after analysing data collected on biodiversity components. Target species as indicators;
	Report Writing	Database creation, analysis, expert opinion, stake holder consultation

3.2 Preparatory Actions and Agencies Involved

Before the inception of the project the proposals did exist with the state government but except fisheries related activities there were not much activities existing in the area. In addition to this there were proposals by the Tripura Govt. in the area of beautification of the lake which can become helpful for executing this HEP. In order to circumvent to the existing initiatives various preparatory actions were identified and framed so as to clarify the role of different organization or individuals involved in the project. Most of the activities such as collection of scientific data, biodiversity survey, sensitization programme, entrepreneurship development, skill development, conservation initiative etc. were done by Tripura University which was assisted by Jana Unnayan Samiti (JUST), Agartala from time to time. With a long term motive to reduce the impact of the existing communities on the bioresources of the forest areas in and around the HEP an "Ecotourism management committee" was also to be formed with the soul objective of creating a model which will cater to the livelihood enhancement of the region so that such models can be replicated/taken up in future. The motive was also to improve the socioeconomic status of the communities. Initially consultations were carried out with different agencies, departments, institute etc. for better understanding of the ground situation and to draft a management strategy. Beneficiaries who will be benefited through this project were:

- Indigenous/ Rural Communities
- Tourism Industries
- Research Institutes
- Government Agencies
- Non-government Agencies

Key activities of the agencies involved in this project are mentioned in the following table:

Key Activities	**Description on how it will be done, with whom etc.**
Biodiversity survey	Survey was carried out by Tripura University with assistance from Jana Unnayan Samiti (JUST)
Sensitisation programme	Sensitization Programme, PRA exercise, Screening of Documentary videos, Hands on training for monitoring Biodiversity components, Popular talks in schools & beneficiaries villages were done by Tripura University with support from JUST;
Entrepreneurship development	An Ecotourism management committee was formed at Tarini para, Gandachara, Dhalai Tripura and an Ecohut facility was developed by Tripura University with support of JUST for livelihood and entrepreneurship development

Skill development	Training was done by Tripura University
Conservation initiative	Indicator species identification after analysing data collected on Bioresource and Biodiversity component was done by Tripura University
Report Writing	Baseline information and database creation and evaluation of present work, expert opinion and consultation of stakeholders were done by Tripura University

3.3 Details of Scientific data collected and Equipment Used

Details of the Scientific data collected on Quantification and mapping of important bioresources of Dumbur HEP Catchment; Skill development and livelihood enhancement of tribal and ethnic community living around the submerged area and Biodiversity Conservation action through community participation are mentioned in the ANNEXURE-1 of Appendix 8

3.4 Primary Data Collected

Primary data was collected through questionnaire based survey and though Biodiversity assessment methods. Bioresources in beneficiary villages and in different local bioresource markets of the area were done through questionnaire. Natural bioresource information were assessed through transect & quadrat-based survey. Refer ANNEXURE: 2 of Appendix 8

3.5 Details of Field Survey arranged

Field survey was arranged for implementing different activities in the project site. The details of the field activities are mentioned below:

1. **Reconnaissance Survey**: Before collection of primary data from the field site a reconnaissance survey was conducted to select the best possible location for carrying out field activities.

2. **Household Survey**: A questionnaire based household survey was carried out in numbers of villages adjoining the Dumbur reservoir which constitutes the different indigenous communities viz., Reang, Tripura, Chakma, Jamatia and Molsom to prepare a checklist of local bioresources.

3. **Market Survey**: Market survey was carried out at different bioresource market viz., Gandachara hati, Jagabandhu hati, Kalajhari hati, Twi chakma hati, Raishyabari hati, Hatimatha (Mayung bokhorok) hati, Narayanpur hati etc. to list out the local bioresources sold in the market.

4. **Stakeholders Consultation**: After the reconnaissance survey some villages were selected to identify the local stakeholders/community who will be capable of taking up the initiative of

ecotourism activity for sustaining the local livelihood which would in turn lead to conservation of existing natural bioresources.

5. **Biodiversity Assessment**: Quadrat based survey was done to assess the plant diversity and transect based survey was carried out to find the diversity of various avifauna and other important wild animals.

6. **PRA Exercise**: To prepare Social map, Resource Map, Seasonal Calendar, Historical timeline etc. PRA exercise was organized at different beneficiary villages.

7. **Creation of Ecotourism facility**: Based on the stakeholder's consultation one Ecotourism management committee was supposed to be formed in the study site which can take up the Ecotourism activities which will form as a model for the livelihood enhancement of the community. This would in turn promote the socioeconomic condition of the people by promotion and marketing of the local resources.

8. Details of the field visit conducted to the field site are given in the following table:

Date	**Purpose**
April 2018	Stakeholders Consultation- Local communities, JUST
August 2018	Stakeholders Consultation- Local communities, JUST
September 2018	Market survey of Bioresources
October 2018	Field visits for documentation of flora available in Jhum area.
December 2018	Selection of sites/villages and families for conducting PRA Exercise and for support of homestay, respectively
February & March 2019	Establishment of Field Basecamp Rapport building at the villages viz. Tarini para, Niruha Chowdhury Para from Pancharatan VC, Mohanta para, Ramnagar Bazar, Dhanbabu para, Jibakarta para and Manubhakta para from Ramnagar VC, Monadhan para and Rupadhan para from Rani pukur VC, Sambhajoy para from Chitrajhari VC, Tribagya para from Kalajhari VC Mandul para from Dhalajhari, Jagabandu and Raishyabari Questionnaire survey was carried out at villages viz. Tarini para, Rupadhan Chakma para and Tribaigya para. Traders interview/market survey

	Awareness program was organised at Manubakta para and Tarini para. Screening of documentaries in the villages for awareness campaign and to focus attention on attitudinal change of the villagers
June & July 2019	Transect and Quadrat based survey Identification of beneficiaries for the establishment of ecohut Identification of educated youth
February 2020	Popular talks and the screening of documentary Awareness programmes and Distribution of Leaflets & Pamphlets
March 2020	Identification of potential youth and formation of an Ecotourism management committee Market survey for Bioresource
November & December 2020	Market survey of bioresource at Jagabandhu Bazar, Ramnagar Bazar, Gandachara Bazar and Narayanpur Bazar etc. Meetings with beneficiaries for establishment of Eco-hut, registration of society and for conducting Entrepreneurship & Skill development training at Monafa, Ranjit Roaja Para, Tarini Para and RaS Noadhan Roaja Para. "One day training cum workshop on Community based Forest Management & Ecotourism as alternative livelihood option" programme was organised on 12th December 2020.
January, February and March 2021	Questionnaire survey was carried out at Manubakta para, Chaplingchara, Gudhamjoy para, Charanda Roaja Para, Ranjit roaja para, Bhakta para etc. PRA Exercise were Conducted at 9 different locations viz. Chaplingchara, Charanda Roaja Para, Monafa, RaS Noadhan Para, Gudhamjoy Para, Tarini Para, Bhakta Para, Monmohan Para and Dhanbabu Para. Social map, Resource map and Seasonal calendar were prepared through their participation. Transect and quadrat-based survey carried out for Biodiversity assessment.

3.6 Strategic Planning for each Activities

Strategic planning for each activities are given in the following table:

Activity	Methodology	Focus Area of Action	Performance Indicators	Key beneficiaries	Expected Results
Biodiversity survey	Grid and transect based survey for different taxonomic group: Quadrat and transect based survey for Plant Resources (Trees, Shrubs, Herbs) 10% of the area around the lake will be assessed	Biodiversity assessment, Knowledge on NTFP's, threat estimation, and Ecological diversity	Checklist, Pictorial Database, Diversity Indices	Local inhabitants, Central and State Government both; Educational Institutions, Ministry of Rural Development; Ministry of Environment, Forests & CC;	Database on Plant and animal diversity
Sensitisation programme	PRA, Screening of documentary, Distribution of pamphlets etc., Hands on training for monitoring of biodiversity components, Popular Talks in schools, panchayat bhawan etc. 10 Villages will be sensitized	Documentation for general awareness and extension activities	Change in attitude- to be monitored through yearly survey	Ecosystem components, Entry point activities, PRI, Forest Department, Protected Area Management	Attitude of the PAFs and forest dwellers.
Entrepreneurship development	Snow ball sampling, PRA exercise, identification of potential houses for developing home stay facility and modification of existing facility for ecotourism. Training the potential family member preferably women. Ecotourism facility will be developed in two locations around Dumbur	Livelihood enhancement	Number of entrepreneur involved in Ecotourism initiatives, Volunteers turn up	Forest department, Tourism Department, Rural Development Department	Potential Entrepreneur practising Ecotourism
Skill development	Identification of educated youths preferably persons with multiple language skills. Guide training for bird watching, ecosystem monitoring and narration etc. At least 10 Educated unemployed youth will be trained	Human Resource Development	Regular Feedback from tourists and other user agencies	Forest department, Tourism Department, Rural Development Department	Ecosystem monitoring
Community involvement with Govt. dept.	Forming ecotourism management committee with different stakeholders. One Ecotourism management Committee	Community participation	Number of conflicting cases in implementation of different Government projects in the area.	Forest department, Tourism Department, Rural Development Department	Community Involvement

Conservation initiative	Indicator species identification after analysing data collected on biodiversity components.	Genetic Resource Conservation	Conservation status of indicator species, Ecosystem health	Forest department, Tourism Department, Rural Development Department	Declared indicators; Enrichment Plantation
Report Writing	Database creation, analysis, expert opinion, stake holder consultation	Reporting in time	Final Report	Forest department, Tourism Department, Rural Development Department	Report will act as Model document for similar areas

3.7 Activity wise Time frame followed [using Gantt/ PERT Chart

Activity	Quarter											
	1	2	3	4	5	6	7	8	9	10	11	12
Recruitment of Staff												
Biodiversity survey												
Biodiversity assessment, Knowledge on NTFP's, threat estimation, and Ecological diversity												
Sensitisation programme												
PRA, Screening of documentary, Distribution of pamphlets etc., Hands on training for monitoring of biodiversity components, Popular Talks in schools, panchayat bhawan etc.												
Entrepreneurship development												
S Noow ball sampling after PRA exercise, identification of potential houses for developing home stay facility and modification of existing facility for ecotourism. Training the potential family member preferably women.												
Skill development												
Identification of educated youths preferably persons with multiple language skills. Guide training for bird watching, ecosystem monitoring and narration etc.												

Community involvement with Govt. dept.												
Forming ecotourism management committee with different stakeholders.												
Conservation initiative												
Indicator species identification after analysing data collected on biodiversity components.												
Final Evaluation of the project activities												
PRA Exercise												
Report Writing												

4. KEY FINDINGS AND RESULTS

3.8 Major Research Findings

A baseline survey and situation analysis was undertaken around Dumbur reservoir. A general checklist on different bioresources used by different communities either cultivated or collected from natural sources in the form of food, fodder, medicine, construction material, firewood and other NTFPs were prepared through Questionnaire based Household and market survey, PRA exercise etc. In addition to that a general checklist on the natural diversity of bioresources were also assessed from the field and updated.

Herb Vegetation Analysis:

A total of 4665 individuals of 112 species belonging to 53 families were reported from the present investigation of Herb species. Asteraceae family had the highest number of species (10), followed by Zingiberaceae (8) and poaceae (7). Whereas, family Poaceae had the highest number of individual (1253 nos) followed by Fabaceae (386 nos) and Asteraceae (279 nos). Highest Frequency (45.45), Density (11.20) Abundance (24.65), and IVI (17.24) were found in *Imperata cylindrica* (L.) Raeusch. A/F value was found to be highest in *Stachytarpheta australis* i.e., 6.27 and the lowest in *Thysanolaena latifolia* i.e., 0.13. Highest number of species (50 species) was found in Transect 11 and lowest (11 species) in Transect 3. Transect 1 showed the highest number of individual (652), whereas, Transect 7 showed the lowest number of individual (208). Dominance was found highest in Transect number 4 (0.1762) and lowest in Transect number 10 (0.04261). Simpson's Index was found highest at T10 and lowest at T4. Highest Shannon's Index valued 3.47 at T11 and lowest valued 2.09 at T3. The value of Evenness was highest at T10 (0.85) and lowest at T4 (0.53).

Shrub Vegetation Analysis:

A total of 51 species consisting 2193 individuals belonging to 20 families were reported from the present investigation of Shrub species. Fabaceae family had the highest number of species (9), followed by Lamiaceae (5) and poaceae (4). Whereas, family Asteraceae had the highest number of individual (541 nos) followed by Poaceae (327 nos) and Lamiaceae (302 nos). Highest Frequency (77.27) and Density (11.77) was found in *Chromolaena odorata*. Abundance was highest for *Melocanna bacifera* (16.14). *Chromolaena odorata* also showed the highest value of IVI (42.48) followed by *Lantana camara* (25.55) and *Clerodendrum viscosum* (23.40). A/F value or Distribution pattern was found to be highest in *Bambusa polymorpha* i.e., 4.73 and the lowest in *Ziziphus oenoplia* i.e., 0.10. Highest number of species was found in T10 (30 species) and lowest at T1 (7 species). Transect 11 showed the highest number of individual (266), whereas, T6 showed the lowest number of individuals (132). Dominance was found highest at Transect 3 (0.31) followed by T2 (0.22) and T4 (0.22). Simpson's Index was found highest at T9 (0.91) and

lowest at T3 (0.69). Highest Shannon's Index valued 2.84 at T10 and lowest valued 1.34 at T3. The value of Evenness was highest at T1 (0.87) and lowest at T8 and T11 (0.52).

Tree Vegetation Analysis:

A total of 64 tree species consisting 470 individual belonging to 26 families were reported from the present investigation. Moraceae family had the highest number (10) of species followed by Euphorbiaceae (8) and Fabaceae (8). Family Euphorbiaceae had the highest number of individuals (68) followed by Lythraeae (60) and Lamiaceae (58). Highest frequency was found in *Lagerstroemia parviflora* (40.91) followed by *Albizia procera* (29.55). Density was highest at *Lagerstroemia parviflora (1.34) followed by Tectona grandis* (0.86) *and Hevea brasiliensis* (0.82). Highest Abundance was found in *Hevea brasiliensis* (32.69) followed by *Tectona grandis* (14.90). Value of IVI was found highest for *Lagerstroemia parviflora,* followed by *Ficus auriculata* and *Albizia procera.* FIV was highest at *Ficus auriculata* (32.77) followed by *Artocarpus heterophyllus* (21.45)*.* A/F value is highest for *Hevea brasiliensis* and lowest for *Albizia procera.* Highest number of species were found in T8 (22) and lowest number at T1 (3). Highest number of individuals were present in T2 (73) and lowest number of individuals at T3 (11). T1 showed highest dominance with value 0.39 and lowest value of dominance 0.06 at T8. The highest value of Simpson's index was 0.94 at T8 followed by 0.93 at T9 and 0.90 at T4. Shannon index was found highest at T8 (2.97) and lowest at T1 (0.01). The value of evenness was highest at T3 i.e., 0.99 and lowest at T7 i.e., 0.45.

3.9 Key Results

- The project resulted in developing a model for nature-based ecotourism in one location near the reservoir which can be further developed and replicated bringing awareness among the communities.
- Bioresource survey- Checklist of the bioresources cultivated in jhum, home garden, agricultural field or collected from natural sources were documented though Questionnaire based survey and PRA exercise.
- Biodiversity survey- Database on Plant diversity, Avifauna and some major faunal species were prepared through transect and quadrat-based analysis.
- Sensitization Programme- attitude and awareness about the conservation of the forest resources among the people affected by flooding of the waterbody and forest dwellers was noticed to have been changed after conducting sensitization programme like, Screening of documentary, distribution of leaflets and pamphlets, popular talks in schools and villages, PRA exercise etc.
- PRA exercise resulted in preparation of Social map, Resource map and Seasonal calendar of the beneficiary villages.

- Entrepreneurship development- one ecotourism facility was started after the selection of the potential households, site, and training the potential family members.

- Skill development- workshop cum training was organized for developing human resource by changing attitude towards the monitoring of Ecosystem.

- Community involvement with Govt. Dept..- one ecotourism management committee was formed at Tarini Reang Para so as to involve the community in ecotourism activity with the motive of improving their livelihood opportunities so as to benefit with their socio-economic status This also helped the households to come together and work as a community model.

- Conservation initiative- Awareness and Sensitization programmes were organized with the villagers for growing underutilized fruits and vegetables in their kitchen garden and also in Jhum lands which prevented them from venturing long distances to the nearby forests for collection of resources. This finally saved their valuable time by devoting to other livelihood practices.

3.10 Conclusion of the study

- Six base maps namely, Study area and Protected area, Topography, Land use Land cover, Percent Tree cover, Location of villages, and Demography of villages were generated through ArcGIS. This information can be utilized for number of applications based on the need of any researcher, institution, various govt. and non-govt. agencies etc.

- Data base on natural plant diversity of herb, shrub and tree species were generated using the standard scientific procedures which is one of the first ever compilation of its type in this area.

- The effort has also resulted in listing out of different avifauna present in the study site and also their diversity and distribution pattern in the area. This will make a way easier and quicker for any researcher to conduct successive research on avifauna such as feeding ecology, nesting ecology, predator and prey relationship, reproductive behavior etc.

- Our present study also covered the census of major wildlife population in Gumti Wildlife Sanctuary Tripura. The result estimated that the total population of Jungle cat is highest followed by Leopard cat and Wild boar.

- Dependency of the indigenous communities on the local bioresources was found to be very high. List of several important bioresources which were cultivated in kitchen garden or in Jhum field, extracted or collected from forest, sold in the market by the local vendors etc. were all listed out and further it is suggested for more extensive research and development so that the importance and utility of such resources may be visualized for bioprospecting.

- Through awareness programmes beneficiary villages were sensitized and attitude of people have been changed which can be seen through their contribution for taking up an ecotourism initiative.
- Training cum workshop organized for skill development in different aspect of livelihood option will make a way for developing small scale entrepreneurship associated with homestay-based ecotourism.
- Through the display of documentary videos and other publicity materials the roles of women in all social activities were depicted which has resulted in increasing the number of women participation during the PRA exercise.
- PRA exercise conducted in beneficiary villages has generated valuable information such as social map, resource map, seasonal calendar etc.
- This project has contributed directly or indirectly in sustaining ecosystem services, reducing risks and mitigating climate change by ensuring sustainable livelihood to the local communities.

5. OVERALL ACHIEVEMENTS

3.11 Achievement on Project Objectives [Defining contribution of deliverables in overall Mission]

- Quantification and mapping of important bioresources of Dumbur HEP Catchment- Baseline information were compiled using the secondary literature. Information on local bioresource used by indigenous communities living in the area was documented through household questionnaire survey and bioresource market survey. Faunal and floral diversity information were documented using the line transect method and quadrat-based sampling. Six (06) base maps were generated with the help of ArcGIS. Three (03) Biodiversity datasets and one (01) Bioresource dataset was prepared.

- Skill development and livelihood enhancement of tribal and ethnic community living around the submerged area- Six Sensitization Programmes (02 in School and 04 in beneficiary villages) were conducted for bringing awareness among the aged people and also among the new generation about the importance of the conservation of natural resources present in the area. One day training cum workshop programme was organised to enhance the knowledge and skill of the local community. PRA exercises were conducted at 9 beneficiary villages to prepare the Social maps, Resource maps and Seasonal calendars of bioresources.

- Biodiversity Conservation action through community participation – One Ecotourism management committee was formed at Tarini Reang para and for the promotion of Ecotourism in the village one Ecohut constructed at their common land as an option for alternative livelihood. One (01) Website, one (01) mobile app, one (01) Facebook page and one (01) YouTube channel was created for spreading awareness among the societies about the sustainable use of natural resources and to advertise and promote the homestay based ecotourism model as maintained and managed by the local communities. These platforms were also created to facilitate the online pre-bookings of tour packages offered by them.

3.12 Establishing New Database/Appending new data over the Baseline Data

The database available on this regard is specific to study area of the project. Due to the non-availability of previous research in our study site almost all the information availed in this research is a new addition to the baseline database. List of different taxa/group generated through our research is listed below:

ADDITION OF HERB SPECIES TO BASELINE DATA

SN	Name	Family
1	*Thunbergia grandiflora* Roxb.	Acanthaceae
2	*Achyranthes aspera* L.	Amaranthaceae
3	*Amaranthus spinosus*	Amaranthaceae
4	*Chenopodium album* L.	Amaranthaceae
5	*Centilla asiatica*	Apiaceae
6	*Hydrocotyle sibthorpioides* Lam.	Apiaceae
7	*Rauwolfia serpentina*	Apocynacae
8	*Alocasia indica*	Araceae
9	*Colacasia esculenta*	Araceae
10	*Acmella oleracea* L	Asteraceae
11	*Blumea lanceolaria*	Asteraceae
12	*Mikania scandens*	Asteraceae
13	*Parthenium hysterophorus*	Asteraceae
14	*Spilanthes paniculata*	Asteraceae
15	*Spilanthes radicans*	Asteraceae
16	*Synedrella nodiflora* (l.) gaertn	Asteraceae
17	*Diplazium esculentum* Roxb.	Athyriaceae
18	*Buddleja asiatica* Lour.	Buddlejaceae
19	*Commelina paludosa*	Commelinaceae
20	*Floscopa scandens*	Convolvulaceae
21	*Cuscuta reflexa*	Convolvulaceae
22	*Evolvulus nummularius*	Convolvulaceae
23	*Ipomoea carnea*	Convolvulaceae
24	*Ipomoea heterotricha*	Convolvulaceae
25	*Lepistemon binectariferum* (Wall.) O. Kuntze var.	Convolvulaceae
26	*Merremia vitifolia* (Burm.f.)	Convolvulaceae
27	*Costus speciosus*	Costaceae
28	*Kalanchoe pinnata* (Lam.) Pers.	Crassulaceae
29	*Thladiantha calcarata* C.B. Clarke	Cucurbitaceae
30	*Cyperus pilosus* Vahl.	Cyperaceae
31	*Fimbristylis aestivalis* Vahl.	Cyperaceae
32	*Hypolytrum nemorum*	Cyperaceae
33	*Dioscorea deltoidea* Wall. ex Griseb	Dioscoreaceae

34	*Dioscorea hamiltonii*	Dioscoreaceae
35	*Dioscorea villosa*	Dioscoreaceae
36	*Dryopteris affinis*	Dryopteridaceae
37	*Polystichum acrostichoides*	Dryopteridaceae
38	*Phyllanthus urinaria* L.	Euphorbiaceae
39	*Mucuna bracteata* DC.	Fabaceae
40	*Pueraria phaseoloides* (Roxb.) Benth.	Fabaceae
41	*Pueraria tuberosa*	Fabaceae
42	*Senna tora*	Fabaceae
43	*Dicranopteris linearis*	Gleicheniaceae
44	*Curculigo latifolia*	Hypoxidaceae
45	*Curculigo recurvata*	Hypoxidaceae
46	*Mesosphaerum suaveolens*	Lamiaceae
47	*Lindernia antipoda*	Linderniaceae
48	*Lycopodium cernuum*	Lycopodiaceae
49	*Lygodium flexuosum*	Lygodiaceae
50	*Lygodium scandens*	Lygodiaceae
51	*Ammania baccifera* L.	Lythraceae
52	*Melochia corchorifolia*	Malvaceae
53	*Sida acuta*	Malvaceae
54	*Phrynium pubinerve*	Marantaceae
55	*Cyclea barbata Miers.*	Menispermaceae
56	*Musa balbisiana*	Musaceae
57	*Musa paradasiaca*	Musaceae
58	*Boerhavia diffusa* L.	Nyctaginaceae
59	*Ludwigia perennis* L.	Onagraceae
60	*Ludwigia prostrata*	Onagraceae
61	*Dendrobium transparens*	Orchidaceae
62	*Cymbidium aloifolium*	Orchidaceae
63	*Argemone mexicana* L.	Papaveraceae
64	*Peperomia pellucida* (L.) Kunth	Piperaceae
65	*Scoparia dulcis* L.	Plantaginaceae
66	*Arundo donax*	Poaceae
67	*Axonopus compressus* (Sw.) P.Beauv.	Poaceae
68	*Cyrtococcum oxyphyllum*	Poaceae
69	*Imperata cylindrica* (L.) Raeusch.	Poaceae

70	*Paspalum conjugatum*	Poaceae
71	*Thysanolaena latifolia*	Poaceae
72	*Polygonum hydropiper*	Polygonaceae
73	*Rumex maritimus* L.	Polygonaceae
74	*Rumex nepalensis*	Polygonaceae
75	*Drynaria quercifolia*	Polypodiaceae
76	*Spermacoce latifolia* Aubl	Rubiaceae
77	*Mussaenda erosa*	Rubiaceae
78	*Nelsonia canescens* (Lam.) Spreng.	Scrophulariaceae
79	*Physalis minima*	Solanaceae
80	*Stemona tuberosa*	Stemonaceae
81	*Cyclosorus unitus* (L.) Ching	Thelypteridaceae
82	*Boehmeria nivea* Hook. & Arn.	Urticaceae
83	*Stachytarpheta australis*	Verbenaceae
84	*Cayratia trifolia*	Vitaceae
85	*Tetrastigma harmandii*	Vitaceae
86	*Vittaria elongata* Sw.	Vittariaceae
87	*Alpinia malaccensis* (Burm.f.) Rosc.	Zingiberaceae
88	*Curcuma longa* L.	Zingiberaceae
89	*Globba racemosa*	Zingiberaceae
90	*Etlingera linguiformis*	Zingiberaceae
91	*Zingiber chrysanthum*	Zingiberaceae
92	*Zingiber rubens*	Zingiberaceae

ADDITION OF SHRUB SPECIES TO BASELINE DATA

SN	**Name of species**	**Family**
1	*Calotropis gigantea* L.	Apocynaceae
2	*Ervatamia coronaria* (Jacq.) Stapf	Apocynaceae
3	*Chromolaena odorata*	Asteraceae
4	*Meriandra strobilifera*	Asteraceae
5	*Parthenium hysterophorus*	Asteraceae
6	*Combretum indicum*	Combretaceae
7	*Jatropha curcas*	Euphorbiaceae
8	*Manihot esculenta*	Euphorbiaceae
9	*Ricinus communis* L.	Euphorbiaceae

10	*Abrus precatorius* L.	Fabaceae
11	*Cassia occidentalis* L.	Fabaceae
12	*Desmodium velutinum*	Fabaceae
13	*Flemingia strobilifera* R. Br. ex Ait.	Fabaceae
14	*Mezoneuron cucullatum*	Fabaceae
15	*Mimosa himalayana*	Fabaceae
16	*Senna alata*	Fabaceae
17	*Sesbania cannabina* (Retz.) Poir.	Fabaceae
18	*Clerodendrum indicum*	Lamiaceae
19	*Clerodendrum japonicum*	Lamiaceae
20	*Clerodendrum phillippinum*	Lamiaceae
21	*Clerodendrum viscosum*	Lamiaceae
22	*Clerodendrum wallichii*	Lamiaceae
23	*Leea guinensis* G. Don	Leeaceae
24	*Helixanthera parasitica* L. Var.	Loranthaceae
25	*Microcos peniculata*	Malvaceae
26	*Melastoma melabathricum*	Melastomaceae
27	*Osbekia chinensis* L.	Melastomaceae
28	*Maesa indica* (Roxb.) A. DC.	Myrsinaceae
29	*Calamus heteracanthus*	Palmae (Arecaceae)
30	*Calamus leptospadix*	Palmae (Arecaceae)
31	*Ziziphus oenoplia* (L.) Miller.	Rhamnaceae
32	*Chassalia curviflora* (Wall.) Thw. var.	Rubiaceae
33	*Coffea benghalensis* Heyne ex Roem. & Schult.	Rubiaceae
34	*Citrus limon* L.	Rutaceae
35	*Micromelum integerrimum*	Rutaceae
36	*Byttneria pilosa* Roxb	Sterculiaceae
37	*Sarcochlamys pulcherrima* (Roxb.) Gaud.	Urticaceae
38	*Lantana camara*	Verbenaceae

ADDITION OF TREE SPECIES TO BASELINE DATA

SN	Name of species	Family
1	*Alangium chinense* (Lour.) Rehder	Alangiaceae
2	*Alstonia scholaris* (L.) R. Br.	Apocynaceae
3	*Holarrhena antidysenterica*	Apocynaceae
4	*Trevesia palmata* (Roxb.) Vis	Araliaceae
5	*Fernandoa adenophylla* (Wall. ex G. Don) van Steenis	Bignoniaceae
6	*Oroxylum indicum* L.	Bignoniaceae
7	*Stereospermum personatum* (Hassk.) Chatterjee	Bignoniaceae
8	*Garuga pinnata* Roxb.	Burseraceae
9	*Protium serratum* (Wall. ex Colebr.) Engl.	Burseraceae
10	*Trema orientalis*	Cannabaceae
11	*Carica papaya* L.	Cariaceae
12	*Terminalia bellirica*	Combretaceae
13	*Dillenia pentagyna*	Dilleniaceae
14	*Antidesma ghaesembilla* Muell. Arg.	Euphorbiaceae
15	*Hevea brasiliensis* Muel Arg.	Euphorbiaceae
16	*Jatropha carcus*	Euphorbiaceae
17	*Macaranga denticulata* (Blume) Muell.-Arg	Euphorbiaceae
18	*Macaranga peltata* Roxb. Mueller.	Euphorbiaceae
19	*Mallotus tetracoccus* (Roxb.) Kurz	Euphorbiaceae
20	*Sapium baccatum* Roxb.	Euphorbiaceae
21	*Securinega virosa* (Roxb. ex Willd.) Baill.	Euphorbiaceae
22	*Albizia chinensis*	Fabaceae
23	*Albizia procera*	Fabaceae
24	*Albizia lebbek*	Fabaceae
25	*Delonix regia*	Fabaceae
26	*Erythrina fusca*	Fabaceae
27	*Parkia speciosa*	Fabaceae
28	*Senna siamea*	Fabaceae
29	*Gmelina arborea*	Lamiaceae
30	*Careya arborea*	Lecythidaceae
31	*Lagerstroemia microcarpa*	Lythraceae

32	*Lagerstroemia parviflora* Roxb.	Lythraceae
33	*Firmiana colorata* Roxb.	Meliaceae
34	*Pterospermum acerifolium* Wild.	Malvaceae
35	*Toona ciliata*	Meliaceae
36	*Artocarpus heterophyllus*	Moraceae
37	*Artocarpus lacucha*	Moraceae
38	*Ficus auriculata*	Moraceae
39	*Ficus benghalensis*	Moraceae
40	*Ficus racemosa*	Moraceae
41	*Ficus semicordata*	Moraceae
42	*Streblus asper* Lour	Moraceae
43	*Callistemon linearis* DC.	Myrtaceae
44	*Psidium guajava*	Myrtaceae
45	*Syzygium cuminii*	Myrtaceae
46	*Phyllanthus emblica* L.	Phyllanthaceae
47	*Mitragyna tubulosa*	Rubiaceae
48	*Citrus x sinensis*	Rutaceae
49	*Grewia serrulata* DC.	Tliaceae
50	*Callicarpa arborea* Roxb.	Verbenaceae
51	*Vitex altisima*	Verbenaceae

3.13 Generating Model Predictions for different variables (if any)

Through the generation of base maps and baseline information, assessment of biodiversity and bioresource information by quantification and mapping of Dumbur HEP catchment a predictive model of knowledge hub was created. Bioresource associated with different communities viz., Reang, Tripura, Chakma, Jamatia, Molsom etc. were listed out so as to predict their preference in local cuisine.

Sensitization, Skill development workshop and Participatory Rural Appraisal (PRA) has encouraged the participation of women in different activities. This has resulted in the preparation of social maps, resource maps, seasonal calendar etc. Therefore, it can be concluded that social awareness can change the attitude of the people.

Homestay based ecotourism which has been developed by local community with support from the project is a new idea to the study site having a huge potential for sustenance of the rural livelihood as it associates other small-scale industries such as handicraft, weaving, farming, fishery,

poultry, piggery, travel agency etc. Thus, this model can be predicted as a method of sustainable development by replicating the ecotourism facility in other part of the study site.

3.14 Technological Intervention

N/A

3.15 On field Demonstration and Value-addition of Products

- Traditional food or local dishes served for tourists have huge diversity as different community have their own way of preparing their cuisine. These diverse ethnicities will be demonstrated to tourists and information on their importance, utility and nutritional value will be circulated and thereby attract many more.
- Through value-addition and proper market channel the indigenous items of these communities will have the chance to be exposed to the markets worldwide.
- The importance of locally available bioresources were being demonstrated to the communities through the screening of documentary videos, distribution of self-prepared leaflets and pamphlets so as to sensitize and aware the current environmental crisis to spark the innovative mindset and ideas for enhancing rural livelihoods.
- Any visitor or tourist can upload their photos and share their experiences in the website after creating a user ID and password in visitor's section. This way local resource gets highlighted more easily by the practice of citizen's charter by the visiting tourists and even the educated locals.

3.16 Promoting Entrepreneurship in IHR

Skill development and capacity building training was organized for the stakeholders to continuously disseminate the knowledge and technology available for being taken up by the community. The Homestay facility created by the support provided from the project has made prospective entrepreneurs to promote and practice ecotourism for the benefit of specific community as well as developing the ecotourism industry to generate resources and infrastructure by linking associated industries such as, handicraft, weaving, travel agency, hospitality, agriculture, fishery, poultry etc. which has helped in generating diverse livelihood opportunities.

3.17 Developing Green Skills in IHR

Under this project several activities such as, Sensitization programme, Screening of documentary videos, in beneficiary villages and schools, Household questionnaire survey, Bioresource market survey, PRA exercise at beneficiary villages, capacity building trainings etc. conducted to take up the Ecotourism initiatives by the beneficiaries were all focused for developing Green Skills. Beneficiaries of the project

are both male and female who have been given special training on their role in upgrading and sustaining homestay-based ecotourism. Most of the employment that will be generated from ecotourism in future will be green jobs.

3.18 Addressing Cross-cutting Issues

- The project emphasized on conserving available bioresources by providing alternative livelihood option so as to minimize the excessive extraction of natural bioresources.
- Gender equality was one of the major concerns of this project. Though most of the northeast women engage themselves in agriculture activities having a major role than men but in many other areas they are far behind men. To overcome this, entrepreneurship development was concentrated among the perspective women's.
- In this project individual or a single person was not concentrated rather whole family including the women and youths were concentrated.
- Ecotourism management committee was formed involving the whole community of a particular location so as to bring unity and social harmony.
- Through interaction between project staff and the beneficiaries a network of sharing knowledge and information was created.

6 PROJECT'S IMPACTS IN IHR

6.1 Socio-Economic Development

- This project has addressed the issues of livelihood and socio-economic development of the indigenous local communities.
- Different types of bioresources available to the local communities either in the form of cultivation in Jhum and Home-garden or in the form of bioresources collected from forests are both either utilized locally or sold in the nearby markets. The details about their importance, uses and value were listed out so that maximum possible alternative way for proper utilization can be made.
- Personality development and skill development training was conducted in the beneficiary villages to encourage them to take up self-entrepreneurship with their potential resources and skills.
- Community involvement including women in social mapping, resource mapping, preparation of seasonal calendar etc. has increased the confidence of individuals to participate in various activities.
- A homestay based ecotourism activities was started by the local communities with support from project which is a new model that is the life changing alternative livelihood option for every single entrepreneur engaged with them such as handicraft, weaving, carpentry, farming, poultry, piggery, fishery, travel agency etc.
- Improvement of health and nutrition of indigenous communities through sensitization and awareness programme.

6.2 Scientific Management of Natural Resources In IHR

- The natural resources of the region provide life supporting, provisioning, regulating and cultural ecosystem services to thousands of local communities as well as the people from nearby areas.
- This project has given stress to the reduction of the excessive collection of bioresources by forest dwelling local communities from the forest areas by providing an alternative way of livelihood generation through homestay-based ecotourism activities.
- Many underutilized but important bioresources were identified to encourage the communities so as to grow in the nearby kitchen garden or in the periphery of village boundaries.

6.3 Conservation of Biodiversity in IHR

- List of bioresources collected by villagers from forest areas, marketed bioresources, cultivated bioresources in Jhum field or in kitchen garden for the sustenance of livelihood were all listed out. Further, their utility, parts of the resource used and mode of use were all categorized.

- In the assessment of natural bioresources through Transect and quadrat based sampling it was found that some of the species which was once frequently available was seen to be very rare or even extinct in nature. Therefore, cultivation of such species were encouraged among the locals.

- Guide training for bird watching, ecosystem monitoring and narration were given to the potential youths of the local communities.

6.4 Protection of Environment

- The main focus of this project is to conserve the biodiversity and protect the environment by involving communities through livelihood generation and awareness using the potentiality of the natural environment in the form of tourism.

- The study also highlighted the impact of small HEPs of lower elevation submerging large areas to the adjoining vegetation including all life forms, their diversity and distribution pattern etc.

6.5 Developing Mountain Infrastructures

- By the support from this project an Ecohut was built in one location by the local community to carry out Ecotourism activities as an alternative means of enhancement of local economy which has reduced the pressure of anthropogenic activities on the forest lands. For better functioning of the activities an Ecotourism management committee was formed consisting of different sub-committees.

6.6 Strengthening Networking in IHR

- Tripura is on its way to become the gateway of northeast India from all the southeast Asian countries by means of water ways through Chittagong port. This type of ecotourism initiative if replicated to the other areas will have huge importance to uplift the local economy as well as by bringing the foreign currency and ultimately will become one of the major tourist destination hub in the entire country.

7 EXIT STRATEGY AND SUSTAINABILITY

7.1 How effectively the project findings could be utilized for the sustainable development of IHR

This project falls under two of the five areas of sustainable development of Indian Himalayan Region (IHR) addressed by NITI Aayog (2018) which are- 1) skill and entrepreneurship development and 3) Sustainable tourism. The project intervention directly supported the enhancement of livelihood and biodiversity conservation through awareness talks, screening of documentaries, skill development trainings etc. and thereby established an ecotourism management committee to carry out ecotourism activities using the flow of ecosystem services. Activities of this project comprises of components related to community empowerment by capacity-building of the target community. The project has resulted in empowering the ethnic community by providing a new means for livelihood through ecotourism and its associated activities. Enrichment plantation of important underutilized fruit crops and agroforestry activities will meet their domestic needs as well as reduce pressure on the nearby protected forest areas.

7.2 Efficient ways to replicate the outcomes of the project in other parts of IHR

The infrastructure developed through this project need to be scaled up and replicated by linking different communities or stakeholders in the network. For the quality improvement the stakeholders can imitate some success stories or visit the areas of successful case studies in ecotourism. As ecotourism is one of the most effective ways to utilize ecosystem services giving no harm to both environment and traveler it can easily be disseminated to anywhere by improving the quality of ecosystem services of that specific area.

7.3 Identify other important areas not covered under this study needs further attention

Study on ecosystem services of entire Dumbur reservoir was limited as complete estimation of different ecosystem services was not valued which by adding such values can make the reservoir more efficient. Study on different bioresources used by different communities, their utility, parts used, mode of use etc. was conducted in this study but culture and tradition based anthropological studies can also be done to know their ethnicity more closely. Studies on aquatic resources were also limited as this project has included only fishes, prawns, crabs and some mollusks and there can be a need to explore the diverse aquatic resources.

7.4 Major recommendations for sustaining the outcome of the projects in future

- Permanent structure for eco-hut facility can be provided to the community through different govt. schemes. To reduce the anthropogenic pressure on natural forest areas ecotourism and its

associated industries such as handicraft, weaving, poultry, piggery, fishery, farming etc. can also be developed by providing infrastructural supports and value additions.

- The facility of Homestay can be persuaded to be taken up by other predominant communities of the region so that it can boast the economy and social well-being of the people.
- Livelihood options are quite limited in this region and ecotourism should be promoted with developing the cultural heritage, art and artifacts etc. so that it catches the eyes of the outside world with promotion of multiple stakeholders.
- Road connectivity in most of the villages including Raishyabari which is a rural development block under Gandachara sub-division needs to be improved.
- Lack of frequent electricity with sufficient voltages is one of the major disadvantages in most of the areas of the study site.
- As Dumbur area is one of the most potential areas of ecotourism in the state, government should create a network for livelihood opportunities by developing infrastructures, connecting proper roads and electricity.
- Moreover, people should have a social mindset of entrepreneur so that they may see the scope and opportunities for ecotourism in a broader prospect.

8 REFERENCES/ BIBLIOGRAPHY

9 ACKNOWLEDGEMENT

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APPENDICES

Appendix 1 – Details of Technical Activities

Appendix 2 – Copies of Publications duly Acknowledging the Grant/ Fund Support of NMHS

Appendix 3 – List of Trainings/ Workshops/ Seminars with details of trained resources and dissemination material and Proceedings

Appendix 4 – List of New Products (utilizing the local produce like NTFPs, wild edibles, bamboo, etc.)

Appendix 5 – Copies of the Manual of Standard Operating Procedures (SOPs) developed

Appendix 6 – Details of Technology Developed/ Patents filled

Appendix 7 – Any other (specify)

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Appendix 1

Table-1A DETAILS OF TECHNICAL ACTIVITIES

Activity	Methodology	Focus Area of Action	Activity performed	Key beneficiaries
Biodiversity survey	Grid and transect based survey for different taxonomic group: Quadrat and transect based survey for Plant Resources (Trees, Shrubs, Herbs) 10% of the area around the lake will be assessed	Biodiversity assessment, Knowledge on NTFP's, threat estimation, and Ecological diversity	Checklist, Pictorial Database, Diversity Indices	Local inhabitants, Central and State Government both; Educational Institutions, Ministry of Rural Development; Ministry of Environment, Forests & CC;
Sensitisation programme	PRA, Screening of documentary, Distribution of pamphlets etc., Hands on training for monitoring of biodiversity components, Popular Talks in schools, panchayat bhawan etc. 10 Villages will be sensitized	Documentation for general awareness and extension activities	Change in attitude- to be monitored through yearly survey	Ecosystem components, Entry point activities, PRI, Forest Department, Protected Area Management
Entrepreneurship development	Snow ball sampling, PRA exercise, identification of potential houses for developing home stay facility and modification of existing facility for ecotourism. Training the potential family member preferably women. Ecotourism facility will be developed in two locations around Dumbur	Livelihood enhancement	Number of entrepreneur involved in Ecotourism initiatives, Volunteers turn up	Forest department, Tourism Department, Rural Development Department
Skill development	Identification of educated youths preferably persons with multiple language skills. Guide training for bird watching, ecosystem monitoring and narration etc. At least 10 Educated unemployed youth will be trained	Human Resource Development	Regular Feedback from tourists and other user agencies	Forest department, Tourism Department, Rural Development Department
Community involvement with Govt. dept.	Forming ecotourism management committee with different stakeholders. One Ecotourism management Committee	Community participation	Number of conflicting cases in implementation of different Government projects in the area.	Forest department, Tourism Department, Rural Development Department
Conservation initiative	Indicator species identification after analysing data collected on biodiversity components.	Genetic Resource Conservation	Conservation status of indicator species, Ecosystem health	Forest department, Tourism Department, Rural Development Department
Report Writing	Database creation, analysis, expert opinion, stake holder consultation	Reporting in time	Final Report	Forest department, Tourism Department, Rural Development Department

Table-1B Details of Field Survey arranged

Date	Purpose
April 2018	Stakeholders Consultation- Local communities, JUST
August 2018	Stakeholders Consultation- Local communities, JUST
September 2018	Market survey of Bioresources
October 2018	Field visits for documentation of flora available in Jhum area.
December 2018	Selection of sites/villages and families for conducting PRA Exercise and for support of homestay, respectively
February & March 2019	Establishment of Field Basecamp Rapport building at the villages viz. Tarini para, Niruha Chowdhury Para from Pancharatan VC, Mohanta para, Ramnagar Bazar, Dhanbabu para, Jibakarta para and Manubhakta para from Ramnagar VC, Monadhan para and Rupadhan para from Rani pukur VC, Sambhajoy para from Chitrajhari VC, Tribagya para from Kalajhari VC Mandul para from Dhalajhari, Jagabandu and Raishyabari Questionnaire survey was carried out at villages viz. Tarini para, Rupadhan Chakma para and Tribaigya para. Traders interview/market survey Awareness program was organised at Manubakta para and Tarini para. Screening of documentaries in the villages for awareness campaign and to focus attention on attitudinal change of the villagers
June & July 2019	Transect and Quadrat based survey Identification of beneficiaries for the establishment of ecohut Identification of educated youth
February 2020	Popular talks and the screening of documentary Awareness programmes and Distribution of Leaflets & Pamphlets
March 2020	Identification of potential youth and formation of an Ecotourism management committee Market survey for Bioresource

November & December 2020	Market survey of bioresource at Jagabandhu Bazar, Ramnagar Bazar, Gandachara Bazar and Narayanpur Bazar etc. Meetings with beneficiaries for establishment of Eco-hut, registration of society and for conducting Entrepreneurship & Skill development training at Monafa, Ranjit Roaja Para, Tarini Para and RaS Noadhan Roaja Para. "One day training cum workshop on Community based Forest Management & Ecotourism as alternative livelihood option" programme was organised on 12th December 2020.
January, February and March 2021	Questionnaire survey was carried out at Manubakta para, Chaplingchara, Gudhamjoy para, Charanda Roaja Para, Ranjit roaja para, Bhakta para etc. PRA Exercise were Conducted at 9 different locations viz. Chaplingchara, Charanda Roaja Para, Monafa, RaS Noadhan Para, Gudhamjoy Para, Tarini Para, Bhakta Para, Monmohan Para and Dhanbabu Para. Social map, Resource map and Seasonal calendar were prepared through their participation. Transect and quadrat-based survey carried out for Biodiversity assessment.

Table-2 Demonstrative Skill Development and Capacity Building/ Manpower Trained

S. No.	Type of Activities	Details with number	Activity Intended for	Participants/Trained			
				SC	**ST**	**Woman**	**Total**
1.	Workshops	**01**	**Livelihood option**	**Nil**	**60**	**23**	**60**
2.	On Field Trainings	**09**	**PRA Exercise**	**Nil**	**124**	**36**	**124**
3.	Skill Development	**01**	**Livelihood option**	**Nil**	**60**	**23**	**60**
4.	Academic Supports	**02**	**Sensitization Programme**	**Nil**	**160**	**84**	**180**
5.	Others (if any) Professional training of Forest officials	**02**	**Training to the Field Staff of Gumti Wildlife Sanctuary** **Wildlife Census of Gumti Wildlife Sanctuary**				**20** **30**
			Total		**404**	**166**	**474**

Table-3 Technological Intervention

S. No.	Type of Intervention	Brief Narration on the interventions	Unit Details (No. of villagers benefited / Area Developed)
1.	Development and deployment of indigenous technology	One traditional Eco-hut was constructed for the promotion of livelihood avenues through Ecotourism.	43 people benefited. One area developed.
2.	Diffusion of High-end Technology in the region	Workshop, Sensitization, Awareness and PRA was conducted to introduce Ecotourism and sustainable use of resources. It will reduce the pressure in the protected area and improve conservation of biodiversity through people's participation.	350 people were sensitized through different awareness programme. 60 people were given skill development and entrepreneurship training
3.	Induction of New Technology in the region	Concept of Ecotourism and Homestay is completely a new idea of income generation for the region. Replicable ecotourism model can enhance the local economy.	43 people benefited. One area developed.
4.	Publication of Technological / Process Manuals	One Pocket Travel Guide. Production of a leaflet called "Conservation of potential bioresources". It is further translated to Kokborok and Bengali for distribution. Publication of a Pamphlets called "Conservation Tourism". It is further translated to Kokborok and Bengali for distribution.	One pocket travel guide book 3 Leaflets 3 Pamphlets
	Others (if any)		

Appendix 2

LIST OF FIGURES (Publication and Publicity materials)

Fig 1: A Paper published on 11th Convention Planner 2018 by Tripura University on 15-17 November, 2018

PLANNER 2018

Prospects of Forest Based Ecotourism for Conservation of Biodiversity in Tripura

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Dept. of Forestry and Biodiversity,
Tripura University

Forest resources in Tripura are rich in its bioresources and possesses enormous diversity. In Tripura two third (> 60%) of the geographical area are covered by forests. The majority of the forests belong to East Himalayan Moist Mixed deciduous (39 %) & Low Alluvial Savannah Woodland (43%) with some area under Cachar Tropical Semi-evergreen (3%); Secondary Moist Bamboo Brakes (8.5%) & East Himalayan Lower Bhabar Sal (4%). The forests have high degree of endemism and genetic diversity by possessing rich species diversity. Tripura's forests are rich in its plant and animal life with 379 tree species, 320 shrubs, 581 herbs, 165 climbers, 16 climbing shrubs, 35 ferns, and 45 epiphytes registered so far (Kshirsagar and Upadhaya, 2009; Sharma et al., 2013) and 1708 species of animals belonging to 1042 genera with 536 species of Insects in 346 genera; 259 species birds in 157 genera and 474 vertebrate fauna species under 301 genera (ZSI, 2002).

The state of Tripura is inhabited by 19 tribes, namely Jamatia, Chakma, Halam, Kuki, Chaimal, Uchoi, Magh, Garo, Lushai, Bhutia, Lepcha, Bhil, Munda, Oraon, Mog, Santhal, Murasing, Reang and Tripuri. Most of these tribal communities live in and around dense forests, and have maintained their own culture, language, food habits, and socio religious traditions (Deb et al., 2013, Sharma et al. 2013). Most of the tribal economies are engaged in subsistence agriculture and have developed great knowledge on the use of plants and plant production in curing various ailments (Debbarma et al, 2017). The population has a deep belief in their native folklore medicine for remedies. Among the communities in Tripura each community has their unique socio-cultural heritage, language, food habits (Majumdar and Datta, 2007).

Tripura has five parallel hill ranges which viz. Baramura-Deotamura, Atharamura, Jampui, Langtarai and the Sakhantlang. These hill ranges are mostly clothed with the dense forest of mixed deciduous and evergreen forests housing some of the important trees like Dipterocarpus, Artocarpus, Amoora, Elaeocarpus, Syzygium, Eugenia which dominate the top canopy. Large tract of land in forest area show bamboo forest, often interrupted by evergreen or deciduous secondary stand. Cane grows extensively in the wet hollows and amidst evergreen, semi-evergreen and moist deciduous forest. Species of Calamus (guruba, floribundus, ertectus, leptospadix, vimnialis) dominate the thorny thickets. The hill ranges form the watershed for the 10 major rivers like Deo, Dhalai, Fenny, Gumti, Haora, Juri, Khowai, Langai, Manu and Muhuri which originate from these hill ranges and are the lifeline for the state. The areas lying in between the hill ranges forms the productive valleys which mostly from the habitational areas. Tripura also houses a considerable swamp areas and harbour harbaceous species, few shrubs and trees dominated by Albizia, Baringtonia, Lagerstroemia, Macaranga, Mallotus species; herbs and grasses. This shows that the landscape is quite diverse and unique to attract and support tourism. Natural landscape of

त्रिपुरा विश्वविद्यालय
Tripura University
(A Central University)
Suryamaninagar, Tripura (W)

Fig 2: A Paper published on National Workshop on River and Water Management for Sustainable Development with Policy perspectives organized by Tripura University on July 3rd and 4th 2019.

Understanding Community structure and resource dependency to Strategize Conservation based Ecotourism for sustainable management of Dumbur Reservoir-A proposed Ramsar site.

Thiru Selvan, Sabyasachi Dasgupta, Francis H Darlong and Divya R,

Abstract

Gumti basin in Tripura, India has led to widespread dispossession, loss of land, extinction of flora and fauna, and demographic impacts on indigenous peoples. The nearby villages constituting the tribal communities are dependent on the nearby forests including the Gumati Wildlife Sanctuary for their livelihood and basic needs. There is an urgent need to conserve the forest while using its components sustainably. The present study was initiated in 14 villages in and around the Dumbur reservoir to understand the community dependency on the lake and adjoining areas and identify the stake holders to initiate ecotourism activities. It is noticed that the area is dominated by tribal communities comprising of Tripura, Reang, Chakma, Jamatia and Molsom-kuki-Marak. Community dependency was noticed to be only on fishing and with very less Jhum cultivation during the recent years. Alternative sources of livelihood have to be taken care of in these areas so as to promote the socio-economic status of the villagers. The ethnicity of communities and availability of rich biodiversity resources has to be mobilised to focus on promoting conservation. Ecotourism can provide the best possible options to conservation of the rich biodiversity by contributing to the socio-economic wellbeing of the ethnic communities. Looking into the community structure, land use pattern and dependency, the stakeholders to ecotourism can be in villages, Ranipukur, Ramnagar, Pachim Potachhara and Paschim raima with their respective dominant ethnic community and suitability of the area.

Keywords: Ecotourism; Community based Conservation; Gumati River; Sustainable Development

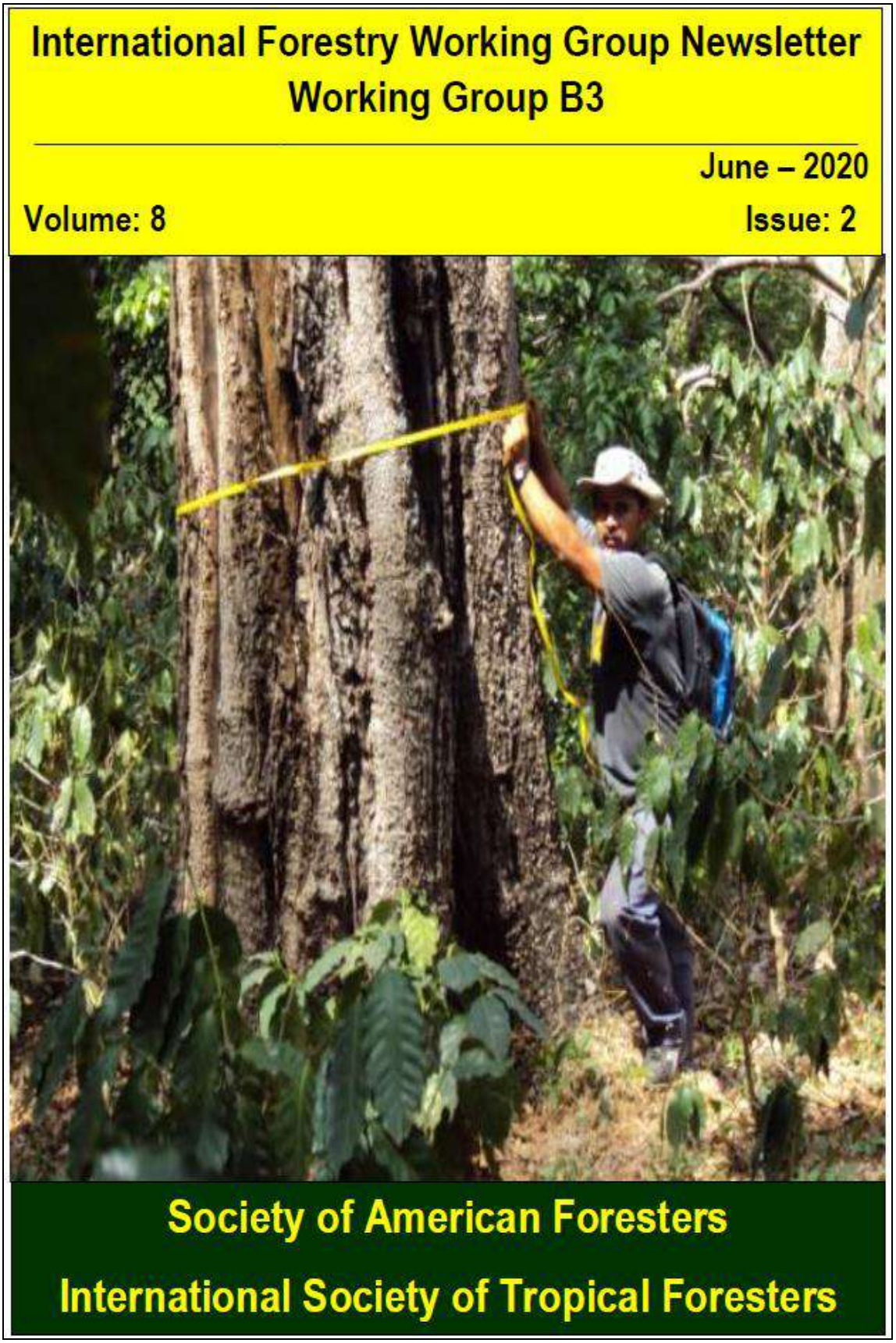
Introduction:

Forests and the adjoining areas surrounding human habitation that supports resources with numerous species and vegetation types are important in the livelihoods of the local people as they depend on forests resources for various products such as fuel wood, construction materials, medicine, and food. Customary forest dwellers and indigenous peoples may define and interpret their environment differently across regions, cultures and generations. Globally, it is estimated that between 1.095 billion and 1.745 billion people depend to varying degrees on forests for their livelihoods and about 200 million indigenous communities are almost fully dependent on forests (Chao, 2012). The same is true with regards to the most of the forest areas in India as well and Tripura in particular where indigenous communities are dependent on them for their livelihood and economy. It is estimated that 20–25% of rural peoples' income is obtained from environmental resources in developing countries (Chao, 2012).

Forests also have a customary and spiritual meaning as a source of livelihood, cultural significance and individual and collective identification (Chao, 2012). Resource users become dependent on certain resources because of their level of attachment to the resource to which they have become accustomed or they have been making use of the resources for their own existence. There have also been community attachment to the resources and each community has promoted the use of certain resource in their own areas or made a part of their CPR which they felt is supreme. Some of the Local people have also adapted to certain occupation based on these resources and has led to great pressure on the limited forest resources. Forest degradation, resource depletion, loss of biodiversity, and resilience in ecosystems has become the major environmental issues.

The Gumti basin is situated in the lower middle part of Tripura. Gumti is the major river of Tripura. The Gumti river and the reservoir created by the Dumboor dam with coverage of approximately 300 kms are surrounded by lush landscape. HEP had submerged about 40 Sq. Km. of land in the year 1976 displacing about 27,000 indigenous farmers. Thousands of tribal people were displaced due to

Fig.3 A published Newsletter from the Project (A-B)



(A)

Conservation based Ecotourism Through Community Participation - A case from Tripura India

ThiruSelvan, Sabyasachi Dasgupta and Kiran Kumar Murasing

Department of Forestry and Biodiversity
Tripura University, Suryamaninagar, Tripura, INDIA-799022

A project entitled "Conservation of Biodiversity and livelihood enhancement through Community based Forest Management and Ecotourism in and around submergence of Small Hydropower project" is being implemented by the Tripura University, Agartala in partnership with Jana UnnayanSamiti Tripura a Social development wing of the Diocese of Agartala and funded by National Mission on Himalayan Studies, implemented by Ministry of Environment, Forest and Climate Change, Nodal and Serving hub with G.B. Pant "National Institute of Himalayan Environment"Kosi-Katarmal, Almora, Uttarakhand. Under this efforts were initiated by the principal author who is the Principal Investigator of the project around Dumburreservoir, Tripura to promote Conservation based Ecotourism through Community participation so that the Livelihood of the people living around this area can be enhanced.

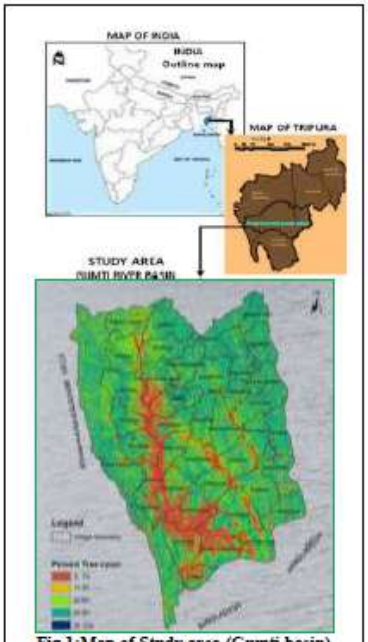


Fig 1:Map of Study area (Gumti basin)

The creation of Dumbur Hydro Electric Project (15 MW) on the river Gomati at Dumboor falls, Tripura, has submerged about 40 Sq. Km. of land in the year 1976 displacing about 27,000 indigenous farmers. This submerged area in due course of time has become a biodiversity rich wetland.But the displaced farmershad to move towards the nearby hills and settled there giving pressure to the forest and forest resources. Due to the lack of other livelihood options they are now overexploiting the existing resources with no control. Some of them even practise slash and burn agriculture on a large scale which is devastating the large stretches of forest (Fig. 3). Part of the study area which falls under the Gumti Wildlife Sanctuary is also facing threat. It is where the concept of Ecotourism originated through community participation so that the indigenous communities living around the reservoir find new way for livelihood option due to the potentiality of this region (Fig. 2).

(B)

Fig 4: Leaflet written in English for distribution

Fig 5: Leaflet Translated in Kokborok for distribution.

Fig 6: Leaflet Translated in Bengali

Fig 7: Pamphlet prepared in English (A-B Page 1 &2)

(A)


Conservation Tourism
with special focus on Gumti Basin, Tripura
ECO-TOURISM AND SOCIO-ECONOMIC-ECOLOGICAL SUSTAINABILITY
COMMUNITY BASED ECO-TOURISM
• Involving residents into ecotourism, can help local people meet their economic needs, by maintaining and enhancing the "sense of place" for long-term conservation.
• Uplift the standard of local people by involving them as guide for Bird watching, Ecosystem monitoring and narration etc.
SUSTAINABLE TOURISM
Tourism that will not reduce the availability of resources and does not inhibit future travelers from enjoying the same experience.
LOW VOLUME HIGH VALUE AND LOW IMPACT TOURISM
SUSTAINABLE DEVELOPMENT GOALS
Socio-Economic-Ecological Sustainability
ECO-TOURISM FOR CONSERVATION
• Helps in protections of ecologically sensitive locations.
• Generates income and livelihood options for the local people.
• Creates awareness to conserve and protect environment.
• Helps to get closer to the nature's beauty.
• Awareness to protect endangered species.
ECO-TOURISM AND CULTURE
• Ecotourism adds value to cultural traditions and practices.
• Eco-tourism offers incentives to keep tradition alive and to preserve the heritage of culture, village for ecotourists who are willing to pay to learn and appreciate such things.
• Ecotourism promotes belief systems and tries to acknowledge conservation initiatives.
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© Department of Forestry and Biodiversity, Tripura University, Agartala, INDIA
For more details contact:
Dr Thiru Selvan or Dr Sabyasachi Dasgupta,
Department of Forestry and Biodiversity
log on to: conservationtourism.in
E-Mail: tconservationtourism@gmail.com

(B)

Fig 8: Pamphlet Translated in Kokborok (C-D Page 1 & 2)

(C)


Conservation Tourism
Tourism ni bisingtwi Soi khatimung
Panjalwi naharmwng- Gumoti twi-yaphang no rekewi
ECO-TOURISM TAI SOCIO-ECONOMIC-ECOLOGICAL SUSTAINABILITY
DOPHAROKNI BISINGTWI ECO-TOURISM
• Noknukhungno Ecotourism bai kwrungrowi rangkhok puicha ajithani chugwi mano tai kuduk khatimungni bagwi Noknukhungno soi khe naikini khlaima bai twitherna nangnai.
• Toksatoktwi naimung, Ecosystemno soi khe twithermung tai kothoma sawi khnarwmani rogo kwrwng rwmani bisingtwi ganao tongnai bororokni noknukhungno saka kasarwmano.
TONGKUSUNGNI TOURISM
Omohai Tourism o nangma manwi tongmarok komorwi thanglak taibo se thinango naina bagwi phainai bororokbo a manwirokno nugwi mannai.
CHIKON PHIYA NANGKUKMANI TAI KEBENGTHAYA ABOHAI TOURISM
SUSTAINABLE DEVELOPMENT GOALS
Socio-Economic-Ecological Sustainability
KHATIMUNG NI BAGWI ECO-TOURISM
• Ecologically sensitive jagathai rokno katirwthani chugo.
• Ganani bororokni bagwi ajinani tei thangwi tongnani lama snamwi rwo.
• Environment no hamya wngnani katithani tei khatiwi tonnani sicharwo.
• Hayungni naithok nukthok bai kwrwng rwo.
• Komortwtwi projatirokno khatinani phrwngwi sicharwo.
ECO-TOURISM BAI HUKUMU
• Agini hukumu tai khlaimung rokno tor-rwthani tai rak rwthani Ecotourism chugo.
• Eco-tourism ni bisingtwi agini khlaimungrokno kwthang tonthani tai yaphangni hukumu rokno kwmayatwi khe tonthani chubachu mano.
• Dopharokni poito khlaimungrokno pirthani tai bohrok khatimungni bagwi saktharmani kokno Ecotourism pirwi buino bo khnarwo.
Kok slainai: Mr Kiran Kr. Murasing, JPF, NMHS Project
Paithago check tai verify khlai kha: Dr. Samir Debbarma & Dr. Biman Debbarma, Department of Kokborok, Tripura University
O bwlai phunukthani Rang-puisa o chubanai wngkha National Mission on Himalayan Studies (NMHS), GBPNIHESD, Almora, U.K., INDIA
© Department of Forestry and Biodiversity, Tripura University, Agartala, INDIA
Teibo kwbang sainanna bagwi kwrwngdi: Dr Thiru Selvan eba Dr Sabyasachi Dasgupta no, Department of Forestry and Biodiversity
log in khlaidi: conservationtourism.in
E-Mail: tconservationtourism@gmail.com

(D)

Fig 9: Pamphlet Translated in Bengali (E-F Page 1 & 2)

(E)


Conservation Tourism
সংরক্ষণ জনিত পর্যটন
বিশেষ দৃষ্টিআরুপ ত্রিপুরার গোমতী অববাহিকার উপর
পরিবেশ-পর্যটন এবং আর্থ-সামাজিক-বাস্তুতান্ত্রিক স্থিতিশীলতা
সম্প্রদায় ভিত্তিক পরিবেশ-পর্যটন
অধিবাসীদের পরিবেশ-পর্যটনের সঙ্গে যুক্ত করে দীর্ঘমেয়াদী সংরক্ষণের জন্য জায়গাটির নিজস্বতা ও উন্নতির কারণসরূপ স্থানীয় লোকদের অর্থনৈতিক চাহিদা মেটানোর জন্য সহায়তা করতে হবে।
পাখি পর্যবেক্ষণ, বাস্তুতন্ত্রের তদারকি ও বিবরণ ইত্যাদির জন্য পথ প্রদশক হিসাবে স্থানীয় মানুষকে জড়িত করে তাদের মান উন্নীতে সহায়ক হতে হবে।
স্থিতিশীল পর্যটন
পর্যটন যা সম্পদের প্রাপ্যতা হ্রাস করবে না এবং ভবিষ্যত ভ্রমণকারীদের একই অভিজ্ঞতা উপভোগ করতে বাধা দেবে না।
স্বল্প পরিমাণ, উচ্চ মানসম্পন এবং পর্যটনের উপর কম প্রভাবশীল।
SUSTAINABLE DEVELOPMENT GOALS
আর্থ-সামাজিক-বাস্তুতান্ত্রিক স্থিতিশীলতা
সংরক্ষণের জন্য পরিবেশ-পর্যটন।
পরিবেশগত দিক থেকে সংবেদনশীল অবস্থানগুলির সুরক্ষায় সহায়তা করে।
স্থানীয় জনগণের জন্য আয় ও জীবিকার বিকল্প তৈরি করে।
পরিবেশ সংরক্ষণ ও সুরক্ষায় সচেতনতা সৃষ্টি করে।
প্রকৃতির সৌন্দর্যের আরও কাছে নিয়ে যেতে সহায়তা করে।
বিপন্ন প্রজাতির সুরক্ষার জন্য সচেতন করে।
পরিবেশ-পর্যটন এবং সংস্কৃতি
পরিবেশ-পর্যটন সাংস্কৃতিক ঐতিহ্য এবং অনুশীলনের মান বাড়াতে সহায়তা করে।
পরিবেশ-পর্যটন সংস্কৃতির ঐতিহ্যকে বাঁচিয়ে রাখতে এবং সংরক্ষণের জন্য উৎসাহ দেয়, এবং গ্রামের এই জিনিসগুলি সম্পর্কে জানতে এবং তারিফ করতে অনেক পর্যটকরা অর্থ দিতে আগ্রহী হন।
পরিবেশ-পর্যটন বিশ্বাস ব্যবস্থা প্রচার করে এবং সংরক্ষণের উদ্যোগগুলি স্বীকার করার চেষ্টা করে।
অনুবাদক : প্রসেনজিৎ পাটারী এবং কিরণ কুমার মুড়াসিং
অরণ্যবিদ্যা ও জীববৈচিত্র্য বিভাগ, ত্রিপুরা বিশ্ববিদ্যালয়
এই প্রকাশনার আর্থিক সহায়তায় সাহায্য করেছে ন্যাশনাল মিশন অফ হিমালয়ান স্টাডিজ (এনএমএইচএস), জিবিপিএনআইএইচএসডি, আলমোড়া, উত্তরাখন্ড, ভারত
অরণ্যবিদ্যা ও জীববৈচিত্র্য বিভাগ, ত্রিপুরা বিশ্ববিদ্যালয়, আগরতলা, ভারত
বিস্তারিত জানার জন্য যোগাযোগ করুন:
ডঃ স্বীকৃ সেলবন বা ডঃ সব্যসাচী দাশগুপ্ত,
অরণ্যবিদ্যা ও জীববৈচিত্র্য বিভাগ,
লগইন করুন: conservationtourism.in
ই-মেইল: tconservationtourism@gmail.com

(F)

Appendix 3 (Details of Trainings/ Workshops/ Seminars)

List of participants attended in one day Training Cum Workshop

ONE DAY TRAINING CUM WORKSHOP

Participants Details

Venue – Tarini Reang Para

Date – 12th December 2020

SL. NO	Participants Name	Gender	Age	Occupation	Qualification	Father/Guardian/Husband	Village/Hamlet	Contact No. & Email	Signature
						Braja Ram Tripura	Ranjit Para		
01.	Ranjit Tripura	Male	65	Farmer	Eight			8131078513	Ranjit Tripura
02.	Kali Mohan Tripura	Male	57	Part Time Job	Madhyamik	Hiten Kumar "	"	7629888539	Kali Mohan Tripura
03.	Ranjan mohan "	"	45	Jum Jhumiya	Five	Chamandra "	"	8118903100	
04.	Dhananjoy "	"	35	"	Six	Lalit mohan "	"	9402172861	Dananjoy Tripura
05.	Triupenjit "	20 "	25	Student	B.A	Rohini Kumar "	"	8731831855	Triupenjit Tripura
06.	Bralajoy "	"	32	Jhumiya	Nine	Laxmiohan "	"	6033064194	
07.	Narendra "	"		Student	B.A	Tita mohan "	"	8731034553	Narendra Tripura
08.	Jiku babu "	"	22	Student	Madhyamik	Chandra Kete "	"	8731836787	Jiku baba Tripura
09.	Tayal "	"	29	Job (Part Time)	M.A (B.Ed)	Bajan Kumar "	Maya kumare Para	8131842661	Tayal Tripura
10.	Ajoy "	"	30	Driver	Nine	Materdra "	Dinaram Para	7629890194	AJOY TRIPURA
11.	B. Johana Malsom	"	19	Student	eleven	Japaram Malsom	Monaplur para	9612557361	B. J. Malsom
	~~Jiten Singh Malsom~~	"	~~17~~	"					
12.	Jiten Singh "	"	17	"	Nine	Aiyokha "	"		Jiten Singh Malsom
13.	Malsoma Malsom	"	35	Farmar			"		Malsoma Malsom
14.	Jogsing Reang	"	36	Driver	(+2) passed	Hara Kuma Reang	Tarini Reang para	8131830305	Jogsing Reang
15.	Susmita Reang	female	16	student	class IX	Mistarai Reang	"	NIL	Susmita Reang
16.	Bebulti Reang	"	16	student	class VIII	Khagiram Reang	"	"	Bebulti Reang
17.	Kharcaibti Reang	"	17	Student	X	Aizak rai Reang	"	"	Kharcaibti Reang

(A)

Sl. NO.	Participants Name	Gender	Age	Occupation	Qualification	F/G/H	Village/Hamlet	Contact NO. & Email	Signature
18.	Rebiki Reang	Female	18	Student	X	Suchindra Reang	Tarini para	NIL	Rebiki Reang
19.	Martina Reang	"	16	Student	IX	Jog Sing Reang	"	"	Martina Reang
20.	Tuisukti Reang	"	15	Student	VI	Khargoram Reang	"	"	Tuisukti
21.	Gamael Reang	Male	17	Student	IX	Tustaram Reang	"	"	Gamael Reang
22.	Sandonai Reang	"	25	Driver	XII	Birbasu Reang	"	"	Sandonai Reang
23.	Sithauhrai Reang	"	27	farmer	V	Jayanta Reang	"	7629045084	Sithauhrai Reang
24.	Tasiram Reang	"	36	Farmer	IX	Kushachandra Reang	Biswaremi Para	6033297472	Tasiram Reang
25.	Kherutchandra Reang	"	29	farmer	VI	Kushachandra Reang	"	9436715076	Kherutch. Reang
26.	Jeten Reang	"	26	farmer	VI	Hanojog Reang	Tarini Para	8415081249	Jeten Reang
27.	Koishopa Reang	"	55	farmer	NIL	Chandrana Reang	"	NIL	[illegible]
28.	Ishoram Reang	"	20	Student	X	Mohindra Reang	"	6909723436	Ishoram Reang
29.	Subidra Reang	female	35	House wife	NIL	Babiram Reang	"	8974949309	[illegible]
30.	Sailabati Reang	"	35	Teacher	X	Jarpianrai Reang	"	8131048820	Sailabati Reang
31.	Kumbirung Reang	"	50	House wife	NIL	Bidhojog Reang	"	8974777083	[illegible]
32.	Arunabati Reang	"	55	House wife	NIL	Jaliram Reang	"	"	[illegible]
33.	Tarabati Reang	"	21	House wife	NIL	Kumbaram Reang	"	NIL	[illegible]
34.	Pushauti Reang	"	58	House wife	NIL	Baladar Reang	"	"	[illegible]

(B)

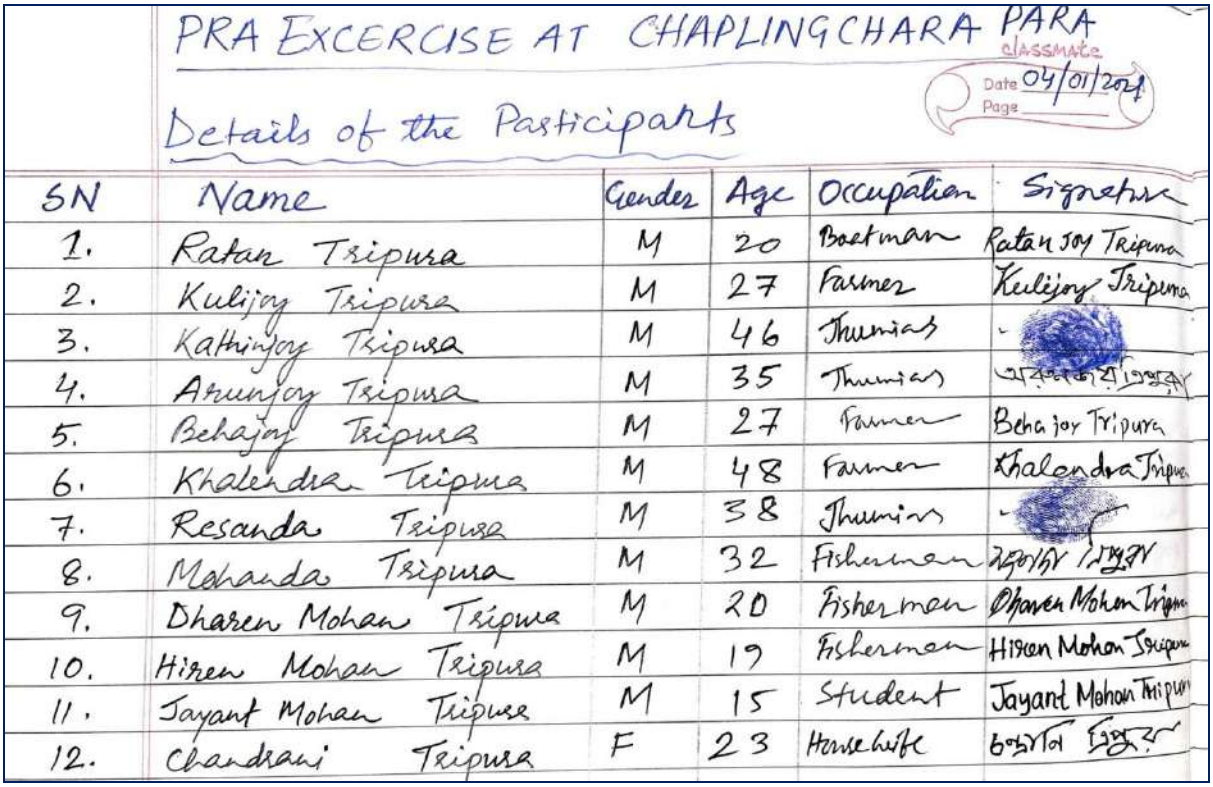
Sl. NO.	Participant's Name	Gender	Age	Occupation	Qualification	Father/Guardian/Husband	Village/Hamlet	Contact & Email	Signature
35.	Bidhadani Reang	Female	29	House wife	VIII	Madhan Reang	Tarini Para	9436304569	
36.	Dailabati Reang	"	26	House wife	NIL	Kolenjoy Reang	"	NIL	
37.	Punthirung Reang	"	28	"	"	Birchandra Reang	"	NIL	
38.	Arungbati Reang	"	37	"	"	Kelasai Reang	"	NIL	
39.	Azakrai Reang	"	29	Driver	V	Phaidoya Reang	"	8974421162	
40.	Kishorai Reang	Male	25	Beker	X	Ranijoy Reang	"		Kishore Rai Reang
41.	Nironjoy Reang	"	24	Beker	IX	Birbashu Reang	"	8105306018 nironjoy143@gmail.com.	
42.	Arnobati Reang	Female	54	House wife	NIL	Bodasing Reang	"		
43.	Tusta Ram Reang	Male	44	Pastor		Udai Ram Reang	"		
44.	Pishonbati Reang	Female	40	House wife		Tusta Ram Reang	"		
45.	Thaswarai Reang	Male	16	Student	X	Joysing Reang	"	reang142@gmail.com	Thaiswa Rai
46.	Raben Reang	Male	26		IX	Amdai Reang	"		Raben Reang
47.	Dahu ram Reang	Male	24		IX	Paskajoy Reang	"		Dahu Ram Reang
48.	Amar Reang	Male	18		VIII				Amar Reang
49.	Khabi rung Reang	Female	30		V	Jashan rai Reang	"		Khabi rung Reang
50.	Kolonjoy Reang	Male	60						
51.	Chandarung Reang	Female	30			Niranjoy Reang	"		

(C)

Sl. NO.	Participant Name	Gender	Age	Occupation	Qualification	Father/Guardian/Husband	Village/Hamlet	Contact & Email	Signature
52.	Resmoiti Reang	Female	38	House wife	-	—	Tarini para		
53.	Chaitanya Reang	Male	55	Farmer	-	Horokumar Reang	Tarini para		
54.	Jarphanrai Reang	Male	57	"	-		Tarini para		
55.	Mostanjay Reang	Male	39	"	-	Kolonjay Reang	Tarini para		
56.	Shibaram Reang	Male	42	"	-		Tarini parra		
57.	Nagadi Reang	Male	23		BA	Pokhya kam Reang	Tarini Para.	nagadireang@gmail.com, 8857476351.	Nagadi Reang
58.	Aliza Reang.	Male	35	"	-		Tarini para		Aliza Reang
59.	Pusharam Reang	Male	26	"	X		Tarini para		Pusharam Reang
60.	Pusthsreng Reang	Female	37	Housewife	-	Mostanjay Reang	Tarini para		
61.	Jiban Reang	Male	30	-	-		Tarini para		
62.	Khela Mohan Debbarma	Male	29		MA		JICA Staff		Khela Mohan Debbarma
63.	Basudev Naha	Male	36		BA		JICA Staff		Basudev Naha
64.	Barabati Reang	Female	20			Chanda Reang	Tarini para		
65.	Arjakrai Reang	Male	35			Sukhindra Reang	Tarini para		Arjakrai Reang.
66.									

(D)

List of participants who attended PRA Exercise at different beneficiary villages (A-I)



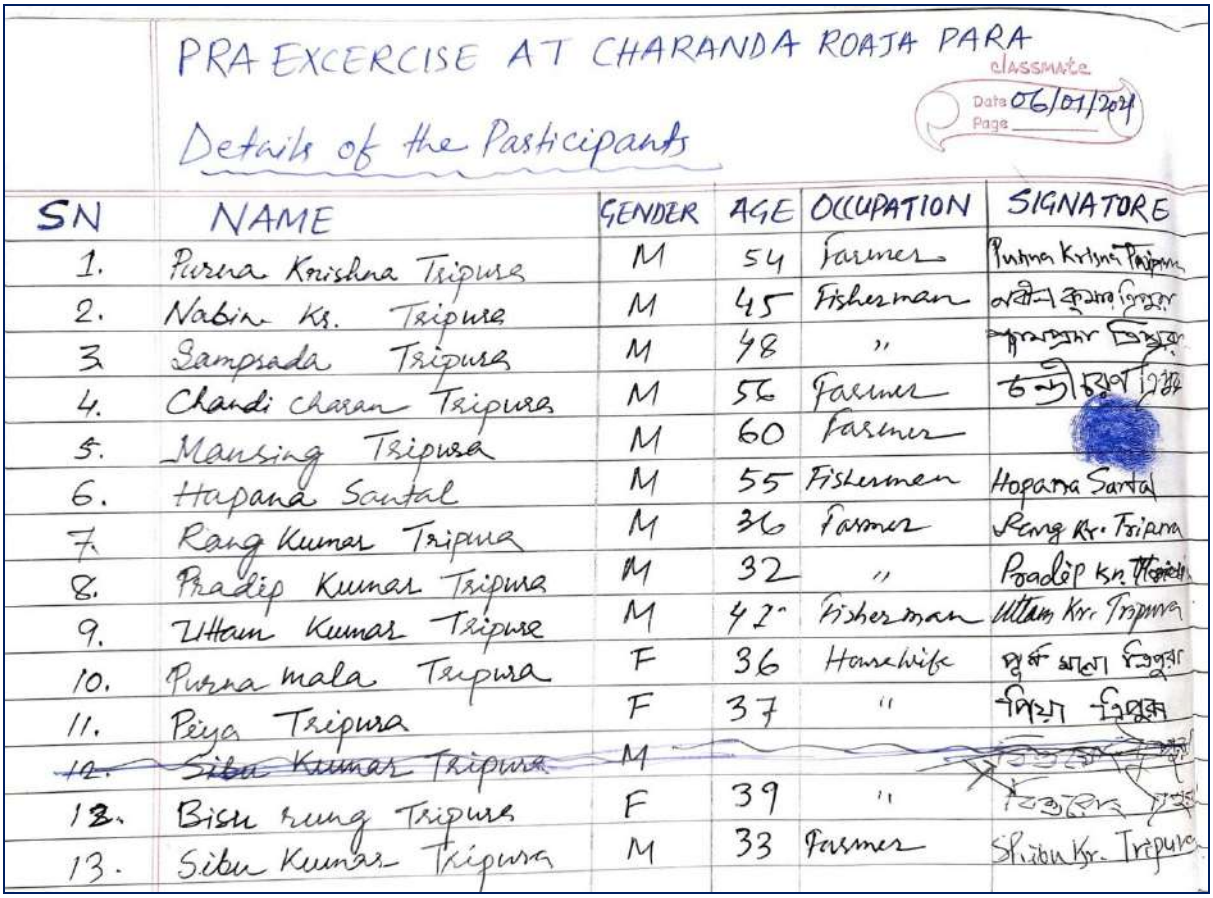
PRA EXCERCISE AT CHAPLINGCHARA PARA

Date 04/01/2024

Details of the Pasticiparts

SN	Name	Gender	Age	Occupation	Signature
1.	Ratan Tripura	M	20	Boatman	Ratan Joy Tripura
2.	Kulijoy Tripura	M	27	Farmer	Kulijoy Tripura
3.	Kathinjoy Tripura	M	46	Jhumias	-
4.	Arunjoy Tripura	M	35	Jhumias	[illegible]
5.	Behajoy Tripura	M	27	Farmer	Beha joy Tripura
6.	Khalendra Tripura	M	48	Farmer	Khalendra Tripura
7.	Resanda Tripura	M	38	Jhumias	-
8.	Mohanda Tripura	M	32	Fisherman	[illegible]
9.	Dharen Mohan Tripura	M	20	Fisherman	Dharen Mohan Tripura
10.	Hiren Mohan Tripura	M	19	Fisherman	Hiren Mohan Tripura
11.	Jayant Mohan Tripura	M	15	Student	Jayant Mohan Tripura
12.	Chandrani Tripura	F	23	Housewife	[illegible]

A. Participants details of PRA- Chaplingchara



PRA EXCERCISE AT CHARANDA ROAJA PARA

Date 06/01/2024

Details of the Pasticipants

SN	NAME	GENDER	AGE	OCCUPATION	SIGNATORE
1.	Purna Krishna Tripura	M	54	Farmer	Purna Krishna Tripura
2.	Nabin Kr. Tripura	M	45	Fisherman	[illegible]
3.	Sampada Tripura	M	48	"	[illegible]
4.	Chandi charan Tripura	M	56	Farmer	[illegible]
5.	Mansing Tripura	M	60	Farmer	[illegible]
6.	Hapana Santal	M	55	Fisherman	Hopana Santal
7.	Rang Kumar Tripura	M	36	Farmer	Rang Kr. Tripura
8.	Pradip Kumar Tripura	M	32	"	Pradip Kr. Tripura
9.	Utham Kumar Tripura	M	42	Fisherman	Utham Kr. Tripura
10.	Purna mala Tripura	F	36	Housewife	[illegible]
11.	Peya Tripura	F	37	"	[illegible]
~~12.~~	~~Sibu Kumar Tripura~~	~~M~~			
12.	Bishu rung Tripura	F	39	"	[illegible]
13.	Sibu Kumar Tripura	M	33	Farmer	Sibsu Kr. Tripura

B. Participants details of PRA- Charanda roaja Para

PRA EXCERCISE AT MONAFA Date: 08/01/2021

Details of the Participants are given below:

SN	NAME	GENDER	AGE	OCCUPATION	SIGNATURE
1.	Malsoma Molsom	M	40	Farmer	Malsoma Molsom
2.	Dhanbabu molsom	M	39	"	Dhan Babu Molsom
3.	Panchad hasi Molsom	M	60	"	[illegible]
4.	Prabhit chandra Molsom	M	50	Thuma	[illegible]
5.	Bhut Kumar Kaipeng	M	31	"	Bhut Kr. Kaipeng
6.	Bisma Baigo Molsom	M	40	"	[illegible]
7.	Lalmangai Molsom	M	45	"	Lalmangai Molsom
8.	Binoy Kr. Molsom	M	21	Student	Binoy Kr. Molsom
9.	Simeon Molsom	M	22	Student	Simeon Molsom
10.	Kilion Molsom	M	17	"	Kilion Molsom
11.	Jiten Singh Molsom	M	17	"	Jiten Singh Molsom
12.	B. Johana Molsom	M	17	"	B. Johana Molsom
13.	Manik Kishore Molsom	M	23	"	Manik Kishore Molsom

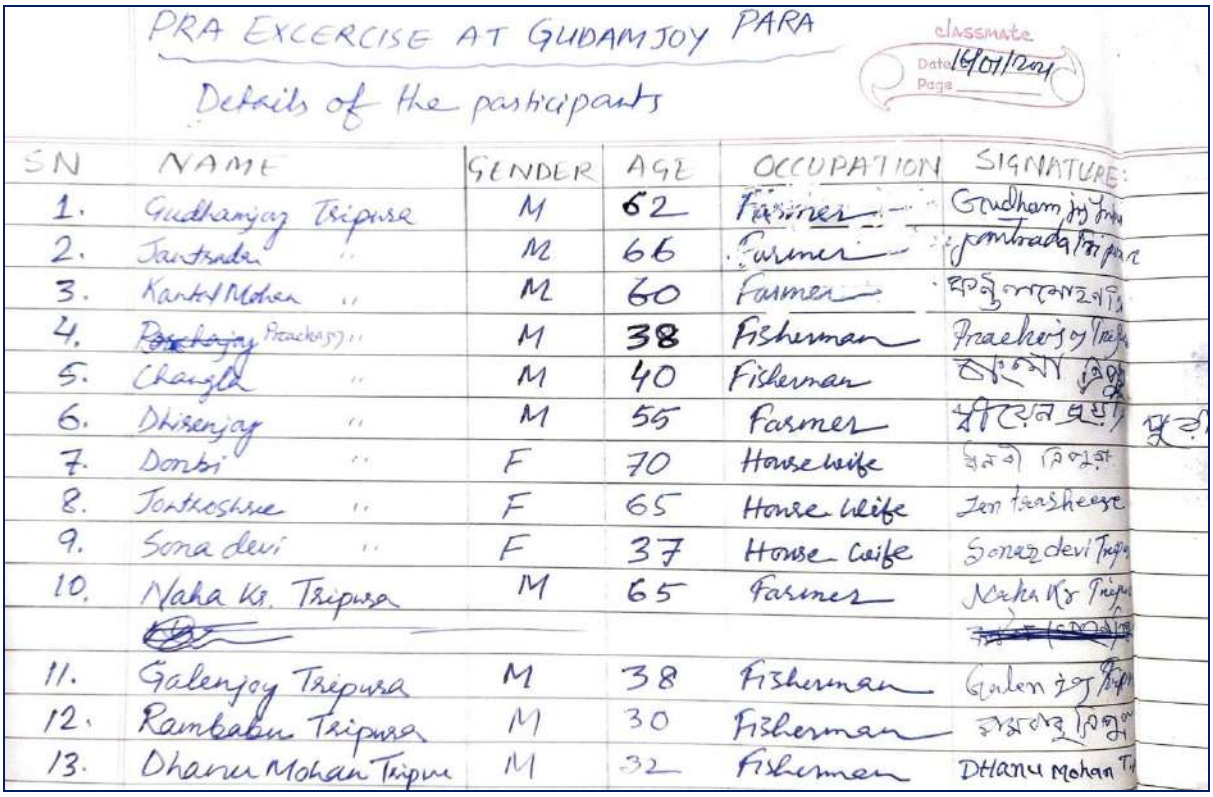
C. Participants details of PRA- Monafa

PRA EXCERCISE AT RASNADHAN PARA Date: 13/01/2021

Details of the Participants

SN	NAME	GENDER	AGE	OCCUPATION	SIGNATURE
1	Kanchajoy Tripura	M	42	Fisherman	Kanchajoy Tripura
2	Priti Mohan "	M	39		Priti Mohon Tripura
3	Kirtan Mohan Tripura	M	38	"	Kiran Mohan Tripura
4	Moin Kumar "	M	35	"	[illegible]
5	Sompakla "	M	32		Sem Reang
6	Ganga Mohan "	M	37	Shopkeeper	Ganga Mohan Tripura
7	Manasam "	M	22	Fisherman	Manasam
8	Bidhyajoy "	M	20	"	Bidhyajoy Tripura
9	Asha Laxmi Tripura	F	25	Ashawalker	Asha Laxmi Tripura
10	Mala Reang "	F	26	House wife	Mala Reang Tripura
11	Bimal Kanti	M	42	Fisherman	Bimal Kanti Tripura
12	Bisobi Tripura	F	33	House wife	[illegible]
13	Kito Mohan "	M	45	Fisherman	[illegible]
14	Gasi Mala "	F	38	House wife	[illegible]
15	Chandi Reang "	F	20	"	[illegible]

D. Participants details of PRA- Rashnadhan Para

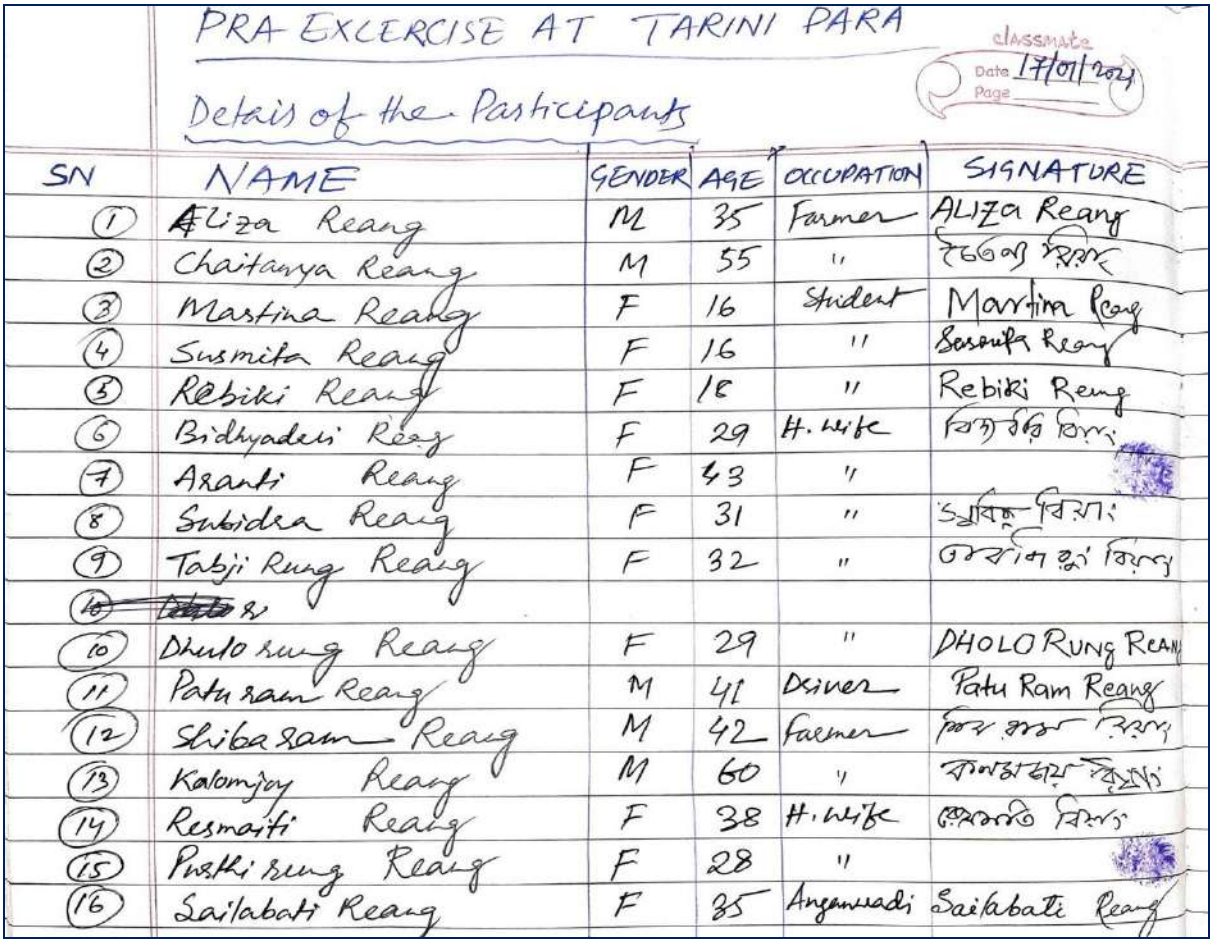


PRA EXCERCISE AT GUDAMJOY PARA

Details of the participants

SN	NAME	GENDER	AGE	OCCUPATION	SIGNATURE
1.	Gudhamjoy Tripura	M	62	Farmer	Gudhamjoy Tripura
2.	Jantrada "	M	66	Farmer	Jantrada Tripura
3.	Kanta Mohan "	M	60	Farmer	কান্তা মোহন ত্রিপুরা
4.	Prachajoy "	M	38	Fisherman	Prachajoy Tripura
5.	Changla "	M	40	Fisherman	চাংলা ত্রিপুরা
6.	Dhisenjoy "	M	55	Farmer	ধীসেন জয় ত্রিপুরা
7.	Dombi "	F	70	Housewife	ডমবী ত্রিপুরা
8.	Jantreshree "	F	65	House wife	Jantreshree
9.	Sona devi "	F	37	House Wife	Sona devi Tripura
10.	Naka Kr. Tripura	M	65	Farmer	Naka Kr Tripura
	[illegible]				[illegible]
11.	Galenjoy Tripura	M	38	Fisherman	Galenjoy Tripura
12.	Rambabu Tripura	M	30	Fisherman	রামবাবু ত্রিপুরা
13.	Dhanu Mohan Tripura	M	32	Fisherman	Dhanu Mohan Tripura

E. Participants details of PRA- Gudhamjoy Para

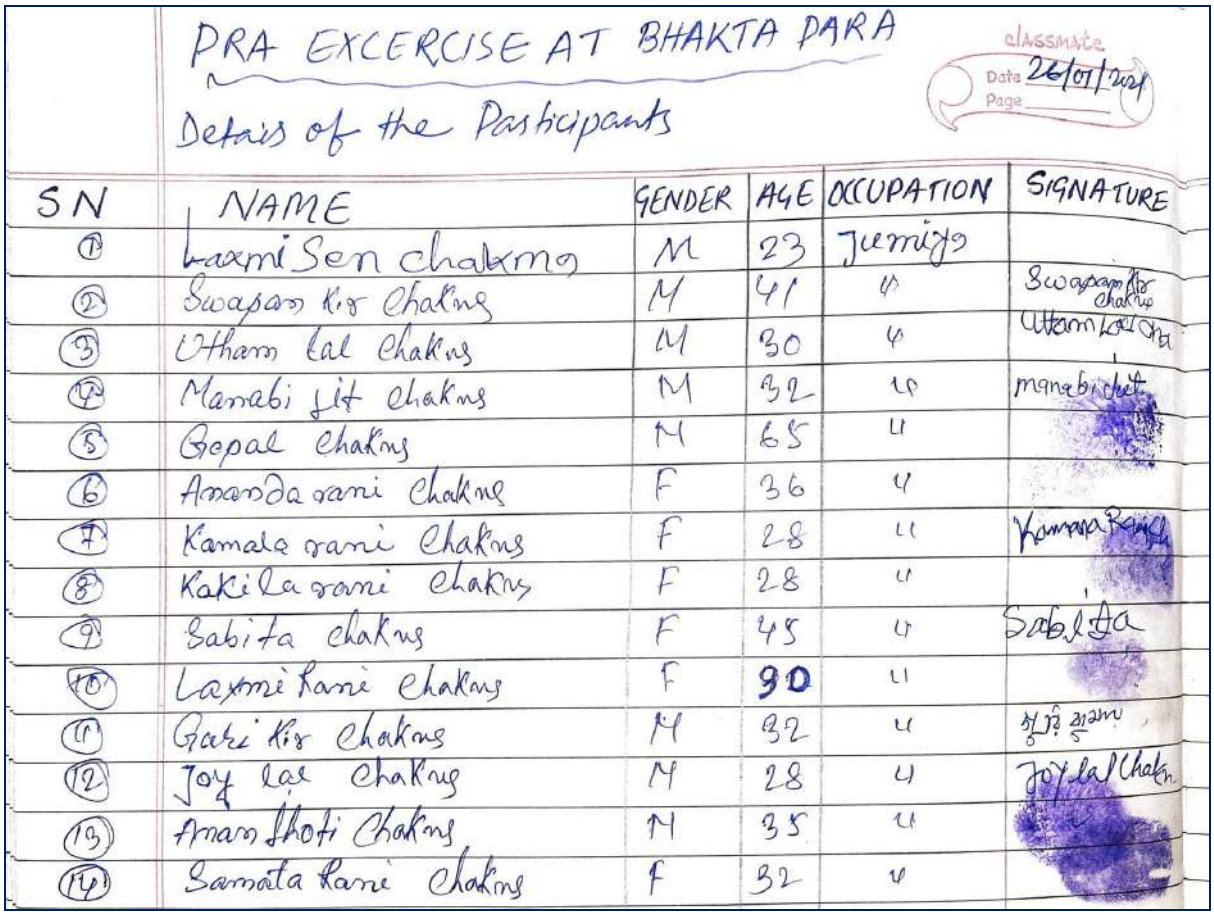


PRA EXCERCISE AT TARINI PARA

Details of the Pasticipants

SN	NAME	GENDER	AGE	OCCUPATION	SIGNATURE
(1)	Aliza Reang	M	35	Farmer	ALIZA Reang
(2)	Chaitanya Reang	M	55	"	চৈতন্য রিয়াং
(3)	Martina Reang	F	16	Student	Martina Reang
(4)	Susmita Reang	F	16	"	Susmita Reang
(5)	Rebiki Reang	F	18	"	Rebiki Reng
(6)	Bidhyadevi Reang	F	29	H. wife	বিদ্যা রিয়াং
(7)	Aranti Reang	F	43	"	
(8)	Subidra Reang	F	31	"	সুবিদ্রা রিয়াং
(9)	Tabji Rung Reang	F	32	"	তাবজি রুং রিয়াং
(10)	[illegible]				
(10)	Dhulo rung Reang	F	29	"	DHOLO RUNG REANG
(11)	Patu ram Reang	M	41	Driver	Patu Ram Reang
(12)	Shiba ram Reang	M	42	Farmer	শিব রাম রিয়াং
(13)	Kalomjoy Reang	M	60	"	কালাচাঁদ রিয়াং
(14)	Resmaiti Reang	F	38	H. wife	রেসমাইতি রিয়াং
(15)	Pushki rung Reang	F	28	"	
(16)	Sailabati Reang	F	35	Anganwadi	Sailabati Reang

F. Participants details of PRA- Tarini Para

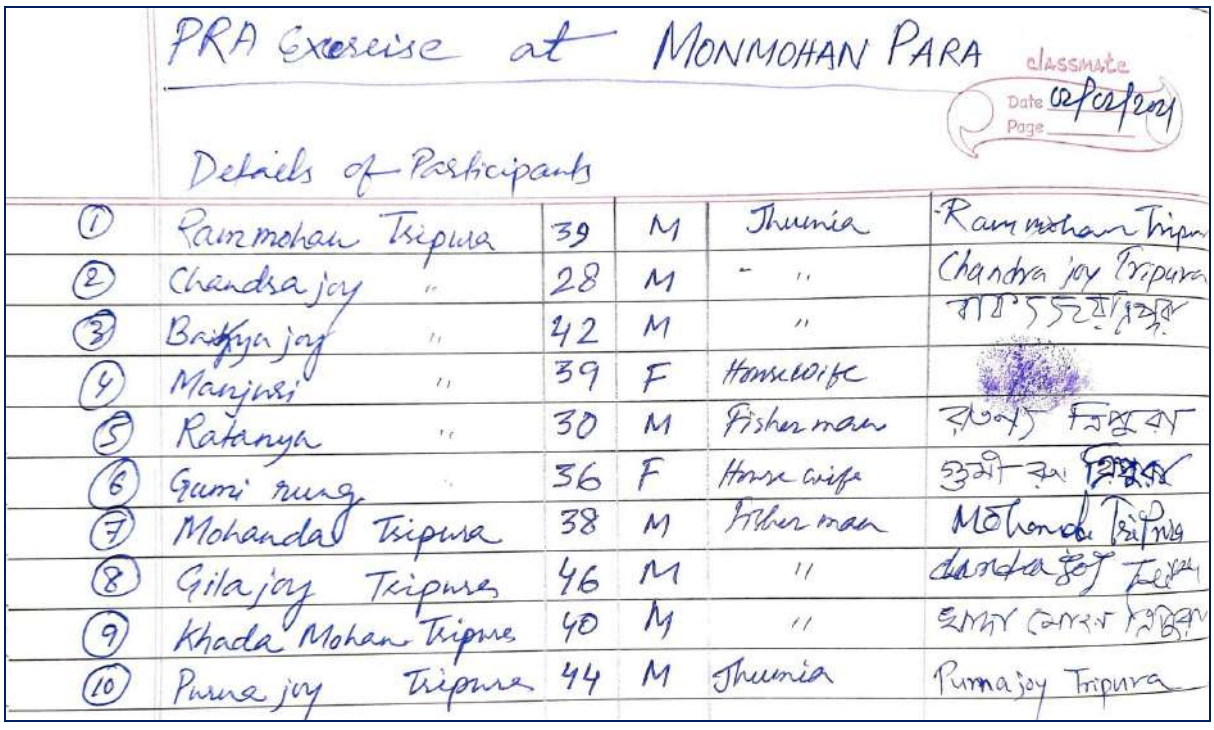


PRA EXCERCISE AT BHAKTA PARA

Details of the Participants

SN	NAME	GENDER	AGE	OCCUPATION	SIGNATURE
1	Laxmi Sen chakma	M	23	Jumijo	
2	Swapan Kir Chakma	M	41	"	Swapan Kir Chakma
3	Utham Lal Chakma	M	30	"	Utham Lal Cha
4	Manabi jit chakma	M	32	"	manabi chit
5	Gopal chakma	M	65	"	
6	Amanda rani Chakma	F	36	"	
7	Kamala rani Chakma	F	28	"	Kamala Rani
8	Kakila rani chakma	F	28	"	
9	Sabita chakma	F	45	"	Sabita
10	Laxmi Rani chakma	F	90	"	
11	Gaki Kir Chakma	M	32	"	[illegible]
12	Joy Lal Chakma	M	28	"	Joy Lal Chakma
13	Aman Thoti Chakma	M	35	"	
14	Samata Rani Chakma	F	32	"	

G. Participants details of PRA- Bhakta Para



PRA Exercise at MONMOHAN PARA

Details of Pasticipants

1	Ranmohan Tripura	39	M	Jhumia	Ranmohan Tripura
2	Chandra joy "	28	M	"	Chandra joy Tripura
3	Brishya joy "	42	M	"	[illegible]
4	Manjusri "	39	F	Housewife	
5	Ratanya "	30	M	Fisherman	[illegible]
6	Gumi rung "	36	F	House wife	[illegible]
7	Mohanda Tripura	38	M	Fisherman	Mohonda Tripura
8	Gila joy Tripura	46	M	"	[illegible]
9	Khada Mohan Tripura	40	M	"	[illegible]
10	Purna joy Tripura	44	M	Jhumia	Purnajoy Tripura

H. Participants details of PRA- Manmohan Para (Gumti)

PRA EXERCISE AT DHANBABU PARA

Date 04/09/2021

SN	Name of Participants	Gender	Age	Occupation	Signature
1	Rabimohan Reang	M	35	House wise	Rabi Mohan Reang
2	Kishanjoy Reang	M	24	Student	Kishanjoy Reang
3	Jibanto Reang	M	25	"	Jibanta Reang
4	Santush "	M	24	"	Santosh Reang
5	Dijendra "	M	23	Farmer	দিজেন্দ্র রিয়াং
6	Mainajay "	M	28	Farmer	Mainja JOY Reang
7	Shyanjoy "	M	26	Farmer	শ্যামজয় রিয়াং
8	Bazar rai "	M	53	"	Balajoy Reang
9	Tanji rai "	M	28	Farmer	Tanji Rai Reang
10	Tirtho ram "	M	46	Social worker	Tirtha Ram Reang
11	Mano Reang "	F	38	House wife	মনতি রিয়াং
12	Nanda rani "	F	28	Housewife	নন্দ রানী রিয়াং
13	Nispa Reang "	F	45	Housewife	নিষ্পা রিয়াং
14	Nayani "	F	30	"	Nayani Reang
15	Upendra "	M	32		উপেন্দ্র রিয়াং
16	Anita "	F	18	Student	Anita Reang
~~17~~	~~Khuphe rai~~ "				
~~18~~	~~Chikon rai~~ "				
17	Birja Kr. Reang	M	68	Farmer	বীরা কুমার রিয়াং
18	Joy Chandra Reang	M	69	Farmer	জয় চন্দ্র রিয়াং

I. Participants details of PRA- Dhababu Para

Awareness programme conducted by Project staffs (A-B)

A. Displaying Some Documentary Films like, "Forest man of India", " Elephant Country", "Back to the Root"

B. JPF Explaining documentary films to the villagers and also making aware about the importance of Conservation

Sensitization Program- Popular talk and Screening of Documentary at Schools (A-D)

(A) JPF Explaining the Documentary at Gandachara Class XII School

(B) PI giving some practical talk at Raishyabari Class XII School

(C) Sensitization at Gandachara Class XII School

(D) Sensitization at Raishyabari Class XII School

Sensitization Program - Popular talk and Screening of Documentary at villages (E-H)

(E) Sensitization at Tarini Reang para

(F) Sensitization at Jibakarta para (Monafa)

(G) Sensitization at Leypada para

(H) Sensitization at Ranjit Roaja para

Appendix 4

(Not Applicable)

Appendix 5

(Not Applicable)

Appendix 6

(Details of Technology Developed)

FORMATION OF ECOTOURISM MANAGEMENT COMMITTEE FOR DEVELOPING A NEW MODEL OF HOMESTAY BASED ECOTOURISM AT TARINI PARA

PROCEEDINGS OF MEETING

TariniReangpara, Pancharatan ADC Village

Date: 17/02/2020, Time: 6:50pm

Place: Residence of JoysingReang

RESOLUTION

Today, 17th February, 2020 (Saturday) a meeting was held at the residence of Mr. JoysingReang, Secretary of Tarini para Baptist Church based on the previous meeting on 06/02/2020, 09/02/2020 & 10/02/2020 with the officials from NMHS Project, TU for the creation of Homestay for conservation-based tourism in our village. Mr. Chatoinya Reang was chosen as the Chaiman of the Meeting and the discussion started with the word of Prayer by the Chairman himself. Mr. RamjoyReang, Chowdhury of Tarini para was also present in the meeting. Based on the idea of the project briefed by Dr. Thiru Selvan, PI of the project and Mr. Kiran Kr. Murasing, JPF of the Project on the previous meetings we had long discussion regarding the matter and based on the discussion following decision were made in mutual understanding:

1. With majority support we have decided to take over the work for establishing Homestay in our village. We have decided that only a person who come willingly to be a member of the society will be part of it.
2. We have decided to keep the name of the Society as **Leinghoihthai**
3. The construction of cottage (Eco-hut) will be started from tomorrow i.e, 18/02/2020.
4. A committee has been formed for the management of the society which is below in the table.
5. The committee will have the power to add or remove a member from the society as per the performance of individual.
6. Every member of the society must abide by the Rules and Regulation of the society.
7. For the financial support from NMHS for building Eco-Hut we have chosen a Bank Account of Mrs. SAILABATI REANG.

   A/C: 8094012330345 (Tripura Gramin Bank); Branch:GandacherraIFSC: UTBI0RRBTGB; UID No: 516802791802

COMMITTEE MEMBERS

SN	NAME	GENDER	DESIGNATION	SIGNATURE
1	ChatoinyaReang	M	President	
2	TustaramReang	M	Vice-President	Tustaram Reang
3	JoysingReang	M	Secretary	Joy Sing Reang
4	LalnunmaiwiaReang	M	Asst. Secretary	
5	SailabatiReang	F	Cashier	Sailabati Reang
6	RamjoyReang	M	Member	
7	Jarphan rai Reang	M	Member	
8	SuchindraReang	M	Member	
9	SukunraiReang	M	Member	
10	BirchandraReang	M	Member	
11	SiboramReang	M	Member	
12	Aliza Reang	M	Member	
13	KhajiramReang	M	Member	
14	NipendraReang	M	Member	
15	ChakramaniReang	M	Member	

(Page-1)

OTHER MEMBERS OF THE SOCIETY

SN	NAME	GENDER	SIGNATURE
16	NagadiReang (BA)	M	Nagadi Reang.
17	Bikram Tripura	M	Bikram Tripura
18	NamenjoyReang (BA)	M	Naman Joy Reang
19	Aijak rai Reang	M	Aijakrai Reang
20	MastanjoyReang	M	মস্তীর জয় রিয়াং
21	SithakraiReang	M	Sithakrai Reang
22	Khobi rung Reang	F	Khobi rung Reang
23	Jitendra Reang	M	জিতেন্দ্র রিয়াং
24	Khanda rai Reang	M	Khandarai Reang
25	RantajoyReang	M	Ratan Joy Reang
26	Khanda ram Reang	M	Khanda ram Reang
27	ResmointiReang	F	রেসমতি রিয়াং
28	Potu ram Reang	M	Paturam Reang
29	Rati rai Reang	M	Rati rai Reang
30	Kamala batiReang	F	কমলা বতিরিয়াং
31	Amdoi rai Reang	M	আমদাই রিয়াং
32	KamendraReang	M	কমেন্দ্র রিয়াং
33	KolanjoyReang	M	কলঞ্জয় রিয়াং
34	ChurabatiReang	F	চেরাবতি রিয়াং
35	NajiramReang	M	Naji Ram Reang
36	Durba joy Reang	M	Durga Joy Reang
37	BrajakumarReang	M	Brajakumar Reang
38	Songa ram Reang	M	Songa Ram Reang
39	KaishopaReang	M	কৈশপা রিয়াং
40	JanamohanReang	M	Janamohan Reang
41	Chabi rung Reang	F	চাবি রাং রিয়াং
42	Pusha ram Reang	M	Pusha ram Reang
43	NibedanReang	M	Nibedan Reang

The meeting ended with the word of encouragement and prayer by Mr. ChatoinyaReang, President of the Society.

Chowdhury

President

Joy Sing Reang
Secretary

(Page-2)

AN ECO-HUT CONSTRUCTED AT TARINI PARA FOR HOMESTAY

Appendix 7
Other Details

ANNEXURE-1

DETAILS OF SCIENTIFIC DATA COLLECTED

Species of bamboo found in Study site

S NO	Common Name	*Scientific Name*
1	Muli	*Melocanna baccifera*
2	Mritinga	*Bambusa tulda*
3	Rupai	*Dendrocalamus longispathus*
4	Pecha	*Dendrocalamus hamiltonii*
5	Dolu	*Schizostachyum dullooa*
6	Lata or wadu or Sarail Bans	*Melocalamus compactiflorus*
7	Barak	*Bambusa Balcooa*
8	Kantha Bans	*Bambusa bambos Syn. B. arundinacea*
9	Bam or Bethua Bans	*Bambusa cacharensis Tetua*
10	Paora	*Bambusa polymorpha Syn. B. teres*
11	Kai or Pichli	*Bambusa nutans Syn. B. teres*
12	Bari or Jai	*Bambusa vulgaris*
13	kanak Kaich	*Thyrostachys oliveri Syn. B. affinis*
14	Makal	*Bambusa pallida*
15	Hedge Bamboo	*Bambusa multiplex*

List of plants found in study site which yield dye and tan

S No	Botanical Name	Part Used
1	*Adenanthera pavonina*	Wood
2	*Adhatoda vasica*	Leaves
3	*Aegle marmelos*	Rind of the fruit
4	*Alpinia galanga*	Root, stalk
5	*Althaea rosea*	Flowers
6	*Anacardium occidentale*	Pericarp
7	*Annona reticulata*	Fruit, shoots
8	*Bauhinia purpurea*	Bark
9	*Bixa orellana*	Pulp (aril) surrounding the seeds
10	*Bougainvillea glabra*	Flower with ivory white bracts
11	*Carthamus tinctorius*	Flowers
12	*Cassia fistula*	Bark and Sapwood
13	*Cassia tora*	Seeds
14	*Chukrasia tabularis*	Flowers and leaves
15	*Commelina benghalensis*	Juice of the flower
16	*Curcuma zedoaria*	Rhizome
17	*Dipterocarpus spp.*	Bark
18	*Garcinia tinctoria*	Fruit and bark
19	*Garcinia xanthochymus*	Bark and Timber
20	*Impatiens balsamina*	Flower

21	*Indigofera tinctoria*	Green crop
22	*Lawsonia alba*	Leaves
23	*Mallotus philippensis*	Fruits
24	*Mangifera indica*	Bark and leaves
25	*Nyctanthes arbortristis*	Flower
26	*Prunus persica*	Leaves, Root bark
27	*Punica granatum*	Fruit rind
28	*Tagetes erecta*	Flower
29	*Tagetes patula*	Flower
30	*Terminalia arjuna*	Bark
31	*Terminalia chebula*	Fruits
32	*Tectona grandis*	Leaves
33	*Ventilago madraspatana*	Root and Bark
34	*Ziziphus jujuba*	Fruit
35	*Abrus precatorious*	Seed
36	*Achyranthes aspera*	Whole plant
37	*Emblica officinalis*	Fruit and Bark
38	*Lagerstroemia parviflora*	Bark
39	*Lannea coromandelica*	Bark and resin
40	*Mirabilis jalapa*	Flower
41	*Oroxylum indicum*	Bark and Fruit
42	*Phlogacanthus thyrsiformis*	Whole plant
43	*Solanum nigram*	Seed

List of plants found in study site which yield oil

S NO	Botanical Name	Commercial product
	Essential oils	
1	*Cymbopogon nardus*	Whole plant
2	*Aquillaria malaccensis*	Wood
3	*Cinnamomum camphora*	Wood and leaf
4	*Michelia champaca*	Flower
5	*Mimusops elengi*	Flower
	Seed oil	
6	*Actinodephnae angustifolia*	Seed oils
7	*Actinodephnae obovata*	Seed oils
8	*Azadirachta indica*	Seed oils
9	*Garcinia cowa*	Seed oils
10	*Garcinia acuminata*	Seed oils
11	*Garcinia lanceaefolia*	Seed oils
12	*Garcinia tinctoria*	Seed oils
13	*Garcinia xanthocyhmus*	Seed oils
14	*Hydnocarpus kurzii*	Seed oils
15	*Mallotus phillipinensis*	Seed oils
16	*Melia azedarach*	Seed oils
17	*Mesua ferrea*	Seed oils
18	*Mimusops elengi*	Seed oils

19	*Pongamia pinnata*	Seed oils
20	*Shorea robusta*	Seed oils

List of Plants found in study site yielding fibre and flosses

S NO	Botanical Name	Commercial Fibres
1	*Abroma angusta*	Perennial Indian hemp, Devil's cotton
2	*Agave cantala*	Maguey, Cantala, Bombay hemp, Bombay aloe
3	*Ananas comosus*	Pina fibre
4	*Boehmeria nivea*	Ramie fibre, China grass, Rhea, Chinese silk plant
5	*Bombex ceiba*	Indian Kapok
6	*Calotropis gigantea*	Akund fibre
7	*Cannabis sativa*	Hemp fibre
8	*Caryota urens*	Kittul fibre, Salopa
9	*Cocos nucifera*	Coconut fibre, Coir
10	*Corchorus capsularis*	Jute butts, Narcha
11	*Corchorus olitorius*	Tossa jute, Daisee, Jew's mallow
12	*Crotalaria juncea*	Sunn, Sannhemp
13	*Gossypium herbaceum*	Tula
14	*G. arboreum*	Tula
15	*G. barbadense*	Tula
16	*G. hirsutum*	Tula
17	*Hibiscus cannabinus*	Mesta
18	*Linum usitatissimum*	Flax
19	*Oreocnide integrifolia*	Risa fibre, Ban rhea
20	*Sansevieria roxburghiana*	Indian Bowstring Hemp; Murva fibre
21	*Urena lobata*	Aramina Fibre; Congo Jute

List of plants found in study site yielding gums, resins and oleoresins

S NO	Botanical Name	Commercial product
1	*Azadirachta indica*	
2	*Anacardium occidentale*	Cashew
3	*Combretum spp*	Gum arabic
4	*Albizia spp*	Gum arabic
5	*Leucaena spp.*	Gum arabic
6	*Sterculia villosa*	Karaya
7	*Cassia tora*	
8	*Bombax ceiba*	
9	*Sesbania bispinosa*	

10	*Shorea robusta*	Damar
11	*Canarium strictum*	Elemi (Balsam)
12	*Palaquium spp*	Gutta Percha
13	*Tamarindus indica*	
14	*Aquillaria spp.*	Gaharu resin
15	*Garcinia spp.*	Gamboge
16	*Dipterocarpus spp.*	Dammar

List of leafy vegetables consumed in the study site

S NO	Common Name	Scientific Name	Habit	Local consumption in Tripura
1	Thankunipata/ Samchota	*Centella asiatica*	Creeper	Used as vegetable and also as medicine in case of dysentery
2	Muchingpata	*Xanthoxyllum spps*	Tree	Used as vegetable
3	Bilati dhaniapata/ Kachin Masala	*Erygium foetidum*	Herb	Used as condiment. Roots used as in stomachic
4	Chirchiri/ Banmura kachu	*Monochoria hastate*	Aquatic Herb	Sun dried leaves used as vegetable throughout the year, also used as medicine in edema, jaundice, and also as laxative
5	Ghimasakh/ Bukhate	*Polycarpon prostratum*	Herb	Used as vegetable by both tribals & non tribals
6	Khargonpata	*Typhonium trilobatum*	Herb	Used as vegetable and also as diuretic

List of leafy-stem vegetables consumed in study site

S NO	Common Name	Scientific Name	Habit	Local consumption in Tripura
1	Dekisakh/ Mukunchuk	*Diplazium esculentum*	Herb	Used as vegetable
2	Alencha	*Enhydra fluctuans*	Herb	Used as vegetable, and also as medicine. It is diuretic, useful in skin, hepatic, neural diseases, and in case of insomnia
3	Kalmisakh/ Kalmibasak	*Ipomoea aquatica*	Herb	Used as vegetable, fodder and as medicine
4	Kantakachu/ Kantha	*Lasia spinosa*	Herb	Used as vegetable
5	Panilajuk/ Kharaisakh	*Neptunia prosprata*	Herb	Used as vegetable, leaf juice used in Jaundice
6	Kachoripana	*Eichhornia orassipes*	Herb	Used as fodder, compost, for making bio-gas
7	Harjora/ Naljora	*Cissus quadrangularis*	Climbing shrub	Used as vegetable, pulp of the stem used for curing fracture bone

List of shoot vegetables consumed in study site

S NO	Common Name	Scientific Name	Culm	Local consumption in Tripura
1	Mritinga/ Owandal	*Bambusa tulda*	Greyish green, ringed below the nodes, stem sheath glabrous, hairy/ white powered	Tender culms used as vegetables
2	Muli/ Wathwi	*Melocanna baccifera*	Woody, grows from rhizome, bears sheath with reduced blade	Tender culms used as vegetable. Alkali water prepared from it used in stomach trouble, and also used as an anti-malarial anecdote
3	Sil-Barak/ Owachur	*Bambusa balcooa*	Stout with hollow internodes, nodes with whitish ring above	Tender culm used as vegetable

List of Root-Tuber Vegetables consumed in study site

S NO	Common Name	Scientific Name	Habit	Local consumption in Tripura
1	Banallo/ Thabarchuk	*Dioscorea glabra*	Climber	Used as vegetable
2	Banallo/ Ganga	*Dioscorea hamiltonii*	Climber	Tuber and tender stem used as vegetable
3	Batema/ Ol	*Amorphophallus campanulatus*	Herb	Fresh corm and sun dried cakes used as vegetable
4	Kachu, lati/ Muitulati	*Colocasia esculenta*	Herb	Used as vegetable

List of stem vegetables consumed in study site

S NO	Common Name	Scientific Name	Habit	Local consumption in Tripura
1	Chubui/ Muikhun	*Musa acuminata*	Herb	Both young and mature stem used as vegetable
2	Gandhari/ Gandhaki	*Homalomena aromatica*	Shrub	Tuber, petiole and flowers used as vegetables
3	Tara/ Tharai	*Alpinia allughas*	Herb	Stem and flowers used as vegetables
4	Bagduga/ Muimarang	*Amorphophallus bulbifer*	Herb	Used as vegetable
5	Biring	*Alpinia sp*	Herb	Used as vegetable

List of flowers consumed as vegetables in study site.

S NO	Common Name	Scientific Name	Habit	Local consumption in Tripura
1	Mucha/ Muikhun	*Musa acuminata*	Herb	Used as vegetables
2	Kachuful	*Colocasia esculenta*	Herb	Used as vegetable
3	Bakful	*Sesbania grandiflora*	Tree	Tender leaves and flower are used as vegetable, also used as fodder
4	Adaful/ Haiching	*Zingiber officinale*	Herb	Used as vegetable extract of stem used as expectorant
5	Haldiful/ Sutui	*Curcuma domestica*	Herb	Used as vegetable, rhizome used as condiment, also used as externally in cut injury, fracture and dislocation of bone

List of fruit vegetables consumed in study site

S NO	Common Name	Scientific Name	Habit	Local consumption in Tripura
1	Banbegun/ khamkasikum	*Solanum torvum*	Shrub	Used as vegetable
2	Bakair begun/ khamka	*Solanum indicum*	Shrub	Used as vegetable
3	Telakuchi/ Taokha thaichmu	*Coccinia grandis*	Climber	Leaves and fruit used as vegetable, root, stem and leaves used as medicine in skin disease, bronchitis and diabetes
4	Chalta	*Dellinia indica*	Tree	Used as vegetable and to make prickle, chutney, and also used as medicine in cold and cough
5	Biikang/ Makhan shim	*Canavelia gladiata*	Climber	Used as vegetable, used as medicine in hernia, colic antibillious and in irritation of mucous membrane
6	Amlaki/ Amla	*Emblica officinalis*	Tree	Eaten raw, used in pickles, used as medicine in anaemia, cold and cough and in jaundice
7	Nokka/ Kanak	*Oroxylum indicum*	Tree	Consumed as a vegetable, anti-flatulent and reliever of colic
8	Tekroi/ subra	*Flacourtia jangomas*	Tree	Raw fruit are eaten

List of seeds as vegetables consumed in study site

S NO	Common Name	Scientific Name	Habit	Local consumption in Tripura
1	Kathal biz	*Artocarpus heterophylla*	Tree	Fruit eaten raw, seeds eaten after cooking
2	Makhna/ Thangjing	*Euyale ferox*	Aquatic herb	Raw and roasted seeds are eaten
3	Makal	*Trichosanthes bracteata*	Climber	Roasted seeds are eaten, also used as medicine

List of Medicinal plants found in study site

S. No.	Scientific name	Local name	Parts used
1	*Abroma angusta*	Ulatkambal/Bankopali	Root bark
2	*Abrus precatorius*	Kunch	Root and seed
3	*Abutilon indicum*	Petari	Leaves, juice of leaves, bark, seed & roots
4	*Acacia concinna*	Banritha	Pod & Leaves
5	*Acacia pennata*	--	Barks, leaves, stems, fruits
6	*Acalypha indica*	Muktajari/ Khokli	Plants, roots & leaves
7	*Achyranthes aspera*	Apang	Plants, roots & seeds
8	*Acorus calamus*	Bach	Rhizome
9	*Adhatoda vasica*	Vasaka	Leaves, roots & flowers
10	*Aegle marmelos*	Bel	Root, bark, fruits
11	*Ageratum conyzoides*	Pichas	Root, Leaves & Flowers
12	*Alphonsea ventricosa*	Naga kala	Leaves
13	*Anacardium occidentale*	Kojubadam	Roots, Barks & Fruits
14	*Andrographis periculata*	Kalmegh	Plant, root & Leaves
15	*Anthocephalus cadamba*	Kadam	Bark & Leaves
16	*Ananas comosus*	Anaras	Leaves & Fruits
17	*Annona reticulate*	Nona	Bark, leaves & Seeds
18	*Aquilaria malaccensis*	Agar	Wood
19	*Argemone maxicana*	Shialkata	Root & Seeds
20	*Asclepias curassavica*	-	Roots & Leaves
21	*Asparagus recemosus*	Satamuli	Root
22	*Averrhoa carambola*	Kamranga	Fruits
23	*Bacopa monneri*	Brahmisak	Plants, Stem & Leaves
24	*Baliospermum montanum*	Danti	Root, Leaves & Seeds
26	*Blumea balsamifera*	Kukursanga	Whole Plant
27	*Blumea lacera*	Kukursanga	Plants, Roots & Leaves
28	*Butea parviflora*	Jong-obi	Bark & Root
29	*Calotropis gigantea*	Akan	Root, Bark, Leaves & Latex
30	*Cardiospermum*	Lataphatkari/ putka	Plants

	halicacabum		
31	*Cassia occidentalis*	Kalkasunda	Plants, roots, Leaves & Seeds
32	*Cassia tora*	Chakunda	Leaves & Seeds
33	*Cassia sophera*	Kalkasunda	Plants, leaves & seeds
34	*Centella asiatica*	Thunimancuni	Plants & Leaves
35	*Chenopodium album*	Bethushag/ Betua sag	Plants
36	*Chenopodium ambrosiodes*	Bethushag	Plant
37	*Chloanthus officinalis*	-	Root & Leaves
38	*Cinnamomum glanduliferum*	-	Wood
39	*Clematis gouriana*	-	Leaves & Stem
40	*Cleome viscosa*	Hurhuria	Leaves & Seeds
41	*Cinnamomum iners*	Jangli-darchini	Bark & Seeds
42	*Clerodendron viscosum*	Bhait, juthur	Root, leaves & flower
43	*Coccinia cordifolia*	Telakucha	Plants, roots & leaves
44	*Commelina benghalensis*		Whole plants
45	*Cordia dichotoma*	Kala-uja/ Banari	Fruits,bark & leaves
46	*Croton roxburghii*	Baragach	Bark, root, fruit & seeds
47	*Crotalaria spectabilis*	Jhun jhunui	Stem, leaves & seeds
48	*Curculigo orchioides*	Talamuli	
49	*Curcuma amada*	Amada	Rhizome
50	*Custuca reflexa*	Algusi,Sunylaya	Plant, seeds
51	*Cynodon dactylon*	Durba	Plant
52	*Cyperus rotundus*	Sunda	Tubers
53	*Datura metel*	Dhutura	Leaves,roots & seeds
54	*Datura stramonium*	Dhutura	Leaves & fruits
55	*Deeringia amaranthoides*	Jolamohani	Root & leaves
56	*Desmodium triquetrum*		Leaves
57	*Dioscorea alata*	Chupri alu	Tubers
58	*Dioscorea bulbifera*	Banaalu	Tubers
59	*Dioscorea pentaphylla*	Kanta Alu	Tubers
60	*Eclipta prostrata*	Kestuki,Keysutra	Plant, root & leaves
61	*Emblica officinalis*	Amalaki	Root, bark, flower & fruits
62	*Entada phaeioloids*	Ghila	Seed, stem & bark
63	*Eupatorium odoratum*	Pichas	Plant
64	*Euphorbia hirta*	Baro khernie	Plant
65	*Euphorbia thymifolia*	Dudiya	Leaves & seeds
66	*Ficus bengalensis*	Bot	Root, fibers, leaves & seeds
67	*Ficus hispida*	Dengura/ Dumur	Bark, fruit & seeds
68	*Ficus racemosa*	Jirbat	Root, bark, leaves & fruit
69	*Garcinia cowa*	Kau/ Cowa/ Kok	Gum, resin
70	*Garcinia xanthocymus*	Tamal	Fruit
71	*Gleichenia liniaris*		Rhizome and fronds
72	*Heliotropium indicum*	Hatisur	Whole plant
73	*Hemidesmus indicus*	Anantamul	Root
74	*Hydrocotyle sibthorpoides*	Thunimancuni	Whole plant
75	*Ichnocarpus frutescens*	Dhudilata/ Shyamlata/ Paralia lata	Roots & leaves

76	*Jasminum sambac*	Belphul	Plant, root, leaves & flowers
77	*Luffa cylindrica*	Dhundul/ Phoro/ Pholo	Seeds
78	*Mallotus philippensis*	Kishur/ Tung	Glands & hairs on the fruit
79	*Mimosa pudica*	Chhoitemara	Leaves and stem
80	*Nelumbo nucifera*	Padma	Root, leaves, flower & seeds
81	*Nymphaea stellata*	Nil sapla	Root, stock & flower
82	*Oxalis corniculata*	Amrul	Plant
83	*Paederia foetida*	Badhali pata	Plant, root & leaves
84	*Pavetta indica*	Kukurchura/ Kalda	Root & leaves
85	*Passiflora foetida*	Jhumkolata	Leaves & fruits
86	*Pergularia extensa*	Ghagul Banti	Root, bark, plant & leaves
87	*Phlogacanthus thyrsiflorus*	Basak	Leaves
88	*Ricinus communis*	Bherenda	Seed
89	*Saccharum spontaneum*	Kash	Plant
90	*Scindaspus officinalis*	Gaj pipul	Fruit
91	*Sida cordifolia*	Bherela/Bala	Plant, root, juice & seed
92	*Solanum indicum*	Bekair	Root
93	*Solanum nigrum*	Kakmachi	Plant & fruit
94	*Solanum xanthocarpum*	Kantikari	Root, stem, flower & fruit
95	*Spilanthes acmella*		Plant, flower & and seeds
96	*Streblus asper*	Sheora	Bark & root
97	*Tamarindus indica*	Tetul	Fruits
98	*Terminalia bellirica*	Bahera/Bakhla	Fruits
99	*Terminalia chebula*	Haritaki	Bark & fruit
100	*Terminalia tomentosa*	Piasal	Bark
101	*Tinospora cordifolia*	Gulancha	Plant
102	*Vanda tessellata*	Rashna	Root & leaves
103	*Vitex peduncularis*	Awal	Bark & leaves
104	*Xanthium strumarium*	Ghagra	Plant, root & flower
105	*Xeromphis spinosa*	Mon/Beolem	Bark & roots

List of wild Mushrooms found in study site

S NO	Scientific Name	Family	Edibility
1	*Agaricus bisporus*	Agaricaceae	Edible
2	*Agaricus subrufescens*	Agaricaceae	Edible
3	*Agrocybe aegerita*	Strophariaceae	Edible
4	*Amauroderma sp*	Ganodermataceae	Medicinal
5	*Cordyceps sinesis*	Ophiocordycipitaceae	Medicinal
6	*Flammulina velutipes*	Physalacriaceae	Edible
7	*Ganoderma lucidum*	Ganodermataceae	Medicinal
8	*Grifola frondosa*	Meripilaceae	Edible
9	*Hericium erinaceus*	Hericiaceae	Edible
10	*Inonotus obliquus*	Hymenochaetaceae	Medicinal
11	*Lactarius sp.*	Russulaceae	Edible
12	*Lentinus sp.*	Polyporaceae	Edible

13	*Lentinula edode*	Marasmiaceae	Edible
14	*Lentis spp*	Polyporaceae	Medicinal
15	*Microporus xanthopus*	Polyporaceae	Medicinal
16	*Piptoporus betulinus*	Fomitopsidaceae	Edible
17	*Pleurotus eryngii*	Pleurotaceae	Edible
18	*Pleurotus ostreatus*	Pleurotaceae	Edible
19	*Polyporus umbellatus*	Thelephoraceae	Edible
20	*Termitomyces microcarpa*	Lyophyllaceae	Edible
21	*Termitomyces eurhizus*	Lyophyllaceae	Edible
22	*Termitomyces clypeatus*	Lyophyllaceae	Edible
23	*Termitomyces heimii*	Lyophyllaceae	Edible
24	*Trametes versicolor*	Polyporaceae	Medicinal

NTFPs (other than Medicinal Plants) used locally and for commercially use

S. No.	Local Name	Scientific Name	Remarks
1	Kalmisak	*Ipomoea aquatica*	Leaves used as a vegetable
2	Maan Kochu	*Colocasia esculenta*	Tubers used as food
3	Lal shak	*Amaranthus spp.*	Leaves and stem used as vegetable
4	Deki shak	*Diplazium polypoides*	Fronds and shoots as vegetable
5	Bans kurul	*Bamboo shoots (various spp)*	Shoots used as vegetable, condiment and for making pickle
6	Ban Alu (yam)	*Dioscorea spp.*	Tubers/ rhizome used as food
7	Batama	*Amorphophallus spp.*	do
8	Jal kochu	*Colocasia spp.*	do
9	Gandhaki	*Homalomena aromatica*	Stem, tuber used as food
10	Ram kala	*Musa acuminata*	Fruit (banana) is consumed
11	Thor kala	*M. paradisiaca*	
12	Bak phul	*Sesbania grandiflora*	Buds/ Influ
13	Chalta	*Dillenia indica*	do
14	Brehanti	*Solanum torvum*	Fruit/seed is edible
15	Putki begun	*Solanum nigrum*	do
16	Tela kachu	*Coccinia grandiflora*	do
17	Kao	*Garcinia cowa*	Fruit is consumed
18	Jalpui	*Elaeocarpus floribundus*	do
19	Anarosh	*Ananus comusus*	do
20	Damur	*Ficus hispida*	do
21	Chamal	*Artocarpus chaplasha*	do
22	Amloki	*Emblica officinalis*	Fruit is edible
23	Bana hallud	*Curcuma aromatica*	Spice/condiment(rhizome)
24	Sinjhu	*Ocimum americanum*	do (leaves)
25	Banta	*O. bassilicum*	do (leaves)
26	Ban tejpata	*Cinnamomum obtusifolium*	do (leaves)
27	Payesh pata	Pandanus minor	do (leaves)
28	Tetul	*Tamarindus indica*	Fruits and leaves

29	Bamboo (Bansh)	*Bambusa balccoa, B. tulda, B. polymorpha etc.*	Used as post, for walls; handicrafts; agriculture.
30	Cane (Bent)	*Calamus rotung, C. viminalis.*	For building and implements; handicrafts,
31	Dhup	*Canarium strictum*	Mosquito repellent, Religious functions
32	Grass – Chhan	*Imperatus cylindrica*	For roofing and as shafts
33	Grass – Kush	*Eragrostic cynosoroides*	
34	Leaves (esp kacuri pana)	*Eichhornia crassipes, Pistia spp. Dalbergia spp.*	For making compost
35	Bamboo	*Melocanna baccifera*	Fencing material, young shoot as food
36	Rifuji Lata	*Mikania cordata*	Forage/fodder
37	Ghash	*Crysopogogon aciculatus*	Fodder grass
38	Mehendi	*Lawsonia inermis*	For colouring/ dying
39	Haritaki	*Terminalia chebula*	Fruit used in tanning
40	Udal	*Sterculia villosa*	Fiber- yielding
41	Pichla	*Microcos paniculata*	do
42	Simul	*Bombax ceiba*	Silk cotton; fiber
43	(Several)	*Allophulus cobe, Datura stramonium, Hollarhena antidysentrica, Mucuna nigricans, etc.*	As nacrotics, insecticides,and poison
44	(Several)	*Abrus precatorius, Lygodium flexiosus, L. japonica, Adiantum caudatum, etc.*	For decorative purposes
45	NA	*Streblus asper*	Fisheries application
46	Bel, Grass, Tulsi	*Aegle marmelos, Ficus religiosa, Cynodon dactylon,*	Fruit/leaves/grass used for religious purposes. Bel fruit pulp is eaten
47	Bana hallud	*Curcuma aromatica*	Spice/condiment(rhizome)

List of fishes found in study site.

SL NO.	Scientific name	Common Name	Family
1	*Amblyceps mangois (Hamilton)*		Amblycipitidae
2	*Amphipnous cuchia*	Kuchia	Amphipnoidae
3	*Alpocheilus panchax*	Chokhoni	Amphipnoidae
4	*Alpocheilus melastigma*	Chokhoni	Amphipnoidae
5	*Anabas testudineus (Bloch)*	Koi	Anabantidae
6	*Colisa fasciata (Schneider)*	Kolisha	Anabantidae/ Belontidae
7	*Rita rita (Hamilton)*	Reti	Bagridae
8	*Batasio batasio (Hamilton)*		Bagridae
9	*Mystus bleekeri (Day)*	Tengra	Bagridae
10	*Mystus cavasius (Hamilton)*		Bagridae
11	*Mystus vittatus (Bloch)*	Tengara	Bagridae

12	*Aoricbtbys aor (Hamilton)*		Bagridae
13	*Aorichthys seenghala (Sykes)*	Aoyeer	Bagridae
14	*Xenentodon cancila (Hamilton)*	Kakiya	Belonidae
15	*Chaca chaca*	Kutkutya	Chacidae
16	*Chanda baculis (Hamilton)*		Chandidae
17	*Chanda nama Hamilton*		Chandidae
18	*Chanda ranga Hamilton*		Channidae
19	*Channa barea (Hamilton)*		Channidae
20	*Channa marulius*	Gajar	Channidae
21	*Channa orientalis (Schneider)*	Cheng	Channidae
22	*Channa punctatus (Bloch)*	Lati/ Taki	Channidae
23	*Channa striatus (Bloch)*	Shoal	Channidae
24	*Clarias batrachus (Linnaeus)*	Jagur/ Magur	Clariidae
25	*Noemacheilus botia (Hamilton)*		Cobitidae
26	*Neomacheilus spilopterus*		Cobitidae
27	*Neomacheilus zonatus*		Cobitidae
28	*Botia rostrata (Giinther)*		Cobitidae
29	*Somileptes gongota (Hamilton)*		Cobitidae
30	*Lepidocephalus guntea (Hamilton)*		Cobitidae
31	*Lepidocephailis berdmorei (Blyth)*	Gunte/ Gutam	Cobitidae
32	*Chela labuca Hamilton*	Chapkhowari.	Cyprinidae
33	*Salmostoma bacaila*	Chela	Cyprinidae
34	*Salmostoma clopeoides (Bloch)*	Chela	Cyprinidae
35	*Esomus danricus*		Cyprinidae
36	*Danio aequipinnatus (McClelland)*	Chebli.	Cyprinidae
37	*Danio (Brachydanio) reria (Ham)*	Anju	Cyprinidae
38	*DINio dangila (Hamilton)*	Nipati.	Cyprinidae
39	*Rasbora daniconius (Ham)*	Darkina	Cyprinidae
40	*Rasbora eiallga (Ham)*	Bhagna	Cyprinidae
41	*Amblypharyngodon mola*	Mowka	Cyprinidae
42	*Aspidoparia jaya-(Ham)*		Cyprinidae
43	*Barilius baRILA (Hamilton)*	Chedra	Cyprinidae
44	*Barilius barna (Hamilton)*	Joia, Bhola, Ghal	Cyprinidae
45	*Barilios nelsoni (Barman)*		Cyprinidae
46	*Barllios shacra (Hamilton)*	Koksha	Cyprinidae
47	*Barilius tileo (Hamilton)*	Boola	Cyprinidae
48	*Cyprinus carpio carpio Linnaeus*		Cyprinidae
49	*PuntillS clavatus (McClelland)*	Puti	Cyprinidae
50	*Puntius chola (Hamilton)*	Titu Puti	Cyprinidae
51	*Puntius conchonius (Hamilton)*	Kanchan Puti	Cyprinidae
52	*Puntius sophore (Hamilton)*	Puti/ Sar Puti	Cyprinidae
53	*Punt ius sarona sarona (Ham)*	Sar Puti	Cyprinidae
54	*Puntius licto (Ham)*	Tituputi	Cyprinidae
55	*Osteobrama cotio cotio (Hamilton)*	Gila Khani	Cyprinidae
56	*Labeo bata (Hamilton)*	Bhangna/Batta	Cyprinidae
57	*Labeo calbasu (Hamilton)*	Kalibaus	Cyprinidae
58	*Labeo gonius (Hamilton)*	Gonya	Cyprinidae

59	*Labeo rohita (Hamilton)*	Rohu/Rui	Cyprinidae
60	*Chagunius chagunio (Hamilton)*	Puti	Cyprinidae
61	*Semiplotus emiplotus (Mc Clelland)*	Bandangi'	Cyprinidae
62	*Tor putitora (Hamilton)*		Cyprinidae
63	*Tor tor (Hamilton)*	Mahasol	Cyprinidae
64	*Cirrhinus mrigala (Hamilton)*	Mrigal	Cyprinidae
65	*Cirrhinus reba (Hamilton)*	Rewah	Cyprinidae
66	*Catla catla (Hamilton)*		Cyprinidae
67	*Crossocheils latius latius (Hamilton)*		Cyprinidae
68	*Aplocheilus panchax (Hamilton)*		Cyprinodontidae
69	*Aprocryptus bato*	Cheeng	Gobidae
70	*Glossogobius gioris (Hamilton)*	Bhalia/ Belay	Gobidae
71	*Heteropneostes fossilis (Bloch)*	Singhi	Heteropneustidae
72	*M. pancalus*	Chikra Bhaim	Mastacembelidae
73	*Macrognathus aculeatus*	Bangas	Mastacembelidae
74	*Macrognathus aculeatus (Bloch)*	Goichi	Mastacembelidae
75	*MastaCembelus armatus*	Baim	Mastacembelidae
76	*Mastacembelus pancalus (Hamilton)*	Baim	Mastacembelidae
77	*Tetraodon cutcutia (Hamilton)*		Mastacembelidae
78	*Sicamugil cascasia (Hamilton)*		Mugilidae
79	*Rhinomogil corsula (Hamilton)*		Mugilidae
80	*Badis badis (Ham)*	Bot Koi	Nandidae
81	*Nandus nandus (Hamilton)*	Nanda/ Meni	Nandidae
82	*Olyra kempi (Chaudhuri)*		Olyridae
83	*Olyra longicaudata (McClell)*	Bhotsinghi	Olyridae
84	*Ompok bimaculatus (Bloch)*		Silurldae
85	*Ompok pabda (Hamilton)*		Silurldae
86	*Wallago attu (Schneider)*	Boal	Silurldae
87	*Ailia coila (Hamilton)*		Schilbeidae
88	*Pseudeotropius atherinoides (Bloch)*		Schilbeidae
89	*Clupisoma garua (Hamilton)*		Schilbeidae
90	*Clupisoma montana Hora*		Schilbeidae
91	*Eotropiichthys morius (Hamilton)*	Muribacha	Schilbeidae
92	*Eutropiicbthys vacha (Hamilton)*		Schilbeidae
93	*Silonia silondia (Hamilton)*	Shilong/Silon	Schilbeidae
94	*Bagarius bagarius (Hamilton)*	Bhaghar	Sisoridae
95	*Gagata cenia (Hamilton)*		Sisoridae
96	*Erethistoides montana montana Hora*		Sisoridae
97	*Glyptothorax conirostre*		Sisoridae
98	*Glyptothorax cavia (Ham)*		Sisoridae
99	*Glyptothorax riberoi (Hora)*		Sisoridae
100	*Glyptothorax telchitta (Ham)*		Sisoridae
101	*Hora hara (Ham)*	Gigot	Sisoridae
102	*Tetrasdon cutcutia*	Ballfish	Tetraodontidae

ANNEXURE-2

DETAILS OF PRIMARY DATA COLLECTED

Herb Species observed in the nearby markets

S NO	*Species Name*	Common/ Local Name	Family	Parts used	Uses
1.	*Amaranthus gracilis* Desf.	Maira	Amaranthaceae	S, L	Vegetables
2.	*Amaranthus spinosus* L.	Danta Maira	Amaranthaceae	S, L	Vegetables
3.	*Amaranthus viridis* L.	Maira Anuwai	Amaranthaceae	S, L	Vegetables
4.	*Chenopodium album*	Bathua Saagh	Amaranthaceae	S, L	Vegetables
5.	*Allium cepa*	Piyas	Amaryllidaceae	B	Spice
6.	*Allium sativum*	Risum	Amaryllidaceae	CL	Spice, Flavour
7.	*Centilla asiatica*	Samsota	Apiaceae	S, L	Vegetables
8.	*Eryngium foetidum* L.	Bilati bakhor,	Apiaceae (Umbelliferae)	SH, L	Flavour
9.	*Alocasia cucullata*	Biskochu	Araceae	S, R	Vegetables
10.	*Alocasia indica*	Muitu kotor	Araceae	S, R, ST, F	Vegetables
11.	*Alocasia macrorrhiza*	Borkochu	Araceae	S, R	Vegetables
12.	*Amorphophallus bulbifer*	Mui-morong, Batema	Araceae	S, B	Vegetables
13.	*Colacasia esculenta*	Muitu, Dalkochu, Arvi	Araceae	S, R, F, ST	Vegetables
14.	*Colocasia gigantea*	Manai	Araceae	S	Vegetables
15.	*Homalomena aromatica*	Gandrwi, Kamaitru	Araceae	S, R	Vegetables, Medicinal
16.	*Lasia spinosa*	Gantha	Araceae	S, R	Vegetables
17.	*Acmella oleracea* L	Oosundui	Asteraceae	S, L, F	Vegetables, Flavour
18.	*Blumea lanceolaria* (Roxb.) Druce	Barmajhal	Asteraceae (Compositae)	L, SH	Vegetables, Flavour
19.	*Enhydra fluctuans* Lour.	Titiduga	Asteraceae (Compositae)	SH	Vegetables
20.	*Spilanthes acmella* (L.) Murray.	Hukni Ousundwi	Asteraceae (Compositae)	S, L, F	Vegetables, Flavour
21.	*Spilanthes paniculata* Wall. ex DC.	Ousundwi	Asteraceae (Compositae)	S, L, F	Vegetables, Flavour
22.	*Diplazium esculentum* (Retz.) Sw.	Muikoitroi, Muikhunchok, Mui khonte	Athyriaceae	SH	Vegetables
23.	*Basella alba*	Muiphrai, Malabar Spinach	Basellaceae	L, SH, F, FR	Vegetables
24.	*Brassica nigra*	Hoiro, Black Mustard	Brassicaceae	SH, L	Vegetables
25.	*Brassica oleracea* var.	Banda Kopi	Brassicaceae	F	Vegetables

	capitata				
26.	*Brassica oleracea* var. botrytis	Phul kopi	Brassicaceae	F	Vegetables
27.	*Raphanus sativus* (L.) Domin	Mulai, Radish	Brassicaceae	WP	Vegetables
28.	*Ananas comosus*	Omotwi	Bromeliaceae	F	Fruit Eaten
29.	*Polycarpon prostratum* (Forssk.) Aschers & Schweinf.	Bukhate, Jhima	Caryophyllaceae	S, SH, L	Vegetables
30.	*Spinacia oleracea* L.	Palak	Chenopodiaceae	L	Vegetables
31.	*Commelina paludosa*	Toling Yasku	Commelinaceae	SH	Vegetables
32.	*Benincasa hispida* (Thunb.) Cogn.	Khaklu	Cucurbitaceae	S, L, F, FR	Vegetables
33.	*Citrullus lanatus* (Thunb.) Mansf.	Mukfal	Cucurbitaceae	FR	Fruit Eaten
34.	*Coccinia grandis*	Potol, Ivy Gourd	Cucurbitaceae	F	Vegetables
35.	*Gymnopetalum cochinchinensis* (Lour.) Kurz	Potol Kamranga	Cucurbitaceae	F	Vegetables
36.	*Cucumis melo* L	Thaisumu	Cucurbitaceae	F	Fruit & Vegetables
37.	*Cucumis sativus* L.	Sosa	Cucurbitaceae	F	
38.	*Cucurbita maxima* Duch.	Chakumura Kepher	Cucurbitaceae	S, L, SH, F, FR	Vegetables
39.	*Cucurbita moschata* (Duch.) Poir.	Chakumura kolok	Cucurbitaceae	S, L, SH, F, FR	Vegetables
40.	*Lagenaria siceraria* (Molina) Standley	Muilok, Tilok	Cucurbitaceae	S, L, SH, F, FR	Vegetables
41.	*Luffa acutangula* (L.) Roxb.	Zinga	Cucurbitaceae	SH, FR	Vegetables
42.	*Luffa cylindrica or Luffa aegyptiaca*	Phoro, Pholo	Cucurbitaceae	SH, FR	Vegetables
43.	*Momordica charantia* L.	Gangla	Cucurbitaceae	SH, FR	Vegetables
44.	*Momordica cochinchinensis* (Lour.) Spreng.	Khetoni kangro	Cucurbitaceae	FR	Vegetables
45.	*Momordica dioica* Roxb. ex Willd.	Bolongni Kangro	Cucurbitaceae	FR	Vegetables
46.	*Thladiantha calcarata* C.B. Clarke	Samprama	Cucurbitaceae	SH	Vegetables
47.	*Trichosanthes anguina* L.	Puitha	Cucurbitaceae	FR	Vegetables
48.	*Dioscorea alata*	Tha Kwchak, Purple Yam	Dioscoreaceae	T	Vegetables

49.	*Dioscorea hamiltonii* Hook.f.	Tha-kun	Dioscoreaceae	T	Vegetables
50.	*Dioscorea glabra* Roxb.	Susungra	Dioscoreaceae	T	Vegetables
51.	*Dioscorea villosa*	Tha Bolong	Dioscoreaceae	T	Vegetables
52.	*Dioscorea deltoidea*		Dioscoreaceae	T	Vegetables
53.	*Arachis hypogaea* L.	Badam,	Fabaceae (Papilionaceae)	SD	Eaten
54.	*Canavalia gladiata*	Baikang	Fabaceae (Papilionaceae)	FR	Vegetables
55.	*Dolichos lablab* L.	Masingni Kosoi, Winter beans	Fabaceae	L, FR	Vegetables
56.	*Psophocarpus tetragonolobus* (L.) DC.	Kamranga kosoi	Fabaceae	FR	Vegetables
57.	*Vigna unguiculata (L.)* Walp.	Subai	Fabaceae	FR, SD	Vegetables
58.	*Elsholtzia blanda Benth. / Elsholtzia griffithii*	Muilok banda	Lamiaceae	L, SH	Vegetables, Flavour
59.	*Ocimum basilicum* L	Banda	Lamiaceae (Labiatae)	L, SH	Medicinal
60.	*Aloe barbadensis*	Aloe vera	Liliaceae	L	Medicinal
61.	*Abelmoschus manihot* (L.)	Sikam Muirimi	Malvaceae	FR	Vegetables
62.	*Corchorus capsularis*	Pat, Jute	Malvaceae	S	Fibre
63.	*Hibiscus sabdariffa* L.	Khuni-mukhui, Anthur	Malvaceae	SH, FR	Vegetables
64.	*Phrynium pubinerve*	Lairu	Marantaceae	L, SH	Vegetables
65.	*Musa paradasiaca*	Thailik	Musaceae	S, F, FR	Fruit & Vegetables
66.	*Musa balbisiana*	Bolong thailik (Tangpui)	Musaceae	S, F, FR	Fruit & Vegetables
67.	*Nymphaea nouchali Burm.f*	Sampla bokong	Nymphaeaceae	S	Vegetables
68.	*Sesamum indicum* L.	Siping	Pedaliaceae	SD	Vegetables & Spice
69.	*Piper betel* L.	Phatwi	Piperaceae	L	Eaten
70.	*Piper nigrum* L.	Gulmorich	Piperaceae	SD	Spice
71.	*Cymbopogan citratus*	Soingmandar	Poaceae	L	Tea, Scent
72.	*Imperata cylindrica* (L.) Raeusch.	Soin	Poaceae	L	Roof making
73.	*Thysanolaena latifolia*	Noksi	Poaceae	SH	Broom
74.	*Saccharum officinarum*	Sugarcane, Kwruk	Poaceae	S	Eaten
75.	*Zea mays*	Moka, Mokadam	Poaceae	FR	Vegetables, Popcorn
76.	*Monochoria vaginalis* (Burm. F.)	Chichiri, Kechurwi	Pontederiaceae	SH	Vegetables

77.	*Monochoria hastate*	Chichiri, Kechurwi	Pontederiaceae	SH	Vegetables
78.	*Capsicum annuum* L.	Thamso	Solanaceae	FR	Spice
79.	*Solanum lycopersicum*	Tomato	Solanaceae	FR	Vegetables
80.	*Solanum melongena* L.	Phantok, Brinjal	Solanaceae	FR	Vegetables
81.	*Solanum tuberosum*	Aloo	Solanaceae	T	Vegetables
82.	*Alpinia allughas*	Therai	Zingiberaceae	S	Vegetables
83.	*Alpinia malaccensis* (Burm.f.) Rosc.	Biring	Zingiberaceae	S	Vegetables
84.	*Curcuma domestica/ Curcuma longa*	Sotwi, Kormo	Zingiberaceae	WP	Vegetables, Medicinal, Spice
85.	*Curcuma amada*	Bolongni Sortwi Bubar	Zingiberaceae	WP	Vegetables, Medicinal, Spice
86.	*Etlingera linguiformis*	Biring	Zingiberaceae	S	Vegetables
87.	*Zingiber officinale*	Haiching, Ginger	Zingiberaceae	WP	Vegetables, Medicinal, Spice

Note:

B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber, WP = Whole Plant

Shrub species observed in the nearby markets

S NO	Name of species	Common/ Local Name	Family	Part used	Uses
1.	*Ananas comosus*	Omotwi	Bromeliaceae	F	Fruit eaten
2.	*Manihot esculenta*	Thaborchuk	Euphorbiaceae	R	Vegetables, Eaten boiled
3.	*Acacia pennata*	Muikambuk	Fabaceae (Mimosaceae)	SH	Vegetables
4.	*Caesalpinia pulcherrima* L.	Krishna Chora	Fabaceae (Mimosaceae)	F	Ornamental
5.	*Cajanus cajan*	Khokleng	Fabaceae (Papilionaceae)	FR, SD	Vegetables
6.	*Gossypium arboreum* L.	Khul	Malvaceae	FR	Cotton
7.	*Gossypium hirsutum* L.	Khul	Malvaceae	FR	Cotton
8.	*Bambusa balcooa*	Washur, Barak	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
9.	*Bambusa bambos*	Washur busu, Kanta barak	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
10.	*Bambusa polymorpha*	Parwa	Poaceae	SH, S,	Vegetables, Construction,

				RZ	Handicraft
11.	*Bambusa tulda*	Wandal	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
12.	*Dendrocalamus longispathus*	Wamilik	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
13.	*Melocanna bacifera*	Wathwi, Muli	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
14.	*Schizostachyum dullooa*	Watlok Dulu	Poaceae	SH, S, RZ	Vegetables, Construction, Weaving, Handicraft
15.	*Calamus leptospadix*	Rai	Palmae (Arecaceae)	S	Fibre, Handicraft
16.	*Calamus heteracanthus*	Rai	Palmae (Arecaceae)	S	Fibre, Handicraft
17.	*Ziziphus oenoplia* (L.) Miller.	Boroi	Rhamnaceae	FR	Eaten
18.	*Citrus × limon*	Lemon	Rutaceae	FR, L	Juice, Flavour
19.	*Solanum aethiopicum*	Sikam Khamkha	Solanaceae	FR	Vegetables
20.	*Solanum torvum*	Khamkha	Solanaceae	FR	Vegetables
21.	*Solanum indicum*	Khamkha	Solanaceae	FR	Vegetables

Note:

B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber, WP = Whole Plant

Tree species observed in the nearby Markets

S NO	Name of the species	Common/ Local Name	Family	Part used	Uses
1.	*Mangifera indica*	Thaichuk	Anacardiaceae	FR	Fruit eaten, Pickle
2.	*Spondias pinnata*	Thaistwi	Anacardiaceae	FR	Fruit eaten, Pickle
3.	*Spondius dulcis*	Aamra	Anacardiaceae	FR	Fruit eaten, Pickle
4.	*Trevesia palmata* Roxb.	Chapok	Araliaceae	F, FR	Vegetables
5.	*Oroxylum indicum* L.	Tokharung	Bignoniaceae	FR	Vegetables
6.	*Protium serratum* (Wall. ex Colebr.) Engl.	Thaisrem	Burseraceae	FR	Fruit eaten
7.	*Carica papaya* L.	Kokiya, Kengkiya	Caricaceae	FR	Fruit eaten
8.	*Garcinia cowa* Roxb.	Kok, Akau	Clusiaceae	FR	Fruit eaten
9.	*Terminalia chebula* Retz.	Bakhla	Combretaceae	FR	Fruit eaten, Medicinal
10.	*Dillenia indica*	Thaiplo	Dilleniaceae	FR	Fruit eaten, Pickle
11.	*Dillenia pentagyna*	Mandul buthai	Dilleniaceae	FR	Fruit eaten

12.	*Elaeocarpus serratus*	Jolpui	Elaeocarpaceae	FR	Fruit eaten, Pickle
13.	*Parkia speciosa*	Waikre	Fabaceae	FR	Vegetables
14.	*Sesbania grandiflora* (L.) Poiret	Bokul	Fabaceae	F	Vegetables
15.	*Tamarindus indica*	Thentrwi, Tamarind	Fabaceae	FR	Fruit eaten
16.	*Artocarpus heterophyllus*	Thaipong	Moraceae	FR	Vegetables, Ripe Fruit eaten
17.	*Ficus semicordata*	Khuichang	Moraceae	FR	Ripe Fruit eaten
18.	*Moringa oleifera*	Sejna	Moringaceae	FR, F, L	*Vegetables*
19.	*Psidium guajava*	Goyam	Myrtaceae	FR	Fruit eaten
20.	*Syzygium cuminii*	Jam	Myrtaceae	FR, S	Ripe Fruit eaten, Timber, Fire wood
21.	*Averrhoa carambola* L.	Kamranga	Oxalidaceae	FR	Fruit eaten
22.	*Areca catechu*	Kuwai	Palmae (Arecaceae)	FR	Fruit eaten
23.	*Cocos nucifera*	Narikra	Palmae (Arecaceae)	FR	Fruit eaten
24.	*Phyllanthus acidus* L.	Al Boroi, Leheri,	Phyllanthaceae	FR	Fruit eaten
25.	*Phyllanthus emblica* L.	Amlai	Phyllanthaceae	FR	Fruit eaten
26.	*Ziziphus jujuba*	Boroi	Rhamnaceae	FR	Fruit eaten
27.	*Ziziphus mauritiana* Lamk.	Boroi	Rhamnaceae	FR	Fruit eaten
28.	*Citrus x sinensis*	Komla	Rutaceae	FR	Fruit eaten
29.	*Aegle marmelos*	Bel	Rutaceae	FR	Fruit eaten
30.	*Citrus maxima*	Jambora	Rutaceae	FR	Fruit eaten
31.	*Zanthoxylum panamense*	Muicheng	Rutaceae	L	Vegetables, Flavour

Note:

B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber, WP = Whole Plant

Herb Species reported to be collected by villagers from forest

S NO	**Species Name**	**Common/ Local Name**	**Family**	**Parts used**	**Uses**
1	*Amaranthus spinosus* L.	Danta Maira	Amaranthaceae	S, L	Vegetables
2	*Amaranthus viridis* L.	Maira Anuwai	Amaranthaceae	S, L	Vegetables
3	*Chenopodium album*	bathua or bathuwa	Amaranthaceae	S, L	Vegetables
4	*Centilla asiatica*	Samsota	Apiaceae	S, L	Vegetables
5	*Alocasia cucullata*	Biskochu	Araceae	S, R	Vegetables
6	*Alocasia indica*	Muitu kotor	Araceae	S, R, ST, F	Vegetables

7	*Amorphophallus bulbifer*	Mui-morong, Batema	Araceae	S, B	Vegetables
8	*Colacasia esculenta*	Muitu, Dalkochu, Arvi	Araceae	S, R, F, ST	Vegetables
9	*Homalomena aromatica*	Gandrwi, Kamaitru	Araceae	S, R	Vegetables, Medicinal
10	*Acmella oleracea* L	Osundui	Asteraceae	S, L, F	Vegetables, Flavour
11	*Blumea lanceolaria* (Roxb.) Druce	Barmajhal	Asteraceae (Compositae)	L, SH	Vegetables, Flavour
12	*Enhydra fluctuans* Lour.	Titiduga	Asteraceae (Compositae)	SH	Vegetables
13	*Eupatorium triplinerve* Vahl.	Sogorem kwchak	Asteraceae (Compositae)	L, SH	Medicinal
14	*Spilanthes acmella* (L.) Murray.	Hukni Ousundwi	Asteraceae (Compositae)	S, L, F	Vegetables, Flavour
15	*Spilanthes paniculata* Wall. ex DC.	Osundwi	Asteraceae (Compositae)	S, L, F	Vegetables, Flavour
16	*Spilanthes radicans*	Osundwi Kuphur	Asteraceae (Compositae)	S, L, F	Vegetables, Flavour
17	*Diplazium esculentum* (Retz.) Sw.	Muikoitroi, Muikhunchok, Mui khonte	Athyriaceae	SH	Vegetables
18	*Polycarpon prostratum* (Forssk.) Aschers & Schweinf.	Bukhate, Jhima	Caryophyllaceae	S, SH, L	Vegetables
19	*Commelina paludosa*	Toling Yasku	Commelinaceae	SH	Vegetables
20	*Cuscuta reflexa* Roxb.	Swarnolota	Convolvulaceae	SH, L	Vegetables
21	*Coccinia grandis*	Potol, Ivy Gourd	Cucurbitaceae	F	Vegetables
22	*Gymnopetalum cochinchinensis* (Lour.) Kurz	Potol Kamranga	Cucurbitaceae	F	Vegetables
23	*Luffa cylindrica or Luffa aegyptiaca*	Phoro, Pholo	Cucurbitaceae	SH, FR	Vegetables
24	*Momordica dioica* Roxb. ex Willd.	Bolongni Kangro	Cucurbitaceae	FR	Vegetables
25	*Thladiantha calcarata* C.B. Clarke	Samprama	Cucurbitaceae	SH	Vegetables
26	*Dioscorea hamiltonii* Hook.f.	(Tha-kun)	Dioscoreaceae	T	Vegetables
27	*Dioscorea glabra* Roxb.	(Susungra)	Dioscoreaceae	T	Vegetables
28	*Dioscorea villosa*	Tha Bolong	Dioscoreaceae	T	Vegetables
29	*Dioscorea deltoidea*	Tha	Dioscoreaceae	T	Vegetables
30	*Bauccauria ramiflora* Lour	Kusumai	Euphorbiaceae	F	Fruit
31	*Ocimum tenuiflorum Ocimum sanctum*	Tulsi	Lamiaceae (Labiatae)	L, SH	Medicinal

32	*Phrynium pubinerve*	Lairu	Marantaceae	L, SH	Vegetables
33	*Tinospora cordifolia*	Bduboyeih, Dumakme, Duksa songdari	Menispermaceae	S	Medicinal
34	*Musa balbisiana*	Bolong thailik (Tangpui)	Musaceae	S, F, FR	Fruit & Vegetables
35	*Boerhavia diffusa* L.	Punarnava	Nyctaginaceae	L, SH	Vegetables
36	*Nymphaea nouchali* Burm.f	Sampla	Nymphaeaceae	S	Vegetables
37	*Passiflora foetida*	B'Duk Thaitop	Passifloraceae	FR	Fruit
38	*Imperata cylindrica* (L.) Raeusch.	Soin,	Poaceae	L	House Construction
39	*Thysanolaena latifolia*	Noksi	Poaceae	SH	Broom
40	*Monochoria vaginalis* (Burm. F.)	Chichiri, Kechurwi	Pontederiaceae	SH	Vegetables
41	*Monochoria hastate*	Chichiri, Kechurwi	Pontederiaceae	SH	Vegetables
42	*Physalis minima*	Thaitop	Solanaceae	FR	Fruit
43	*Alpinia allughas (nigra)*	Therai	Zingiberaceae	S	Vegetables
44	*Alpinia malaccensis* (Burm.f.) Rosc.	Biring	Zingiberaceae	S	Vegetables
45	*Curcuma amada*	Bolongni Sortwi (Bubar Gulapi)	Zingiberaceae	WP	Vegetables, Medicinal, Spice
46	*Curcuma zedoaria*	Sotwi gulapi	Zingiberaceae	WP	Vegetables, Medicinal, Spice
47	*Etlingera linguiformis*	Biring	Zingiberaceae	S	Vegetables

Note:

Note:

B = Bulb, BK = Bark, F = Flower, FR = Fruit, L = Leaf, R = Root, RZ = Rhizome, S = Stem, SD = Seed, SH = Shoot, ST = Stolon, T = Tuber, WP = Whole Plant

Shrub species reported to be collected by villagers from forest

S NO	Name of species	Common/ Local Name	Family	Part used	Uses
22.	*Cassia occidentalis*	Muitati	Fabaceae	L, SH	Vegetables
23.	*Calamus leptospadix*	Rai	Palmae (Arecaceae)	S	Fibre, Handicraft
24.	*Calamus heteracanthus*	Rai	Palmae (Arecaceae)	S	Fibre, Handicraft
25.	*Bambusa tulda*	Wandal	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
26.	*Dendrocalamus longispathus*	Wamilik	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft

27.	*Melocanna bacifera*	Wathwi	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
28.	*Schizostachyum dullooa*	Watlok Dulu	Poaceae	SH, S, RZ	Vegetables, Construction, Weaving, Handicraft
29.	*Ziziphus oenoplia* (L.) Miller.	Boroi	Rhamnaceae	FR	Eaten
30.	*Solanum torvum*	Khamkha	Solanaceae	FR	Vegetables
31.	*Solanum indicum*	Khamkha	*Solanaceae*	FR	Vegetables

Note:

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Tree species reported to be collected by villagers from forest

S NO	Name of the species	Common/ Local Name	Family	Part used	Uses
1	*Spondias pinnata*	Thaistwi	Anacardiaceae	FR	Fruit eaten, Pickle
2	*Trevesia palmata* Roxb.	Chapok	Araliaceae	F, FR	Vegetables
3	*Oroxylum indicum* L.	Tokharung	Bignoniaceae	FR	Vegetables
4	*Bombax ceiba*	Borchuk Tula	Bombacaceae	F, FR	Vegetables, Cotton
5	*Protium serratum* (Wall. ex Colebr.) Engl.	Thaisrem	Burseraceae	FR	Fruit eaten
6	*Garcinia cowa* Roxb.	Kok, Akau	Clusiaceae	FR	Fruit eaten
7	*Terminalia bellirica*	Dedaluk, Dedagui	Combretaceae	FR	Fruit eaten, Medicinal
8	*Terminalia chebula* Retz.	Bakhla	Combretaceae	FR	Fruit eaten, Medicinal
9	*Dillenia indica*	Thaiplo	Dilleniaceae	FR	Fruit eaten, Pickle
10	*Dillenia pentagyna*	Mandul bphang	Dilleniaceae	FR	Fruit eaten
11	*Macaranga peltata* Roxb. Mueller.	Laichak, Laichrok	Euphorbiaceae	ST	Construction, Firewood
12	*Securinega virosa* (Roxb. ex Willd.) Baill.	Tokblu Khamchui	Euphorbiaceae	FR	Fruit eaten
13	*Tamarindus indica*	Thentrwi	Fabaceae	FR	Fruit eaten
14	*Tectona grandis*	Segun	Lamiaceae	S	Timber, Firewood
15	*Sterculia villosa*	Phati bwphang	Malvaceae	BR, FR	Rope making, Fruit eaten
16	*Albizia chinensis*	Bolphuk	Mimosaceae	S	Fire wood
17	*Albizia procera*	Khuri	Mimosaceae	S	Timber, Fire wood
18	*Artocarpus hirsutus*	Jram	Moraceae	FR	Ripe Fruit eaten

19	*Artocarpus lacucha*	Duwa	Moraceae	FR	Ripe Fruit eaten
20	*Ficus semicordata*	Khuichang	Moraceae	FR	Ripe Fruit eaten
21	*Syzygium cuminii*	Jam	Myrtaceae	FR, S	Ripe Fruit eaten, Timber, Fire wood
22	*Caryota mitis* Lour.	Sumal	Palmae (Arecaceae)	S	Handicraft
23	*Phoenix sylvestris*	Khajuri	Palmae (Arecaceae)	F, TW	Fruit eaten, Juice obtain from Trunk
24	*Phyllanthus emblica* L.	Amlai	Phyllanthaceae	FR	Fruit eaten
25	*Ziziphus jujuba*	Boroi	Rhamnaceae	FR	Fruit eaten
26	*Ziziphus mauritiana* Lamk.	Boroi	Rhamnaceae	FR	Fruit eaten
27	*Ficus auriculata*	Drumpui	Moraceae	FR	Fruit eaten

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Herb species reported as cultivated by locals in Jhum or Home garden

S NO	Species Name	Common/ Local Name	Family	Parts used	Uses
1	*Andrographis paniculata*	Sirota	Acanthaceae	L, SH	Medicinal
2	*Amaranthus gracilis* Desf.	Maira	Amaranthaceae	S, L	Vegetables
3	*Coriandrum sativum* L.	Bakhor, Coriander	Apiaceae	S, L, SD	Flavour
4	*Eryngium foetidum* L.	Bilati bakhor,	Apiaceae (Umbelliferae)	SH, L	Flavour
5	*Alocasia indica*	Muitu kotor	Araceae	S, R, ST, F	Vegetables
6	*Alocasia cucullata*	Biskochu	Araceae	S, R	Vegetables
7	*Alocasia macrorrhiza*	Borkochu	Araceae	S, R	Vegetables
8	*Amorphophallus bulbifer*	Mui-morong, Batema	Araceae	S, B	Vegetables
9	*Colocasia esculenta*	Muitu, Dalkochu, Arvi	Araceae	S, R, F, ST	Vegetables
10	*Colocasia gigantea*	Manai	Araceae	S	Vegetables
11	*Homalomena aromatica*	Gandrwi, Kamaitru	Araceae	S, R	Vegetables, Medicinal
12	*Lasia spinosa*	Gantha	Araceae	S, R	Vegetables
13	*Blumea lanceolaria* (Roxb.) Druce	Barmajhal	Asteraceae (Compositae)	L, SH	Vegetables, Flavour
14	*Calendula officinalis*	Sotrobongo, Marigold,	Asteraceae	F, L	Ornamental, Medicinal
15	*Eupatorium triplinerve* Vahl.	Sogorem kwchak	Asteraceae (Compositae)	L, SH	Medicinal

16	*Spilanthes acmella* (L.) Murray.	Hukni Osundwi	Asteraceae (Compositae)	S, L, F	Vegetables, Flavour
17	*Basella alba*	Muiphrai, Malabar Spinach	Basellaceae	L, SH, F, FR	Vegetables
18	*Brassica nigra*	Hoiro, Black Mustard	Brassicaceae	SH, L	Vegetables
19	*Raphanus sativus* (L.) Domin	Mulai, Radish	Brassicaceae	WP	Vegetables
20	*Ananas comosus*	Omotwi	Bromeliaceae	F	Fruit eaten
21	*Spinacia oleracea* L.	Palak	Chenopodiaceae	L	Vegetables
22	*Ipomoea batatas*	Thaktwi, Sweet Potato	Convolvulaceae	T	Vegetables
23	*Kalanchoe pinnata* (Lam.) Pers.	Basanta Pata	Crassulaceae	L	Medicinal
24	*Benincasa hispida* (Thunb.) Cogn.	Khaklu	Cucurbitaceae	S, L, F, FR	Vegetables
25	*Coccinia grandis*	Potol, Ivy Gourd	Cucurbitaceae	F	Vegetables
26	*Gymnopetalum cochinchinensis* (Lour.) Kurz	Potol Kamranga	Cucurbitaceae	F	Vegetables
27	*Cucumis melo* L	Thai sumu	Cucurbitaceae	F	Fruit & Vegetables
28	*Cucumis sativus* L.	Sosa	Cucurbitaceae	F	
29	*Cucurbita maxima* Duch.	Ckakumura Kepher	Cucurbitaceae	S, L, SH, F, FR	Vegetables
30	*Cucurbita moschata* (Duch.) Poir.	Chakumura kolok	Cucurbitaceae	S, L, SH, F, FR	Vegetables
31	*Lagenaria siceraria* (Molina) Standley	Muilok, Tilok	Cucurbitaceae	S, L, SH, F, FR	Vegetables
32	*Luffa acutangula* (L.) Roxb.	Zinga	Cucurbitaceae	SH, FR	Vegetables
33	*Luffa cylindrica or Luffa aegyptiaca*	Phoro, Pholo	Cucurbitaceae	SH, FR	Vegetables
34	*Momordica charantia* L.	Gangla	Cucurbitaceae	SH, FR	Vegetables
35	*Momordica dioica* Roxb. ex Willd.	Bolongni Kangro	Cucurbitaceae	FR	Vegetables
36	*Trichosanthes anguina* L.	Puitha	Cucurbitaceae	FR	Vegetables
37	*Dioscorea alata*	Tha Kwchak, Purple Yam	Dioscoreaceae	T	Vegetables
38	*Dioscorea hamiltonii* Hook.f.	Tha-kun	Dioscoreaceae	T	Vegetables
39	*Dioscorea villosa*	Tha Bolong	Dioscoreaceae	T	Vegetables
40	*Bauccauria ramiflora*	Kusumai	Euphorbiaceae	F	Fruit

	Lour				
41	*Canavalia gladiata*	Baikang	Fabaceae (Papilionaceae)	FR	Vegetables
42	*Dolichos lablab* L.	Masingni Kosoi, Winter beans	Fabaceae	L, FR	Vegetables
43	*Psophocarpus tetragonolobus* (L.) DC.	Kamranga kosoi	Fabaceae	FR	Vegetables
44	*Vigna unguiculata (L.)* Walp.	Subai	Fabaceae	FR, SD	Vegetables
45	*Elsholtzia griffithii*	Muilok banda	Lamiaceae	L, SH	Vegetables, Flavour
46	*Ocimum basilicum* L	Banda	Lamiaceae (Labiatae)	L, SH	Vegetables & Flavour
47	*Ocimum tenuiflorum Ocimum sanctum*	Tulsi	Lamiaceae (Labiatae)	L, SH	Medicinal
48	*Aloe barbadensis*	Aloe vera	Liliaceae	L	Medicinal
49	*Abelmoschus manihot* L.	Sikam Muirimi	Malvaceae	FR	Vegetables
50	*Corchorus capsularis*	Pat, Jute	Malvaceae	S	Fibre
51	*Hibiscus sabdariffa* L.	Khuni-mukhui, Anthur	Malvaceae	SH, FR	Vegetables
52	*Phrynium pubinerve*	Lairu	Marantaceae	L, SH	Vegetables
53	*Musa paradasiaca*	Thailik	Musaceae	S, F, FR	Fruit & Vegetables
54	*Sesamum indicum* L.	Siping	Pedaliaceae	SD	Vegetables & Spice
55	*Piper betel* L.	Phatwi	Piperaceae	L	Eaten
56	*Piper nigrum* L.	Gulmorich	Piperaceae	SD	Spice
57	*Cymbopogan citratus*	Soing mandar	Poaceae	L	Tea, Scent
58	*Saccharum officinarum*	Sugarcane, Kwruk	Poaceae	S	Eaten
59	*Zea mays*	Moka, Mokadam	Poaceae	FR	Vegetables, Popcorn
60	*Capsicum annuum* L.	Thamso, Moso, Chilli	Solanaceae	FR	Spice
61	*Solanum lycopersicum*	Tomato	Solanaceae	FR	Vegetables
62	*Solanum melongena* L.	Phantok, Brinjal	Solanaceae	FR	Vegetables
63	*Solanum tuberosum*	Aloo	Solanaceae	T	Vegetables
64	*Curcuma domestica/ Curcuma longa*	Sotwi, Kormo	Zingiberaceae	WP	Vegetables, Medicinal, Spice
65	*Zingiber officinale*	Haiching, Ginger	Zingiberaceae	WP	Vegetables, Medicinal, Spice

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Shrub Species reported as cultivated by locals in Jhum or Home garden

S NO	Name of species	Common/ Local Name	Family	Part used	Uses
1	*Cordiaeum variegatum* (L.)	Patabahar	Euphorbiaceae	F	Ornamental
2	*Manihot esculenta*	Thaborchuk	Euphorbiaceae	R	Vegetables, Eaten boiled
3	*Cassia occidentalis*	Muitati	Fabaceae	L, SH	Vegetables
4	*Acacia pennata*	Muikambuk	Fabaceae	SH	Vegetables
5	*Caesalpinia pulcherrima* L.	Krishna Chora	Fabaceae	F	Ornamental
6	*Cajanus cajan*	Khokleng	Fabaceae	FR, SD	Vegetables
7	*Gossypium arboreum* L.	Khul	Malvaceae	FR	Cotton
8	*Gossypium hirsutum* L.	Khul	Malvaceae	FR	Cotton
9	*Hibiscus rosa-sinensis* L.	Jaba	Malvaceae	F	Ornamental
10	*Bougainvillea glabra* Choicy.	Khum kagoch	Nyctaginaceae	F	Ornamental
11	*Calamus leptospadix*	Rai	Palmae	S	Fibre, Handicraft
12	*Calamus heteracanthus*	Rai	Palmae	S	Fibre, Handicraft
13	*Bambusa balcooa*	Washur, Barak	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
14	*Bambusa bambos*	Washur busu, Kanta barak	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
15	*Bambusa polymorpha*	Parwa	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
16	*Bambusa tulda*	Wandal	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
17	*Dendrocalamus longispathus*	Wamilik	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
18	*Melocanna bacifera*	Wathwi, Muli	Poaceae	SH, S, RZ	Vegetables, Construction, Handicraft
19	*Rosa indica*	Gulab	Rosaceae	F	Ornamental
20	*Ixora coccinea* L.	Dhalia	Rubiaceae	F	Ornamental
21	*Citrus × limon*	Lemon	Rutaceae	FR, L	Juice, Flavour
22	*Solanum aethiopicum*	Sikam Khamkha	Solanaceae	FR	Vegetables
23	*Solanum indicum*	Khamkha	Solanaceae	FR	Vegetables

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Tree Species reported as cultivated by locals in Jhum or Home garden

S NO	Name of the species	Common/ Local Name	Family	Part used	Uses
1	*Mangifera indica*	Thaichuk	Anacardiaceae	FR	Fruit eaten, Pickle
2	*Spondias pinnata*	Thaistwi	Anacardiaceae	FR	Fruit eaten, Pickle
3	*Spondius dulcis*	Aamra	Anacardiaceae	FR	Fruit eaten, Pickle
4	*Annona reticulata* L.	Atafol	Annonaceae	FR	Fruit eaten
5	*Annona squamosa* L	Sirphal	Annonaceae	FR	Fruit eaten
6	*Trevesia palmata* Roxb.	Chapok	Araliaceae	F, FR	Vegetables
7	*Carica papaya* L.	Kokiya, Kengkiya	Caricaceae	FR	Fruit eaten
8	*Garcinia cowa* Roxb.	Kok, Akau	Clusiaceae	FR	Fruit eaten
9	*Garcinia xanthochymus*	Yellow Mangosteen	Clusiaceae	FR	Fruit eaten, Pickle
10	*Terminalia bellirica*	Dedaluk, Dedagui	Combretaceae	FR	Fruit eaten, Medicinal
11	*Terminalia chebula* Retz.	Bakhla	Combretaceae	FR	Fruit eaten, Medicinal
12	*Dillenia indica*	Thaiplo	Dilleniaceae	FR	Fruit eaten, Pickle
13	*Diospyros malabarica* (Desr.) kostel	Gab	Ebenaceae	FR	Fruit eaten
14	*Elaeocarpus serratus*	Jolpui	Elaeocarpaceae	FR	Fruit eaten, Pickle
15	*Parkia speciosa*	Waikre	Fabaceae	FR	Vegetables
16	*Sesbania grandiflora* (L.) Poiret	Bokul	Fabaceae	F	Vegetables
17	*Tamarindus indica*	Thentrwi	Fabaceae	FR	Fruit eaten
18	*Tectona grandis*	Segun	Lamiaceae	S	Timber, Firewood
19	*Sterculia villosa*	Phati bwphang	Malvaceae	BR, FR	Rope making, Fruit eaten
20	*Albizia chinensis*	*Bolphuk*	Mimosaceae	S	Fire wood
21	*Albizia procera*	Khuri	Mimosaceae	S	Timber, Fire wood
22	*Artocarpus heterophyllus*	Thaipong	Moraceae	FR	Vegetables, Ripe Fruit eaten
23	*Hevea brasiliensis*	Rubber	Moraceae	LX, S	Rubber, Fire wood
24	*Moringa oleifera*	Sejna	*Moringaceae*	FR, F, L	*Vegetables*
25	*Psidium guajava*	Goyam	Myrtaceae	FR	Fruit eaten
26	*Syzygium cuminii*	*Jam*	Myrtaceae	FR, S	Ripe Fruit eaten, Timber, Fire

					wood
27	*Nyctanthes arbortristis* L	*Sitoli*	Oleaceae	F	Ornamental
28	*Averrhoa carambola* L.	Kamranga	Oxalidaceae	FR	Fruit eaten
29	*Areca catechu*	Kowai	Palmae (Arecaceae)	FR	Fruit eaten
30	*Cocos nucifera*	Narikra	Palmae (Arecaceae)	FR	Fruit eaten
31	*Caryota mitis* Lour.	Sumal,	Palmae (Arecaceae)	S	Handicraft
32	*Phoenix sylvestris*	Khajuri	Palmae (Arecaceae)	F, TW	Fruit eaten, Juice obtain from Trunk
33	*Phyllanthus acidus* L	Al Boroi, Leheri,	Phyllanthaceae	FR	Fruit eaten
34	*Phyllanthus emblica* L.	Amlai	Phyllanthaceae	FR	Fruit eaten
35	*Ziziphus jujuba*	Boroi	Rhamnaceae	FR	Fruit eaten
36	*Ziziphus mauritiana* Lamk.	Boroi	Rhamnaceae	FR	Fruit eaten
37	*Aegle marmelos*	Bel	Rutaceae	FR	Fruit eaten
38	*Citrus maxima*	Jambora	Rutaceae	FR	Fruit eaten
39	*Citrus x sinensis*	Komla	Rutaceae	FR	Fruit eaten
40	*Zanthoxylum panamense*	Muicheng	Rutaceae	L	Vegetables, Flavour

List of the Birds species observed during Transect Walk

S NO.	Scientific Name	Common Name
1	*Pericrocotus brevirostris*	Short-billed Minivet
2	*Psilopogon lineatus*	Lineated Barbet
3	*Pycnonotus jocosus*	Red-whiskered bulbul
4	*Black-crested bulbul*	Black-crested bulbul
5	*Brachypodius melanocephalos*	Black headed bulbul
6	*Acritillas indica*	Yellow browed bulbul
7	*Pycnonotus cafer*	Red-vented Bulbul
8	*Lonchura striata*	White-rumped Munia
9	*Spilornis cheela*	Crested Serpent Eagle
10	*Pernis ptilorhynchus*	Oriental Honey Buzzard
11	*Pandion haliaetus*	Osprey, Fish hawk
12	*Accipiter badius*	Shikra
13	*Merops pusillus*	Little Bee-eater
14	*Merops orientalis*	Little Green Bee-Eater
15	*Merops leschenaulti*	Chestnut headed Bee-eater
16	*Spilopelia chinensis*	Spotted Dove
17	*Treron bicinctus*	Orange-breasted Green Pigeon
18	*Chalcophaps indica*	Emerald Dove
19	*Streptopelia tranquebarica*	Red Collared Dove

20	*Ducula aenea*	Green Imperial pigeon
21	*Columba livia*	Rock Dove
22	*Bubulcus ibis*	Indian Pond Heron
23	*Gracupica contra*	Asian pied starling / Pied Myna
24	*Dicrurus leucophaeus*	Ashy Drongo
25	*Dicrurus macrocercus*	Black Drongo
26	*Coracina caesia*	Cuckooshrike/babbler
27	*Psittacula alexandri*	Red-breasted parakeet
28	*Halcyon smyrnensis*	White-throated Kingfisher
29	*Glaucidium cuculoides*	Asian Barred Owlet
30	*Acridotheres tristis*	Common Myna
31	*Acridotheres fuscus*	Jungle Myna
32	*Gracula religiosa*	Hill Myna
33	*Eudynamys scolopaceus*	Asian koel
34	*Dumetia hyperythra*	Tawny-bellied Babbler
35	*Anastomus oscitans*	Asian Openbill Stork
36	*Microcarbo niger*	Little cormorant
37	*Artamus fuscus*	Ashy Woodswallow
38	*Upupa epops*	Common Hoopoe
39	*Chrysocolaptes lucidus*	Greater Flame-backed Woodpecker
40	*Chrysophlegma flavinucha*	Greater Yellow-naped Woodpecker
41	*Bubulcus ibis*	Cattle Egret
42	*Ardea alba*	Great White Egret
43	*Centropus sinensis*	Greater Coucal
44	*Orthotomus sutorius*	Common Tailorbird
45	*Gallus gallus*	Red Junglefowl
46	*Psilopogon asiaticus*	Blue-throated Barbet
47	*Lanius cristatus*	Brown Shrike
48	*Lanius tephronotus*	Grey Backed Shrike
49	*Lanius collurio*	Red backed shrike
50	*Lanius schach*	*Long tailed Shrike*
51	*Sturnia malabarica*	Chestnut-tailed Starling
52	*Oriolus tenuirostris*	Black hooded Oriole
53	*Vanellus indicus*	Red-wattled Lapwing
54	*Hemiprocne coronata*	Crested Treeswift
55	*Coracias benghalensis*	Indian Roller
56	*Coracias affinis*	Indo-Chinese Roller
57	*Eurystomus orientalis*	Dollarbird
58	*Chloropsis aurifrons*	Golden-fronted Leafbird/ Jerdon's Leaf birds
59	*Pericrocotus cinnamomeus*	Small Minivet
60	*Pericrocotus solaris*	Grey-chinned Minivet
61	*Eumyias thalassinus*	Asian Verditer Flycatcher
62	*Copsychus saularis*	Oriental Magpie Robin
63	*Saxicola caprata*	Pied Bush Chat
64	*Motacilla citreola*	Citrine Wagtail

65	*Motacilla alba*	White Wagtail
66	*Pellorneum palustre*	Marsh Babbler
67	*Prinia inornata*	Plain Prinia
68	*Dendrocitta vagabunda*	Rufous treepie
69	*Dicrurus paradiseus*	Greater racket tail Drungo
70	*Dicrurus hottentottus*	Hair crested Drungo
71	*Arachnothera longirostra*	Little Spiderhunter
72	*Prinia flaviventris*	Yellow-bellied Prinia
73	*Ardea purpurea*	Purple Heron
74	*Dendrocygna javanica*	Lesser Whistling Duck