



Implemented by
giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

On behalf of:
 Federal Ministry for the
Environment, Nature Conservation
and Nuclear Safety
of the Federal Republic of Germany

REPORT ON

ASSESSMENT OF FRESHWATER AQUATIC RESOURCES AND PREPARATION OF PEOPLE'S BIODIVERSITY REGISTER (PBR)

◆ CONTRACT NO : 83412868 ◆

FUNDED BY :

**DEUTSCHE GESELLSCHAFT FÜR INTERNATIONALE
ZUSAMMENARBEIT (GIZ) GmbH**

IMPLEMENTED & SUBMITTED BY :

NAGALAND STATE BIODIVERSITY BOARD (NSBB)

1 JULY, 2022 - 30 JUNE, 2023



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On behalf of the Nagaland State Biodiversity Board (NSBB), I would like to thank the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), GmbH for funding the Contract No. 83412868 "Assessment of Freshwater Aquatic Resources and preparation of People's Biodiversity Register (PBR)" under the Project "Protection and Sustainable Management of Aquatic Resources in the Northeastern Himalayan Region of India (NERAQ Project)". This work was successfully carried out at 12 (Twelve) Villages viz., Chakhabama/Sakhabama, Jakhama, Kezo Basa, Kezoma, Khuzama, Kidima, Kigwema, Mima, Mitelephe, Pfuchama, Phesama and Viswema settled at the foothills of the Japfü Range, in the Southern Angami Region located South of Kohima, the capital of Nagaland for the period of 1(one) year from July 2022 to June 2023.

I would like to express my profound gratitude and acknowledge the following persons for rendering their best services during the course of the work, without whom this work would not have been a success:

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3. Chairperson, Secretary and all BMC members.
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5. Local Field Guides from various Southern Angami villages.
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8. All individuals who have contributed towards the success of this work.

(Mr. Supongnukshi Ao, IFS)
Member Secretary
Nagaland State Biodiversity Board

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ABSTRACT

The Assessment of freshwater aquatic resources and preparation of People's Biodiversity Register (PBR) was conducted under the Indo-German bilateral project "Protection and Sustainable Management of Aquatic Resources in the Northeastern Himalayan Region of India (NERAQ Project)". It focuses on the preliminary quantitative assessment of the freshwater aquatic resources available at 12 (twelve) Villages viz., Chakhabama/Sakhabama, Jakhama, Kezo Basa, Kezoma, Khuzama, Kidima, Kigwema, Mima, Mitelephe, Pfüchama, Phesama and Viswema settled at the foothills of the Japfü Range, in the Southern Angami Region located South of Kohima, the capital of Nagaland and thereby facilitating in the preparation of the PBR. The study recorded a total of 567 aquatic sites which include rivers/streams, springs, ponds and man-made water storage structures; a total of 65 faunal species and 48 floral species. It was found that there was not much species variation from one village to the other. And this may be due to the fact that all the study sites come under the foothills of the Japfü Range. The study also shows that the aquatic species contribute significantly to the communities as a source of local food delicacies, traditional medicines, animal feed, bio-fertilizers and others. On the local status of aquatic species for each village, it was observed that there had not been much change in the identified species population as compared to the past. However, there are few exceptions like *Fejewarya sp.* (Fork-tongued Frog) whose population is decreasing due to over collection and introduction of other frog species; floral species like *Azolla filiculoides* and *Spirodella polyrhiza* which are important biofertilizer species were abundant before and has become scanty now due to use of weedicides. The study also showed there are no significant threats to the aquatic resources at present.

The work successfully documented aquatic bio-resources and associated TK, good practices, findings and recommendations of the 12 villages. The aquatic sites being a major contributor of water resources to Dzü-ü and Sidzü rivers, which are two important tributaries of Doyang river, the biggest freshwater river in Nagaland and may therefore contribute to preliminary assessment of its aquatic resources. This work may serve as a baseline data for research related activities in the preparation of inventory of aquatic resources. It may also be used as an important reference material for conservation planning and management of natural resources; for Environmental Impact Assessment; and for strategizing, designing and implementation of various projects.

1. INTRODUCTION

1.1 NAGALAND AND AQUATIC BIODIVERSITY :

Nagaland comes under the Indo-Burma (Myanmar) Biodiversity hotspots of the world. It lies between 25°06' and 27°04' latitude, north of equator and between the longitudinal lines 93°20' E and 95°15' E. The area of the State is 16,579 sq.km. Though, small in surface area the geographical location with varied climatic condition ranging from tropical to temperate conditions have greatly influenced the rich floristic and faunal diversity in the state.

The Northeastern region of India with its diversified lotic and lentic water bodies are considered as the global hotspot for fish biodiversity. Out of the approximately 806 fish species inhabiting fresh waters of India (Talwar and Jhingran, 1991), the Northeast including Nagaland is reported by 266 species belonging to 114 genera under 38 families and 10 orders (Sen, 2000) out of which 196 fish species occurring in North-east have potential ornamental value (Dey *et al.*, 2002). The study on aquatic fauna biodiversity of Dzuna river at Jotsoma village under Kohima district of Nagaland, in between 2020 to 2021 recorded a total of 926 individuals representing 37 species belonging to 6 classes, 13 orders, 22 families (Konyak *et al.*, 2023). The study on Ichthyofaunal diversity within the downstream of Dikhu river and its tributaries in Mon district of Nagaland between 2019 to 2020 recorded a total of 22 fish species belonging to 4 orders, 8 families, 6 sub-families and 17 genera (Konyak and Limatemjen, 2022). The publication on "Fish and Fisheries of Nagaland" published by Dept. of Fisheries, Govt. of Nagaland in 2008 mentioned as many as 149 important fish species of Nagaland.

In Nagaland, aquatic resources play a vital role in the lives of the local communities. The rivers and streams serve as the main source of irrigation for agriculture and water supply to towns and villages. They also serve as an important source of subsistence and food security where local fishes, shellfish and other aquatic species often form a part of the daily diets and also considered as local delicacies. The natural Brine water as well as aquatic/semi-aquatic faunal and floral species like crabs, snails, frogs, *Oenanthe sp.*, and *Equisetum sp.*, are considered to have medicinal and healing properties. The aquatic resources also hold many cultural and spiritual significance, they are often embedded with many folklores and legends for instance, the Shilloi Lake located in Lütsum Village of Phokhungri area under the Meluri sub-division in Phek district has many legends associated with it. One of them being that a baby was found floating in the middle of the lake and two hands were seen bobbing the baby. It is said that the baby is the reigning queen of the lake and that the spirits of the lake are its protector. It is Therefore believed that no one can drown in the lake. For the Nagas, the water body such as stream/river often serves as natural demarcation of boundaries between two individuals/community/villages/tribe/district. At times, there is sharing of water body(ies) between two or more villages to serve as a symbol of brotherhood and to maintain a cordial relationship amongst them. Certain communities practice 'Community fishing' to bring about peaceful co-existence, unity and prosperity amongst the community, it also ensures sharing of common pool resources.

However, very less attention is paid to the vast diversified lotic and lentic aquatic ecosystems of Nagaland, which is home to a vast array of aquatic species. Some of the plausible factors that may be contributing to the under-study of aquatic resources are:

- Geography of Nagaland is characterised by hilly terrain where the water bodies like rivers/streams are mostly situated down under deep slope, sometimes exceeding 500m gradient which is why it becomes difficult to undertake a survey or study.
- Generally, it is also seen that the study on aquatic resources is confined mostly to fishes while the study on other aquatic resources is given less importance.
- There is a likelihood that research on specific group of aquatic resources may have been carried out, but unfortunately there may be no common platform to bring these studies together and facilitate sharing. Or that such study results are often confined to the academic institutional library for access by few.
- Limited support from the government to carry out such studies or research related activities as it is more oriented towards other developmental activities.
- Ignorance of the related agency(ies) to seek funding opportunities for supporting such studies or research may also one of the reasons for its under-study.

1.2 PEOPLE'S BIODIVERSITY REGISTER (PBR):

As mandated in the Biological Diversity Act, 2002, every Biodiversity Management Committee (BMC) must prepare its People's Biodiversity Register in consultation with the local people based on the PBR Guidelines issued by National Biodiversity Authority (NBA). The NBA and State Biodiversity Board (SBB) may provide the guidance and technical support for preparation of PBR.

People's Biodiversity Register is a comprehensive document containing information on available local biological resources (Flora & Fauna) and traditional or indigenous knowledge associated with it. This register is a crucial tool for documenting and conserving biodiversity at the local level as it serves the following critical purposes:

- **Preserve Traditional Knowledge (TK) and Practices:** Local communities, especially indigenous peoples, possess unique knowledge about the biodiversity in their regions. This traditional knowledge and practices are passed down through generations, hold insights into the uses, properties, and ecological significance of various species. Thus, documenting this knowledge or practices in the form of PBR will help preserve and protect it for future generations and ensure that these valuable insights are not lost over time.
- **Conservation and sustainable use:** By documenting the biodiversity in a specific area, a PBR helps in identifying vulnerable species, threatened habitats, and endangered ecosystems and thus can be used for ensuring sustainable management of resources. For example, restoration of traditional crops, fishes, wildlife and habitats and locally endangered wild species, etc. Proper documentation on availability of bio-resources, TK & practices will help in determining the areas for prioritization or adoption of feasible practices suited to local conditions.

THE BIOLOGICAL DIVERSITY (BD) ACT, 2002 & RULES 2004

In India, the Biological Diversity Act, 2002 provide for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto.

ORGANISATIONAL STRUCTURE TO IMPLEMENT THE BD ACT.

National Biodiversity Authority (NBA) State Biodiversity Board (SBB) Biodiversity Management Committee (BMC)

NAGALAND BIOLOGICAL DIVERSITY RULES, 2012

These Rules empower the Board to carry out its functions in conformity with Naga customary laws and practices, concerning land use, religious, traditional, customary and cultural practices.

- **Legal sanctity over bioresource and associated knowledge/practices:** The documentation of bioresources into the PBR will provide legal sanctity over such resources in case of misappropriation. It will help in determining Intellectual Property Rights (IPR) and also ensuring fair and equitable sharing of benefits with the resource owners or TK holders.
- **Creating Education and Awareness:** PBRs can serve as educational resource for creating awareness about the importance of biodiversity among local community and beyond. They can be used in schools and community centres to educate about the biodiversity richness of the area and the need for conservation.
- **Planning and Development tool:** Various agencies, be it policy makers, governmental or non-governmental agencies and even the local village authorities can utilize the information from PBRs to make informed decisions on land-use planning, development projects, and natural resource management. Knowledge on the status of biodiversity present in an area will help in assessing the potential environmental impacts of any developmental activities.
- **Baseline data for biodiversity related research:** The information contained in a local PBR can serve as valuable baseline data to researchers and scientists.

As per the PBR guidelines issued by NBA, there are a total of 31 Formats categorised under different domains. And the following PBR formats are those relating to the aquatic resource domain viz.,

- Format 9 : **Waterscape**
- Format 16 : **Culture Fisheries**
- Format 20 : **Aquatic Biodiversity**
- Format 21 : **Wild Aquatic Plant Species of Importance**
- Format 27 : **Coastal and Marine Flora & Fauna**
(Kindly note: this Format is not relevant in the state of Nagaland hence it was omitted)
- Format 28 : **Wild Animals (Mammals, Birds, Reptiles, Amphibian, Insects, others).**

(The above PBR Formats are Enclosed as Annexure 1)

2. WORK/ACTIVITY

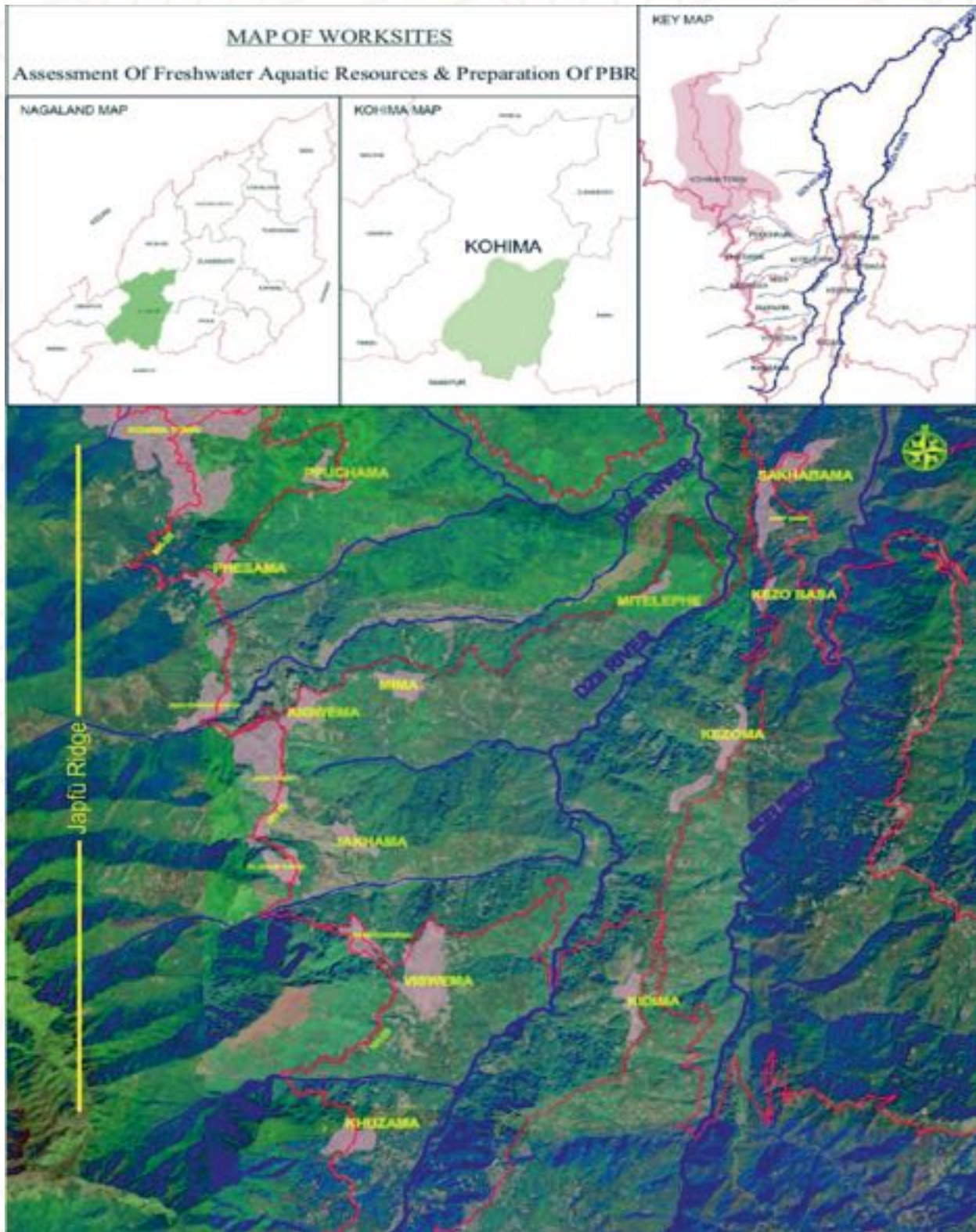
2.1 NATURE OF WORK:

The work focuses on the preliminary quantitative assessment of the freshwater aquatic resources in 12 (Twelve) Villages settled at the foothills of Japfü Range, in the Southern Angami Region located South of Kohima, the capital of Nagaland and thereby facilitating in the preparation of the People's Biodiversity Register (PBR). It includes the documentation and compilation of aquatic resources and its associated Traditional Knowledge (TK). It will also document project activities, good practices, findings and recommendations. The study sites were selected because the region serve as an important watershed area and a major contributor of water resources to Dzü-ü and Sidzü rivers which are 2 (two) important tributaries of Doyang river, the biggest freshwater river in Nagaland. This study may even contribute to the preliminary assessment of aquatic resources of the Doyang river. There is hardly any assessment conducted on aquatic resources at these sites therefore, this work may be considered as one of the first in the area. The result of this work may serve as a baseline data for research related activities and in the preparation of inventory of aquatic resources. It may also be used as an important reference material for conservation planning and management of natural resources; for Environmental Impact Assessments; and for strategizing, designing and implementation of various projects.

2.2 WORK SITE:

The 12 (Twelve) Villages (selected sites) are settled at the foothills of the Japfü Range, in the Southern Region of Kohima, the capital of Nagaland, namely: Chakhabama/Sakhabama, Jakhama, Kezo Basa, Kezoma, Khuzama, Kidima, Kigwema, Mima, Mitelephe, Pfüchama, Phesama and Viswema. (see Fig.1 for site references)

Figure-1



2.2 TASK/MILESTONE ACHIEVEMENT:

TABLE 1: ASSESSMENT OF FRESHWATER AQUATIC RESOURCES AND PREPARATION OF PEOPLE'S BIODIVERSITY REGISTER (PBR)					
Sl. No.	Task/Milestone	Start Month	End Month	Duration	Completion %
1	Meetings, interviews, and consultation with Biodiversity Management Committees (BMCs) and other stakeholders	01 July	31-Aug.	2 months	100%
2	Mapping of the area, incl. river and water bodies	01-Sep.	30-Nov.	2 months	100%
3	Completion of aquatic biodiversity surveys of sites	01-Dec.	31-Mar.	4 months	100%
4	Documentation and compilation of water resources and associated Traditional Knowledge (TK) as per the PBR Format	01-Apr.	31-May.	2 months	100%
5	Preparation of comprehensive PBRs of the selected sites, with focus on aquatic resources	01-Jun.	30-Jun.	1 month	100%
6	Document/ Report on project activities, good practices, findings and recommendations	01-Jun.	30-Jun.	1 month	100%

2.3 METHODOLOGY TOWARDS ACHIEVING THE TASK/MILESTONE:

1. Meetings with the BMC members and village elders: Prior to data collection, the NSBB team had meetings in each village with their respective BMC members/ Village Council members, and few village elders to brief them on the significance of Biological Diversity Act; role of BMC and their role in preparation of PBR.
2. Illustration of Local Mapping: The BMC members and village elders were taught with illustrations on how to prepare the Social and Resource mapping of the village examples on based on their knowledge.
3. Briefing the Field Guides on the activities to be undertaken: Locals were identified as Field Guides and briefed on the activities to be undertaken.
4. Field surveys and experiments: The Field Data Collectors (FDC) along with the Field Guides were assigned with this task.
5. Marking GPS coordinates and site photographs: The FDC accompanied by the Field Guides marked the GPS coordinates and collected all the site photographs.
6. Aquatic data collection and analysis: The aquatic/ semi-aquatic specimens were either identified in the field or collected for identification and detailed information on aquatic resources were gathered from the locals.
7. Interviews with Traditional Knowledge (TK) holders: Further interviews were held with the TK holders to garner about the TK associated with the aquatic resources.
8. Validation and documentation of the data with the BMC and TK holders: All raw data collected in the field were sorted in the corresponding PBR formats and thereafter, these data were validated with the BMC and TK holders in order to ensure that all information compiled are as per their knowledge and uses.
9. Compilation and printing of respective PBR: The aquatic PBR data were compiled and printed for each of the respective village.

3. ACTIVITIES FOR ACHIEVING THE TASK/MILESTONE:

3.1 Meetings and Interviews:

Prior to data collection, the NSBB team had meetings in each village with their respective BMC members/ Village council members and other local stakeholders. These meetings were conducted from 19 July 2022 to 5 August 2022. The following agenda were discussed in the meetings:

- Methodology in preparation of Aquatic PBR :** The participants were first briefed on the significance of Biological Diversity Act, Role of BMC and their role in preparation of the PBR. They were told in detail about the work activity to be carried out during assessment of aquatic resources and the kind of assistance and information required from them for fitting into specific PBR formats relating to aquatic resources. The importance of documenting biological resources along with its uses and traditional knowledge were emphasised. The local biodiversity status was also discussed where the villagers voiced their concerns on the declining population of local aquatic species either due to exploitation or due to the introduction of invasive species. The BMC members were assigned to identify Traditional Knowledge (TK) holders for providing valuable TK information; and to assign local Field Guides to FDCs as and when required during the actual field work.
- Illustration on Social map and Aquatic Resource map of the village:** The participants were briefed on how to prepare the social map and aquatic resource map of their village with suitable illustrations and examples. The illustration includes the type of features or landmarks, such as roads/ schools/ churches/ council hall etc. to be included in social map, while the aquatic resource map to mark/draw features such as rivers/streams/ponds/lakes, etc. Finally, they were assigned to draw these maps with free hand in consultation with other stakeholders.
- Importance of Gender role:** The various roles of men and womenfolk in the village community were deliberated, and how each gender may contribute to this work. For example, menfolk usually carry out fishing, crab or frog catching activities in rivers and streams while womenfolk are seen to do most of the weeding and cleaning of paddy fields. These preference of activities by both genders may result to each having different acquired knowledge on the aquatic resources. The roles of women were emphasised as it is generally seen in these communities that women tend to be more shy and non-participatory in meetings or sharing of information and knowledge.



- **Distribution of PBR Formats relating to aquatic resources in printed form to the BMC:** Photocopy of the relevant PBR formats were distributed to the BMC member for preparatory data collection as well as to acquaint them with the kind of information that will be required for preparing the PBR.

These meetings were held to build rapport with the local people and to instil a sense of concern and ownership of the aquatic PBR. This ensures active participation of all stakeholders.

Result: Through the discussions, it was learnt that different groups of people continue to depend on natural resources at varying scales. There are people who continue to depend largely on locally available bio-resources for their livelihoods and through their keen sense of observation, practices and experimentation developed and established a body of knowledge that is passed on from generation to generation. The members felt that the preparation of Aquatic PBR will indeed be helpful to them especially in context of documenting local/vernacular names and associated traditional knowledge of aquatic resources, as they were already concerned of the eroding local dialect/language, traditional practices, and knowledge in general.

As the meeting progressed, the participants got a better understanding on the importance of Biological Diversity Act; concept of sustainable use and conservation of bio-resources. They seem to understand that the preparation of PBR will involve active support and cooperation of a large number of people from all genders, who need to share their common as well as specialized knowledge. They assured that efforts will be made to identify the persons with proven knowledge of local biodiversity; identify the TK holders; and special attention will be given to the elderly persons who may be able to provide information on the biodiversity status of the past and present. All the meetings ended successfully with assurance from the concerned Village Authorities and BMC members for full support and co-operation to the NSBB team during execution of the field works.



3.2 Mapping of the area, incl. river and water bodies:

The work involved identification of the available permanent and seasonal, flowing and standing, natural and man-made water bodies; collection of geographical locations of all the aquatic sites present in the 12 (Twelve) villages and identification of available aquatic species. This activity was carried out from 13 August 2022 to 9 November, 2022 by the FDCs along with local field guides and/ few BMC members.

Result:

The GPS coordinates of all the accessible aquatic sites present in the study area were recorded and documented. It involved the successful survey of the proposed sites with GPS coordinates; successful identification of the available permanent and seasonal, flowing and standing, natural and man-made water bodies; and identification of available aquatic species, both flora and fauna. (*GPS Coordinates of all aquatic sites attached as Annexure 2 and Aquatic PBRs may be referred to for specific details*). The social and aquatic resource maps were drawn free hand by the BMC in consultation with other village stakeholders and is attached to the respective village PBR.



3.3 Completion of aquatic biodiversity surveys of sites:

All raw data collected in the field were sorted into the corresponding PBR formats. Thereafter, these data were validated with the BMC and TK holders in order to ensure that all information compiled are as per their knowledge and uses.

Result:

A total of 567 (Five Hundred and Sixty-Seven) aquatic sites were surveyed, out of which it includes river/streams, springs, ponds and man-made water storage structures (*Refer Table 2*). The study also recorded/identified the faunal and floral species for each village (*Refer Table 3*). It was found that there was not much species variation from one village to the other. And this may be due to the fact that the study sites come under one particular range i.e., Japfü Range. In total, the study identified 65 species of fauna and 48 species of flora. (*Refer Table 4*).

Table 2: Type and No. of Aquatic sites found village-wise:

Name of Village	Type and No. of Aquatic Sites/Waterscapes											Total
	Bore-Well	Brine- Water	Dug-Well	Irrigation canal	Paddy cum Fishery	Pond/Pond cum Fishery	Ring - Well	River/ Stream	Spring	Water-Pump	Water Tank/ Reservoir	
CHAKHABAMA/ SAKHABAMA					2	1		7	4		13	27
JAKHAMA		2						11	14		42	69
KEZO BASA								22	3	1	13	39
KEZOMA								22	3	1	9	35
KHUZAMA		2						10	1		20	33
KIDIMA		1	2					20	8		21	52
KIGWEMA				3		3		13	44		58	121
MIMA		1				1		10	6	4	18	40
MITELEPHE		1					4	4	3		13	25
PFÜCHAMA						2		8	3		7	20
PHESAMA	2	1				2		4	4		19	32
VISWEMA		4				1		14	11		44	74
Total number of Aquatic Sites											567	

(Refer Annexure 3 for Graphical Representation on Village-wise No. and Type of Aquatic sites)

Table 3: Particulars of village-wise Aquatic Biodiversity

Sl. No.	Name of the village	Particulars of Aquatic Biodiversity	
		No. of Faunal Species Identified	No. of Floral Species Identified
1	CHAKHABAMA/ SAKHABAMA	38	30
2	JAKHAMA	35	37
3	KEZO BASA	39	30
4	KEZOMA	39	30
5	KHUZAMA	35	37
6	KIDIMA	38	26
7	KIGWEMA	41	41
8	MIMA	50	40
9	MITELEPHE	50	40
10	PFÜCHAMA	45	37
11	PHESAMA	43	40
12	VISWEMA	46	37

(Refer Annexure 4 for Graphical Representation on village-wise Aquatic Biodiversity).

Table 4: Identified Species (Fauna & Flora)

FAUNA (65 Species)			
AMPHIBIANS		INSECTS	
Sl. No.	Scientific Name	Sl. No.	Scientific Name
1	<i>Amolops kohimaensis</i>	1	<i>Aeshna</i> sp.
2	<i>Amolops nidorbellus</i>	2	<i>Agabus</i> sp.
3	<i>Euphlyctis</i> sp.	3	<i>Anax</i> sp.
4	<i>Fejervarya</i> sp.	4	<i>Calineuria</i> sp.
5	<i>Polypedates</i> sp.	5	<i>Cordulegastridae</i> Family
6	<i>Rhacophorus maximus</i>	6	<i>Corydalus cornutus</i>
FISHES		7	<i>Crocothemis servilia</i>
Sl. No.	Scientific Name	8	<i>Cybister</i> sp.
1	<i>Badis badis</i>	9	<i>Epeorus</i> sp.
2	<i>Barilius bendelisis</i>	10	<i>Epeorus longimanus</i>
3	<i>Barilius vagra</i>	11	<i>Ephemera</i> sp.
4	<i>Channa gachua</i>	12	<i>Gerris</i> sp.
5	<i>Channa orientalis</i>	13	<i>Hydrophilus traingularis</i>
6	<i>Channa striata</i>	14	<i>Laccotrephes</i> sp.
7	<i>Crossocheilus latius latius</i>	15	<i>Leptoceridae</i> Family
8	<i>Ctenopharyngodon idella</i>	16	<i>Notonecta</i> sp.
9	<i>Cyprinus carpio</i>	17	<i>Periplaneta</i> sp.
10	<i>Danio dangila</i>	18	<i>Sympetrum</i> sp.
11	<i>Danio rerio</i>	19	<i>Tipula</i> sp.
12	<i>Devario</i> sp.	MALACOSTRACA (CRABS)	
13	<i>Esomus danrica</i>	Sl. No.	Scientific Name
14	<i>Exostoma berdmorei</i>	1	<i>Brachyura</i> sp.
15	<i>Gambusia affinis</i>	2	<i>Indochinamon</i> sp.
16	<i>Garra</i> sp.	3	<i>Macrobrachium</i> sp.
17	<i>Garra mccllelandi</i>	4	<i>Maydelliathelphusa lugubris</i>
18	<i>Lepidocephalichthys guntea</i>	5	<i>Potamidae</i> Family
19	<i>Mastacembelus armatus</i>	6	<i>Potamon</i> sp.
20	<i>Nemacheilidae</i>	GASTROPODA (SNAILS)	
21	<i>Nemacheilus manipurensis</i>	Sl. No.	Scientific Name
22	<i>Pethia ticto</i>	1	<i>Bellamya</i> sp.
23	<i>Psilorhynchus</i> sp.	2	<i>Bellamya bengalensis</i>
	<i>Schistura</i> sp.	3	<i>Brotia</i> sp.
25	<i>Schizothorax richardsoni</i>	4	<i>Gastropoda</i>
	<i>Silurus</i> sp.	5	<i>Lymnae</i> sp.
27	<i>Tor tor</i>	6	<i>Lymnaeidae</i> Family
		7	<i>Planorbidae</i> Family

FLORA (48 Species)			
Sl. No.	Scientific Name	Sl. No.	Scientific Name
1	<i>Acrorus calamus</i>	25	<i>Lecanthus peduncularis</i>
2	<i>Alisma plantago-aquatica</i>	26	<i>Marchantia sp.</i>
3	<i>Alternanthera philoxeroides</i>	27	<i>Musa sp.</i>
4	<i>Azolla filiculoides</i>	28	<i>Nasturtium officinale</i>
5	<i>Begonia sp.</i>	29	<i>Oenanthe javanica</i>
6	<i>Brachiaria sp.</i>	30	<i>Persicaria hydropiper</i>
7	<i>Cardamine hirsuta</i>	31	<i>Persicaria nepalensis</i>
8	<i>Centella asiatica</i>	32	<i>Phragmites karka</i>
9	<i>Chara sp.</i>	33	<i>Pistia stratiotes</i>
10	<i>Colocasia sp.</i>	34	<i>Plantago sp.</i>
11	<i>Commelina benghalensis</i>	35	<i>Poa annua</i>
12	<i>Cyanotis vaga</i>	36	<i>Polygonum hydropiper</i>
13	<i>Cyathocline purpurea</i>	37	<i>Ranunculus diffuses</i>
14	<i>Cynodon dactylon</i>	38	<i>Ranunculus sp.</i>
15	<i>Cyperus cuspidatus</i>	39	<i>Rotala rotundifolia</i>
16	<i>Cyperus rotundus</i>	40	<i>Rumex crispus</i>
17	<i>Cyperus sp.</i>	41	<i>Schoenoplectiella mucronata</i>
18	<i>Eichhornia crassipes</i>	42	<i>Schoenoplectus juncooides</i>
19	<i>Equisetum arvense</i>	43	<i>Selaginella sp.</i>
20	<i>Equisetum sp.</i>	44	<i>Spilanthes acmella</i>
21	<i>Funaria sp.</i>	45	<i>Spirodella polyrhiza</i>
22	<i>Houttuynia cordata, Thunb.</i>	46	<i>Spirogyra sp.</i>
23	<i>Hydrocotyle sibthorpioides</i>	47	<i>Typha sp.</i>
24	<i>Impatiens pulcherrima</i>	48	<i>Zantedeschia aethiopica</i>

(Aquatic PBRs of the villages may be referred to for specific details).

3.4 Documentation, Compilation of Data and printing of PBR:

After field work all the raw data collected were sorted in the corresponding PBR formats. and thereafter, these data were validated by the BMC and TK holders in each village through meetings/interviews. This is done to ensure that all information compiled are as per their knowledge and uses. Finally, the compiled Aquatic PBR for each village is printed and handed to the respective BMCs. 16

Result:

The validated compiled data is printed as the Aquatic PBR for each of the 12 villages. The PBR includes details of all the aquatic resources, good practices followed by the community and recommendations made by the respective BMCs. This task was completed by June 2023 and a copy of Aquatic PBR is handed to their respective BMC for safekeeping and record. (Enclosed: Aquatic PBR for the 12 Villages)

4. GOOD PRACTICES:

In general, it was found that all the villages follow certain good practices for biodiversity conservation including protection of aquatic resources, such as:

- Conservation of Aquatic resources by banning the use of chemicals or electrocution while encouraging traditional methods in fishing activities.
- Conservation of wild biodiversity by prohibition of hunting in the village jurisdiction by the Village Council and Youth; prohibition of forest fire; and cutting of trees for timber and fuelwood from community conservation areas.
- Practice of paddy cum pisciculture seem to be common.
- The Village Council and the Youth organisation play active role in biodiversity conservation sustainable management of natural resource by laying down of orders and certain rules. For eg. prohibition on collection of brine water for commercial purposes as seen in Viswema Village.
- Traditional knowledge holders are encouraged to practice their traditional approaches among the villagers in all possible aspects. For eg. the use of species like *Spirodella polyrhiza* as biofertilizers while use of inorganic fertilizers are strongly discouraged.
- Sharing of bioresources with other communities/villages in need. For instance, supplying of portable water to villages that face water shortage.



5. FINDINGS:

5.1 Aquatic Sites:

The current assessment recorded a total of 567 Aquatic sites/Waterscapes which include rivers, streams, springs, ponds and man-made water storage structures. The aquatic sites are used by the local communities mainly for irrigation, domestic use and consumption purposes. Almost all the rivers, streams and springs are perennial in nature and this region serves as an important watershed area to Kohima district. The aquatic sites contribute to Dzü-ü and Sidzü rivers, which are two important tributaries of Doyang river, the biggest freshwater river in Nagaland.

5.2 Aquatic Fauna and Flora:

The region, Japfü Range represented by 12 villages is found to harbour good number of faunal and floral aquatic diversity like insects, fishes, amphibians, crabs and aquatic/semi-aquatic flora. The present study recorded/identified, 65 species of fauna and 48 species of flora. It was found that there was not much species variation from one village to the other. This may be due to the fact that the study sites come under one particular mountain range. The study also shows that the aquatic species contribute significantly to the communities as a source of local food delicacies, traditional medicines, animal feed, bio-fertilizers and others. It was also found that most of the aquatic bioresources are used mainly as food, medicine or animal feed as indicated in Table 5 (*Refer the Aquatic PBRs for specific details*). On the local status of aquatic species for each village, it was

observed that there had not been much change in the identified species population as compared to the past. However, there are few exceptions like *Fejewarya* sp. (Fork-tongued Frog) whose population is found to be decreasing due to over collection and introduction of other frog species; floral species like *Azolla filiculoides* and *Spirodella polyrhiza* were abundant before and has become scanty now due to use of weedicides. The study also showed there are no significant threats to the aquatic resources as of now. This may be because the villages have been following the good practices as mentioned earlier.

Table 5. Local uses of aquatic Fauna and Flora:

USES	FOOD	MEDICINAL	ANIMAL FEED	BIO-FERTILIZER	OTHER USES
CHAKHABAMA/ SAKHABAMA VILLAGE					
FAUNA	36	9	-	-	-
FLORA	9	12	4	-	3
JAKHAMA VILLAGE					
FAUNA	29	9	-	-	-
FLORA	12	13	17	2	7
KEZO BASA VILLAGE					
FAUNA	38	8	-	-	-
FLORA	9	4	1	-	2
KEZOMA VILLAGE					
FAUNA	38	4	-	-	-
FLORA	9	4	1	-	2
KHUZAMA VILLAGE					
FAUNA	30	-	-	-	1
FLORA	12	3	13	1	1
KIDIMA VILLAGE					
FAUNA	29	6	-	-	-
FLORA	8	6	13	2	10
KIGWEMA VILLAGE					
FAUNA	40	7	-	-	-
FLORA	10	8	13	1	1
MIMA VILLAGE					
FAUNA	45	5	2	-	2
FLORA	10	6	13	-	4
MITELEPHE VILLAGE					
FAUNA	42	7	-	-	-
FLORA	9	9	10	2	4
PFÜCHAMA VILLAGE					
FAUNA	38	2	-	-	-
FLORA	8	8	8	-	1
PHEASAMA VILLAGE					
FAUNA	39	-	-	-	-
FLORA	12	5	11	1	2
VISWEMA VILLAGE					
FAUNA	38	11	-	-	-
FLORA	12	10	16	2	9

(Aquatic PBRs of the villages may be referred to for specific details)

6. RECOMMENDATIONS:

To maintain the richness of the aquatic ecosystem, timely **monitoring** may be done in major or important aquatic sites of the village. This may be or should be done by the BMCs since they are a committee entrusted by the village authorities to look after all matter relating to biodiversity in the village. Certain threats like use of pesticides/weedicides and inorganic fertilizers in agricultural fields, use of chemicals or electrocution in rivers/streams by few individuals covertly persist. Developmental activities like road widening without proper planning and dumping of earth in the rivers and streams is also said to pose threat to the aquatic ecosystem as was in the case of Chakhabama/Sakhabama village a few years ago. This monitoring should be done in order to minimise the risk of such potential threats to aquatic habitats and its resources. Stone quarrying from some stretch of river beds in villages like Phesama and Jakhama may pose high risk to the aquatic and surrounding ecosystem if it continues. Therefore, after proper monitoring of such activities suitable precautionary or preventive measures may be taken up by the concerned local authorities depending on the type and level of risk in such areas.

There is also a need to spread **awareness** around the locals about the importance of conserving the overall fauna and flora of rivers, streams and springs as these freshwater sources provide numerous benefits directly or indirectly. For example, they are used by the local communities mainly for irrigation, domestic use and consumption purposes, as well as supporting life forms and providing habitat to aquatic animals and plants. Ignoring threats to freshwater ecosystem will amplify risk to both human and aquatic life forms and ultimately undermine prosperity since it was learnt that different groups of people continue to depend on natural resources as a source of livelihood. For example, local species of frogs, snails, fishes and crabs fetch good price in the local markets due to their high demand. Thus, the loss of such resources from the area will limit or decrease a source of income.

In general, there are few recommendations received from the 12 villages:

- Create more awareness in the village on the importance of maintaining balanced Aquatic ecosystem and sustainable use of aquatic resources.
- Strengthen supervision and quality monitoring of Aquatic resources by strengthening rules and regulation laid by the Village Council, and by involving government or non-government agencies who deals with biodiversity related matters.
- Support stakeholders for exchange of traditional knowledge and values among society, academic institutes and government.
- To declare important and fragile areas as conservation / community reserve area; and identification of endemic, indigenous and IUCN red list species so as to prioritise their conservation efforts. Such activity will require thorough research and field work.
- Construction of large water reservoirs for storing water and distribution to places with water scarcity to help tackle the problem.
- Understand the intricacies of traditional knowledge and its potential to modern application.
- Mainstream, adopt, adapt and integrate the traditional knowledge systems to modern and changing socio-ecological and economic conditions.
- Develop strategies to identify potential aquatic bioresources, and to use it sustainably for enhancing livelihood.
- Develop mechanism to inspect and examine fake herbal/ bio-products sold in the name of traditional practices.

7. CHALLENGES:

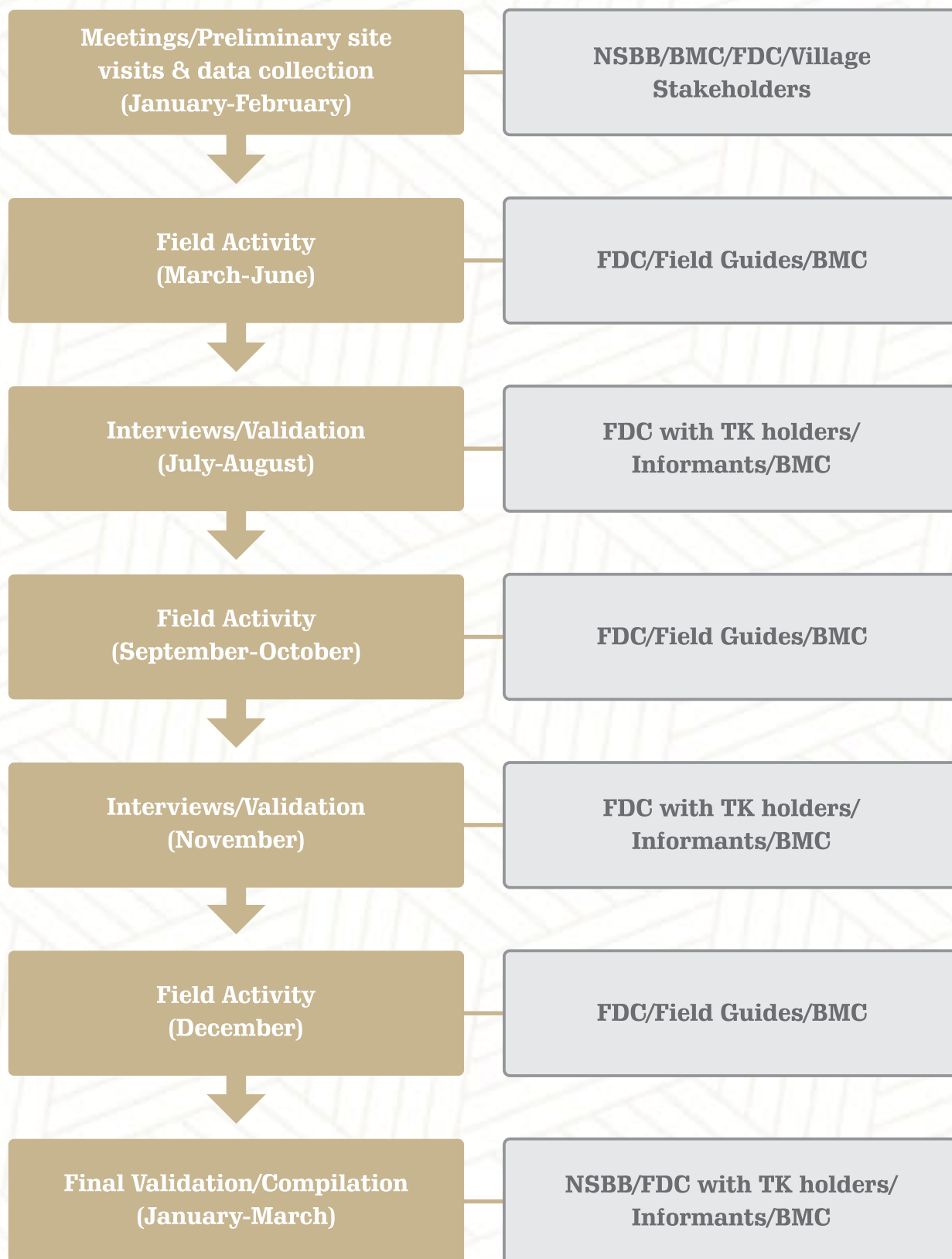
Some of the challenges faced during execution of the work/activities are:

- **Time period and Manpower limitations:** The data to be collected as per PBR formats is very exhaustive. And the time period (12 months) given to complete the work (meetings/field works/interviews/validation/compilation and report writing) was very challenging. In this work only 2 FDCs were engaged for 72 days to collect field data in the 12 villages. They could dedicate only 6 days/ village for field works which is not sufficient.
- **Season limitations:** While carrying out the field activity, the FDCs faced sporadic heavy rainfall which hindered the progress of field works.
- **Accessibility to Aquatic sites:** Most of the important aquatic sites in the region are located in difficult terrain thus their accessibility was quite challenging for the FDCs. In some cases, it takes the whole day to trek to a few sites which is time and resource consuming.
- **Meeting with TK holders/Informants:** In our case, most of the informants in the villages are farmers and are actively engaged in farming activities, even the elderly. Hence, it was challenging to find suitable time for taking their interviews and carrying out the validation works.
- **Compliance to procedures/processes for financial transactions:** Most of the work are carried out in rural areas and with poor or no financial institutions. The locals who are involved to assist in the works usually do not have active bank accounts which makes it problematic to comply with financial transaction processes. It is also difficult to procure proper bills or vouchers while working in rural areas in the context of Nagaland.

8. POINTS FOR CONSIDERATION:

- Having **meetings** informally with the villages stakeholders to create conducive environment prior to field work was found to be very productive as the participants became comfortable and frank. These meetings were held to build rapport with the local people and to instil a sense of concern and ownership of the aquatic PBR. And this has ensured active participation of all stakeholders.
- As far as possible informants should represent **elders, youth and women**. And their views/opinions should be respected and considered.
- **Honorarium** to informants or TK holders should always be considered for sparing their time to share valuable knowledge.
- The **season** for data collection should be considered prior to taking up such works. This is because certain species are available/non- available during a particular season. For eg. More species are seen in spring time as compared to the lean winter months. While during the monsoon it becomes difficult to carry out field works due to incessant rain accompanied by runoff and increase of water level and volume in water bodies. Therefore, the field work period should be spread across all these seasons for gathering good information.
- **Manpower** in terms of no. of FDCs should be in proportion to the number of assigned work sites. From this present work, it was realised that ideally 1 FDC should be assigned with only 2 villages for a period of 15 months. In context of Nagaland, the following process may work for preparation of Aquatic PBRs:

FLOW CHART SHOWING THE PROCESS WHICH MAY WORK FOR PREPARING AQUATIC PBR



REFERENCES

AO, S., DEY, S.C., & SARMAH, S.K. (2008). Fish and Fisheries of Nagaland. Department of Fisheries, Government of Nagaland, Kohima, Nagaland.

DEY, S.C., KAKATI, M., & SARMAH, S.K. (2002). Preinvestment feasibility study on Ornamental fish in NorthEastern Region. *Final Report*, NEDFi, 469p.

KONYAK, S.L., Y. YIMKHIUNG, SHEKHUMCHA., LIMATEMJEN & PESEYIE, K. (2023). Aquatic fauna biodiversity in Dzuna River, Jotsoma, Nagaland, India. 10.22271/fish.2023.v11.i3a.2809.

KONYAK, S.L., & LIMATEMJEN. (2022). Ichthyofaunal Diversity of Downstream Dikhu River and its Tributaries in Mon District of Nagaland, India. *Asian Journal of Fisheries and Aquatic Research*. 18, 1 (Jun. 2022), 16–22.

SEN, N. (2000). Occurrence, distribution and status of diversified fish fauna of North East India. In *Biodiversity of North East India* (ed) A.G. Pooniah and U.K. Sarkar, NBFGR-NATP Publication No. 2, Lucknow.

TALWAR, P.K. & JHINGRAN, A.G. (1991). *Inland fishes of India and adjacent countries*, Vol.1&2: 1-4158. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.



PHOTO GALLERY





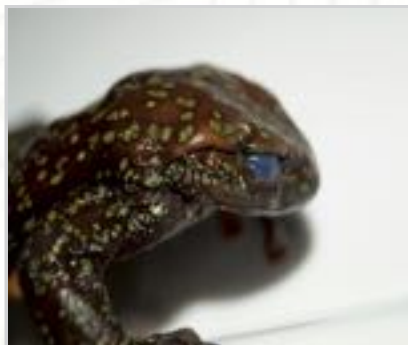




FAUNA



Amolops kohimaensis



Amolops nidorbellus



Corydalis cornutus



Ctenopharyngodon idella



Indochinamon sp.



Notonecta sp.



Potamon sp.



Polypedates sp.



Psilorhynchus sp.



Fejervarya sp.



Anax sp.



Silurus sp.

FLORA



Alternanthera philoxeroides



Azolla filiculoides



Colocasia sp.



Commelina benghalensis



Equisetum arvense



Hydrocotyle sibthorpioides



Eichhornia crassipes



Persicaria nepalensis



Ranunculus sp.



Selaginella sp.



Spirodela polyrhiza



Zantedeschia aethiopica

PBR FORMATS FOR DOCUMENTING AQUATIC RESOURCES (AS ISSUED BY NBA)

Format 9: Waterscape

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
Waterscape element type	Sub-type	Features and approx area	Ownership	General flora	General fauna	Major uses	User groups	Management practices	General uses	Associated TK	Other details	Community accessed

Examples: Ponds, Streams, Rivers, Lake, Canal, Tubewell, Dug well etc.,

Format 16: Culture Fisheries

1	2	3	4	5	6	7		8	9	10	11	12
						Local status	Present					
Fish Type	Local Name	Scientific Name	Variety	Features	Waterscape (pond/bheri/talao)	Past	Present	Uses	Associated TK	Commercial rearing	Other details	Community Know. Holders

Note: Other details include mode of catching fish, time of availability, breeding time, feeds and etc

Format 20: Aquatic Biodiversity

1. Local Name	2. Scientific Name	3. Variety	4. Features	5. Habitat	6. Local Status		7. Uses	8. Associated TK	9. Other details	10. Community/ Knowledge Holder
					Past	Present				

Other details may include mode of catching fish, time of availability, breeding time, etc

Format 21: Wild Aquatic Plant Species of Importance

1. Sl. No.	2. Local Name	3. Scientific Name	4. Variety	5. Importance	6. Trends

Format 28: Wild Animals (Mammals, Birds, Reptiles, Amphibia, Insects, others)

1. Animal Type	2. Local Name	3. Scientific Name	4. Habitat	5. Description	6. Season when seen	7. Local Status		8. Uses (if any)	9. Associated TK	10. Mode of Hunting, collecting (if any)	11. Other details	12. Community/ Knowledge Holder
						Past	Present					

VILLAGE-WISE GPS COORDINATES OF ALL AQUATIC SITES**1. Total Aquatic Sites of Chakhabama/Sakhabama Village: 27 Nos.**

Sl.No	Local Name	Location/GPS coordinate		
		Latitude (N)	Longitude (E)	Altitude (MAMSL)
PADDY CUM FISHERY(S)				
1	Methatso Kiso Fishery	25.683038	94.215865	743.00
2	Pukrosa Kiso Fishery	25.685745	94.201729	963.00
POND				
1	Zade	25.668987	94.197121	1061.73
RIVER				
1	Sidzü	25.659261	94.217481	725.42
SPRING(S)				
1	Basa Dzürkhü	25.680787	94.197133	1014.89
2	Dzürüke	25.670274	94.194238	1062.11
3	Manie Dzühü	25.681269	94.199487	1001.05
4	Neise Dzühü	25.680784	94.197635	1011.90
STREAM(S)				
1	Mewinüzü rü	25.707180	94.197958	1115.89
2	Sachozü rü	25.684168	94.198937	1054.66
3	Sathi rü	25.661815	94.198535	1079.92
4	Temo rü	25.665880	94.197477	1082.12
5	Thokhwedu rü	25.678523	94.195095	1014.08
6	Viyiekhado rü	25.690675	94.202812	1051.11
WATER TANK(S)				
1	Water tank.1	25.681846	94.196509	1062.86
2	Water tank.2	25.675510	94.193729	1071.16
3	Water tank.3	25.675648	94.193886	1071.45
4	Water tank.4	25.675919	94.194108	1066.52
5	Water tank.5	25.672719	94.194716	1089.80
6	Water tank.6	25.671371	94.195279	1125.69
7	Water tank.7	25.671350	94.195135	1125.57
8	Water tank.8	25.671013	94.195312	1120.92
9	Water tank.9	25.670608	94.196018	1098.18
10	Water tank.10	25.670859	94.195834	1106.78
11	Water tank.11	25.670378	94.196775	1079.53
12	Water tank.12	25.666848	94.196687	1087.22
13	Water tank.13	25.670308	94.196492	1087.31

2. Total Aquatic Sites of Jakhama Village: 69 Nos.

Sl.No	Local Name	Location/GPS coordinate		
		Latitude (N)	Longitude (E)	Altitude (MAMSL)
BRINE WATER (S)				
1	Oza Zadi	25.590741	94.167835	1029.06
2	Oza Zahe	25.590697	94.16786	1024.9
RIVER(S)/ STREAM(S)				
1	Chüchorü/Tsüchorü	25.583894	94.110424	1769.48
2	Kehorü	25.584379	94.116113	1667.82
3	Kevüza dzüyie	25.585035	94.118801	1659.27
4	Khadihela-o	25.576831	94.125377	1655.27
5	Lemo dzüyie	25.585024	94.120149	1639.23
6	Mekhontsarü	25.587761	94.120241	1703.6
7	Tevükorü	25.596013	94.124157	1677.78
8	Tsükorü	25.571562	94.123097	1634.94
9	Wiza dzüyie	25.585236	94.122559	1611.7
10	Yiedi dzüyie	25.584523	94.12251	1614.41
11	Zarü	25.588899	94.170881	1085.23
SPRING(S)				
1	Chüchorü dzüla	25.584885	94.121476	1622.63
2	Khieya dzüla	25.584611	94.116019	1738.19
3	Kiphodzü	25.581839	94.13811	1567.48
4	Popitsodzükhwe/Zebadzükhwe	25.586919	94.136613	1540.22
5	Radzüla	25.586919	94.136613	1540.79
6	Ranthüza dzüla	25.583719	94.113323	1669.45
7	Temezakhu	25.588476	94.122185	1569.53
8	Tsakiezwü	25.579438	94.123101	1762.06
9	Tsondzükhwe	25.585154	94.133248	1575.52
10	Yiedibo/Dzüpü	25.584523	94.12251	1614.41
11	Yodühoto	25.582554	94.136616	1551.24
12	Zashedzükhwe	25.587202	94.135685	1567.42
13	Zetsuntsükee	25.591173	94.125381	1636
14	Zhodi dzüla	25.579451	94.126698	1646.62
WATER TANK(S)/ RESERVOIR(S)				
1	Tank No. 1	25.586636	94.130819	1627.53
2	Tank No. 2	25.58657	94.132839	1601.25
3	Tank No. 3	25.585998	94.133131	1605.94
4	Tank No. 4	25.585756	94.133644	1600.26

5	Tank No. 5	25.585678	94.134578	1598.93
6	Tank No. 6	25.585225	94.134302	1596.39
7	Tank No. 7	25.584878	94.133629	1604.63
8	Tank No. 8	25.584693	94.134057	1599.83
9	Tank No. 9	25.585455	94.135301	1607.12
10	Tank No. 10	25.586003	94.135465	1596.97
11	Tank No. 11	25.584846	94.135751	1603.86
12	Tank No. 12	25.584883	94.135728	1607.07
13	Tank No. 13	25.584545	94.136218	1604.7
14	Tank No. 14	25.584337	94.136088	1599.27
15	Tank No. 15	25.584434	94.135017	1595.02
16	Tank No. 16	25.584228	94.135113	1589.27
17	Tank No. 17	25.584151	94.134861	1596.71
18	Tank No. 18	25.583776	94.135455	1583.19
19	Tank No. 19	25.583833	94.135999	1595.52
20	Tank No. 20	25.583566	94.136511	1598.33
21	Tank No. 21	25.583225	94.136328	1593.47
22	Tank No. 22	25.582968	94.137365	1602.99
23	Tank No. 23	25.582557	94.138078	1607.53
24	Tank No. 24	25.582695	94.138097	1613.92
25	Tank No. 25	25.582754	94.138088	1613.88
26	Tank No. 26	25.582677	94.138572	1611.15
27	Tank No. 27	25.582677	94.139163	1606.48
28	Tank No. 28	25.583262	94.13879	1600.03
29	Tank No. 29	25.582374	94.138994	1614.27
30	Tank No. 30	25.581966	94.138862	1611.96
31	Tank No. 31	25.582834	94.135899	1586.5
32	Tank No. 32	25.582394	94.135262	1584.89
33	Tank No. 33	25.581248	94.134921	1567.42
34	Tank No. 34	25.584155	94.133908	1589.5
35	Tank No. 35	25.590008	94.125045	1656.89
36	Tank No. 36	25.591474	94.12405	1680.99
37	Tank No. 37	25.5903	94.124216	1671.25
38	Tank No. 38	25.588623	94.122562	1679.72
39	Tank No. 39	25.588851	94.121915	1698.62
40	Tank No. 40	25.585823	94.120296	1675.89
41	Tank No. 41	25.579284	94.126214	1696.68
42	Tank No. 42 (Reservoir)	25.57769	94.122961	1795.4

3. Total Aquatic Sites of Kezo Basa Village: 39 Nos.

Sl.No	Local Name	Location/GPS coordinate		
		Latitude (N)	Longitude (E)	Altitude (MAMSL)
RIVER(S)				
1	Dzü	25.656886	94.187018	856.36
2	Sidzü	25.690828	94.227019	780.26
STREAM(S)				
1	Bohonyü rü	25.599131	94.2037530	1181.86
2	Chorü rü	25.643816	94.1990560	1079.13
3	Holelzhö rü	25.595719	94.1915090	1499.49
4	Hothathi rü	25.603278	94.1943380	1473.28
5	Mengu rü	25.595565	94.1997590	1216.07
6	Phezho rü	25.633316	94.1982850	1057.37
7	Pserü	25.620458	94.1996600	1169.17
8	Ravo rü	25.607747	94.1947920	1440.90
9	Sathi rü	25.661702	94.1985898	1079.75
10	Sherü	25.640809	94.1994870	1046.12
11	Teboyi rü	25.610863	94.1930510	1375.91
12	Texü rü	25.625162	94.1990210	1111.20
13	Tezho rü	25.652445	94.1975530	1057.59
14	Tsakhü rü	25.634107	94.2000290	1084.82
15	Vüno rü	25.590913	94.1833600	1468.61
16	Vüza rü	25.618858	94.2038660	1134.59
17	Yolenetso rü	25.602292	94.2037910	1250.48
18	Zoza rü	25.639184	94.1966500	1043.91
19	Ramezou rü	25.595230	94.1929440	1439.22
20	Tomydzüla	25.597467	94.1937940	1446.63
SPRING(S)				
1	Kithodzü	25.601028	94.191806	1472.25
2	Sheledzü	25.602628	94.194058	1479.42
3	Temedzü	25.600325	94.195247	1434.87
WATER TANK(S) / RESERVOIR(S)				
1	Water Reservoir (No.1)	25.621948	94.198959	1158.61
2	Water Reservoir (No.2)	25.621353	94.198056	1181.64
3	Water tank No.1	25.620417	94.199551	1169.76
4	Water tank No.2	25.625633	94.201007	1136.32
5	Water tank No.3	25.623929	94.198365	1136.43
6	Water tank No.4	25.622177	94.197215	1162.73
7	Water tank No.5	25.621359	94.197100	1187.49
8	Water tank No.6	25.622413	94.198764	1149.77
9	Water tank No.7	25.621520	94.198884	1168.48
10	Water tank No.8	25.621356	94.197972	1182.37
11	Water tank No.9	25.621525	94.197365	1175.59
12	Water tank No.10	25.622257	94.197264	1153.46
13	Water tank No.11	25.622102	94.198355	1149.97
WATER PUMP(S)				
1	Water pump	25.631946	94.213886	784.14

4. Total Aquatic Sites of Kezoma Village: 35 Nos.

Sl. No	Local Name	Location / GPS coordinate		
		Latitude (N)	Longitude (E)	Altitude (MAMSL)
RIVER(S)				
1	Dzü	25.656886	94.187018	856.36
2	Sidzü	25.690828	94.227019	780.26
SPRING(S)				
1	Kithodzü	25.601028	94.191806	1472.25
2	Sheledzü	25.602628	94.194058	1479.42
3	Temedzü	25.600325	94.195247	1434.87
STREAM(S)				
1	Bohonyü rü	25.599131	94.203753	1181.86
2	Holelzhö rü	25.595719	94.191509	1499.49
3	Hothathi rü	25.603278	94.194338	1473.28
4	Mengu rü	25.595565	94.199759	1216.07
5	Phezho rü	25.633316	94.198285	1057.37
6	Pserü	25.620458	94.199660	1169.17
7	Ramezou rü	25.595230	94.192944	1439.22
8	Ravo rü	25.607747	94.194792	1440.90
9	Sathi rü	25.661702	94.198590	1079.75
10	Sherü	25.640809	94.199487	1046.12
11	Teboyi rü	25.610863	94.193051	1375.91
12	Texü rü	25.625162	94.199021	1111.20
13	Tezho rü	25.652445	94.197553	1057.59
14	Tsakhü rü	25.634107	94.200029	1084.82
15	Tomydzüla	25.597467	94.193794	1446.63
16	Vüno rü	25.590913	94.183360	1468.61
17	Vüza rü	25.618858	94.203866	1134.59
18	Yolenetso rü	25.602292	94.203791	1250.48
19	Zoza rü	25.639184	94.196650	1043.91
WATER PUMP				
1	Water pump	25.631946	94.213886	784.14
WATER TANK(S)/RESERVOIR(S)				
1	Tank No 1	25.605516	94.195730	1477.11
2	Tank No 2	25.604780	94.196408	1493.95
3	Tank No 3	25.602148	94.195954	1508.84
4	Tank No 4	25.602092	94.195270	1515.11
5	Tank No 5	25.601464	94.194757	1524.73
6	Tank No 6	25.600806	94.193869	1518.74
7	Tank No 7	25.601129	94.193123	1512.78
8	Tank No 8	25.598728	94.193987	1494.94
9	Tank No 9	25.599727	94.193846	1510.89

5. Total Aquatic Sites of Khuzama Village: 33 Nos.

Sl.No	Local Name	Location/GPS coordinate		
		Latitude (N)	Longitude (E)	Altitude (MAMSL)
BRINE WATER(S)				
1	Tongo oza	25.543022	94.148951	1424.13
2	Zasa oza	25.529856	94.141202	1544.33
RIVER(S)				
1	Bol	25.530440	94.144588	1474.62
2	Tecünul	25.522811	94.122906	1896.78
STREAM(S)				
1	Mazayil	25.526077	94.135096	1699.44
2	Merol	25.545067	94.128357	1547.78
3	Mewobokie	25.532286	94.127653	1791.65
4	Sarencie	25.545304	94.133812	1501.08
5	Sokrabo	25.526710	94.130533	1812.31
6	Sokrabo 1	25.526844	94.130229	1810.63
7	Tevolü	25.540762	94.133436	1674.17
8	Tsükhrolü	25.536426	94.135841	1684.62
SPRING				
1	Spring Water	25.531967	94.127653	1790.76
WATER TANK(S)/WATER RESERVOIR(S)				
1	Water tank 1	25.535859	94.136641	1690.56
2	Water tank 2	25.536567	25.536567	1687.08
3	Water tank 3	25.536981	94.137902	1681.03
4	Water tank 4	25.535453	94.137461	1684.02
5	Water tank 5	25.535042	94.137149	1688.23
6	Water tank 6	25.534800	94.136719	1694.92
7	Water tank 7	25.535241	94.136557	1698.11
8	Water tank 8	25.534791	94.136175	1701.03
9	Water tank 9	25.535583	94.135661	1696.32
10	Water tank 10	25.535589	94.134694	1708.33
11	Water tank 11	25.535531	94.134521	1711.01
12	Water tank 12	25.534323	94.13353	1720.6
13	Water tank 13	25.534955	94.13284	1740.38
14	Water tank 14	25.535319	94.132908	1740.3
15	Tank 15/Water Reservoir	25.535092	94.131402	1765.41
16	Water tank 16	25.533678	94.130926	1770.82
17	Tank 17/Water Reservoir	25.536433	94.128143	1859.02
18	Water tank 18	25.536488	94.131897	1763.38
19	Water tank 19	25.537257	94.133754	1756.49
20	Water tank 20	25.537367	94.134679	1734.96

6. Total Aquatic Sites of Kidima Village: 52 Nos.

Sl.No.	Local Name	Location/ GPS coordinates		
		Latitude (N)	Longitude (E)	Altitude (MAMSL)
BRINE WATER				
1	Thami za	25.551789	94.136744	1666.87
RING WELL(S)				
1	Ring Well 1	25.561179	94.180422	1555.19
2	Ring Well 2	25.554501	94.180373	1623.21
SPRING(S)				
1	Basa	25.555893	94.181850	1537.92
2	Chophi	25.558138	94.177037	1248.82
3	Chose dzükhrou	25.561636	94.179921	1570.88
4	Ekhro	25.561564	94.180296	1562.46
5	Eso dzükhrou	25.561288	94.180157	1567.24
6	Kinkiro	25.558065	94.180101	1573.04
7	Meraza	25.544837	94.189861	1170.27
8	Sapikhe	25.547522	94.186762	1215.15
STREAM(S)/RIVER(S)				
1	A-Ayarü-ü	25.572553	94.182388	1420.33
2	Chophirü-ü	25.557860	94.176946	1569.13
3	Chosedzüpherü-ü	25.551303	94.176816	1538.35
4	Chovarü-ü	25.555937	94.188245	1330.00
5	Kelerü-ü	25.535319	94.187779	1058.96
6	Ketsarü-ü	25.548492	94.173415	1535.63
7	Kevedzü-ü	25.537112	94.186865	1094.62
8	Keverü-ü 1	25.580715	94.183014	1432.85
9	Keverü-ü 2	25.567639	94.173753	1313.86
10	Kezarü-ü	25.538425	94.199879	1093.28
11	Khwilrü	25.560309	94.167082	1232.92
12	Mechorü-ü 1	25.586281	94.186655	1436.83
13	Mechorü 2	25.589410	94.188766	1360.44
14	Melechörü-ü /Meraza Rü-ü	25.547825	94.186554	1216.15
15	Mengurü	25.586249	94.186592	1445.22
16	Merorü-ü	25.537112	94.186865	1216.15
17	Tsaborü	25.548397	94.174831	1572.56
18	Tsüporü-ü	25.550745	94.187506	1248.82
19	Tsürnyü	25.570600	94.177728	1369.66
20	Ziprerü-ü	25.561510	94.167292	1231.22

WATER TANK(S)/ RESERVOIR(S)

1	Tank No. 1	25.556380	94.179345	1624.42
2	Tank No. 2	25.554432	94.180536	1620.27
3	Tank No. 3	25.554180	94.180329	1633.96
4	Tank No. 4	25.557214	94.179241	1627.30
5	Tank No. 5	25.557674	94.179081	1633.34
6	Tank No. 6	25.558890	94.179049	1633.63
7	Tank No. 7	25.559419	94.178732	1632.77
8	Tank No. 8	25.560279	94.178888	1627.07
9	Tank No. 9	25.560654	94.178702	1625.19
10	Tank No. 10	25.561028	94.178572	1622.08
11	Tank No. 11	25.561312	94.178392	1617.92
12	Tank No. 12	25.557982	94.178788	1636.49
13	Tank No. 13	25.558424	94.178288	1637.60
14	Tank No. 14	25.560305	94.177898	1635.48
15	Tank No. 15	25.559588	94.177052	1632.02
16	Tank No. 16	25.559226	94.177448	1638.72
17	Tank No. 17	25.559704	94.177612	1635.81
18	Tank No. 18	25.560122	94.177593	1633.76
19	Water Reservoir 1	25.561656	94.178923	1613.01
20	Water Reservoir 2	25.559419	94.178732	1632.77
21	Water Reservoir 3	25.559419	94.178732	1632.77

7. Total Aquatic Sites of Kigwema Village: 121 Nos.

Sl.no	Local Name	Location/GPS coordinate		
		Latitude (N)	Longitude (E)	Altitude (MAMSL)
IRRIGATION CANAL(S)				
1	Chiedzühi	25.600833	94.100526	1765.00
2	Khuzaka dzüyie	25.607491	94.123145	1458.22
3	Zusahi	25.604300	94.117342	1547.00
POND(S)				
1	Akhoto Kire fishery	25.599893	94.126201	1623.00
2	Medozhalie Yakhro fishery	25.602253	94.128042	1578.00
3	Thepfukelie Phira fishery	25.601859	94.127345	1569.14
RIVER				
1	Dzü/Mezerü	25.629634	94.131935	1085.85
SPRING(S)				
1	Avecha Dzülo	25.604046	94.095143	1833.45
2	Kame Dziilo	25.617996	94.134675	1334.96
3	Kenoyi dzülo	25.605812	94.123734	1498.43
4	Khuba dzükhu	25.607742	94.127828	1564.11
5	Kipho-seca ground Dzülo	25.603564	94.126944	1597.50
6	Kipfükekho	25.606603	94.116552	1505.86
7	Minoleza dzülo	25.611391	94.118523	1481.47
8	Molhounyü dzü	25.602331	94.126753	1591.19
9	Nakhubo dzükhu	25.601149	94.125853	1611.30
10	Ngano khetsa dzülo	25.604762	94.124397	1524.23
11	Pfuchatsie yale	25.602543	94.106732	1710.49
12	Tekhu-dzükhu	25.602400	94.127598	1575.68
13	Thevozabu dzü	25.606121	94.127025	1572.96
14	Tsekhwezu Dzükhu	25.608731	94.128854	1543.32
15	Tsiedizu dzülo	25.608498	94.103177	1924.07
16	Vino Dzükhu	25.593238	94.112241	1906.01
17	Wamoke	25.609440	94.114677	1624.74
18	Wobioko Dzülo	25.601746	94.103339	1741.65
19	Zahukula dzülo	25.601859	94.127345	1569.14
20	Zedeke Dzülo	25.600244	94.103882	1723.13
21	Zuhuyie dzükhu	25.604727	94.126288	1605.48
22	Yole dzü	25.600204	94.099187	1888.42
23	Spring no. 7	25.604082	94.120781	1606.18
24	Spring no. 8	25.601725	94.114548	1622.46
25	Spring no. 9	25.614616	94.114888	1630.66
26	Spring no. 12	25.594116	94.111076	1909.96
27	Spring no. 13	25.592766	94.110834	1949.61
28	Spring no. 14	25.591828	94.110095	1989.59
29	Spring no. 15	25.595036	94.110266	1875.88
30	Spring no. 20	25.603369	94.103204	1758.76

31	Spring no. 25	25.604286	94.117765	1458.65
32	Spring no. 26	25.606812	94.121020	1471.50
33	Spring no. 27	25.608969	94.123388	1426.25
34	Spring no. 28	25.606558	94.122783	1469.43
35	Spring no. 31	25.613236	94.133320	1397.69
36	Spring no. 33	25.622690	94.136939	1301.56
37	Spring no. 36	25.605536	94.129480	1567.07
38	Spring no. 37	25.606173	94.129487	1570.57
39	Spring no. 39	25.603615	94.124189	1632.80
40	Spring no. 40	25.603726	94.124540	1626.99
41	Spring no. 41	25.603001	94.124940	1635.89
42	Spring no. 42	25.603970	94.122279	1637.26
43	Spring no. 43	25.600112	94.124474	1659.13
44	Spring no. 44	25.596608	94.124174	1672.10

STREAM(S)

1	Stream 3	25.594597	94.115809	1828.56
2	Avecha ye	25.603653	94.092965	1833.99
3	Ketsükhu ye	25.600353	94.107299	1720.07
4	Lasara ye	25.599456	94.104278	1743.20
5	Setsa ye	25.594300	94.114711	1830.01
6	Shürho rü	25.603557	94.107585	1708.84
7	Tapa Tale rü	25.603469	94.092195	1834.78
8	Tekhakhükatekhüwü ye	25.600277	94.101863	1751.07
9	Tsathudzü ye	25.601052	94.097129	1817.01
10	Vino dzükhu ye	25.593238	94.112241	1906.01
11	Yoledirü	25.599664	94.106267	1710.87
12	Zabadu ye	25.601192	94.095912	1830.79

WATER TANK(S)/ RESERVOIR(S)

1	Dzübo	25.601583	94.089120	1872.46
2	Army water tank	25.600582	94.101078	1762.03
3	Water tank 1	25.605302	94.126653	1579.58
4	Water tank 2	25.605623	94.125620	1598.53
5	Water tank 3	25.607275	94.128407	1584.12
6	Water tank 4	25.608146	94.128246	1572.58
7	Water tank 5	25.608401	94.127737	1566.19
8	Water tank 6	25.607794	94.127858	1562.39
9	Water tank 7	25.606870	94.129140	1591.23
10	Water tank 8	25.606411	94.128634	1593.46
11	Water tank 9	25.605954	94.128100	1604.00
12	Water tank 10	25.605488	94.128327	1608.04
13	Water tank 11	25.60532	94.127963	1608.44
14	Water tank 12	25.605821	94.129144	1580.34
15	Water tank 13	25.604283	94.129277	1579.35
16	Water tank 14	25.604026	94.128885	1582.14
17	Water tank 15	25.603986	94.128391	1602.41
18	Water tank 16	25.604440	94.128384	1608.61
19	Water tank 17	25.604820	94.128295	1607.33

20	Water tank 18	25.604718	94.127688	1610.15
21	Water tank 19	25.604902	94.127414	1609.41
22	Water tank 20	25.603957	94.127371	1605.21
23	Water tank 21	25.603917	94.126639	1618.65
24	Water tank 22	25.604338	94.126373	1623.38
25	Water tank 23	25.604558	94.126209	1613.41
26	Water tank 24	25.605094	94.125909	1608.62
27	Water tank 25	25.604680	94.125838	1618.00
28	Water tank 26	25.603939	94.126224	1628.91
29	Water tank 27	25.603377	94.124842	1634.74
30	Water tank 28	25.602591	94.124929	1648.64
31	Water tank 29	25.604007	94.124357	1618.94
32	Water tank 30	25.603599	94.123842	1647.27
33	Water tank 31	25.604093	94.122558	1639.51
34	Water tank 32	25.603799	94.121257	1633.60
35	Water tank 33	25.601018	94.124680	1657.31
36	Water tank 34	25.599126	94.124445	1662.27
37	Water tank 35	25.596787	94.124285	1680.02
38	Water tank 36	25.604005	94.128039	1592.76
39	Water tank 37	25.604374	94.126954	1607.39
40	Water tank 38	25.604886	94.127024	1602.22
41	Water tank 39	25.605459	94.127324	1596.76
42	Water tank 40	25.602072	94.125743	1628.46
43	Water tank 41	25.602767	94.125419	1646.69
44	Water tank 42	25.602933	94.125598	1645.27
45	Water tank 43	25.602992	94.125872	1638.56
46	Water tank 44	25.603388	94.125828	1639.56
47	Water tank 45	25.604065	94.126983	1619.61
48	Water tank 46	25.606520	94.127930	1605.21
49	Water tank 47	25.600791	94.115526	1637.02
50	Water tank 48	25.610890	94.112776	1686.92
51	Water tank 49	25.608810	94.113172	1672.94
52	Water tank 50	25.604667	94.110982	1644.05
53	Water tank 51	25.606475	94.111821	1656.61
54	Water tank 52	25.602255	94.107611	1687.07
55	Water tank 53	25.605387	94.115739	1590.83
56	Water tank 54	25.615752	94.132578	1358.12
57	Water tank 55	25.605059	94.130205	1504.68
58	Water tank 56	25.604934	94.130351	1502.32

8. Total Aquatic Sites of Mima Village: 40 Nos.

Sl. No	Local Name	Location/GPS coordinate		
		Latitude (N)	Longitude (E)	Altitude (MAMSL)
BRINE WATER				
1	Piechütu	25.613869	94.180982	928.70
POND				
1	Vilelie Khamo fishery	25.631845	94.180279	1031.00
RIVER(S)				
1	Barü	25.631114	94.177012	1026.14
2	Thirü	25.639753	94.176221	920.66
3	Zarü	25.647417	94.188880	891.58
SPRING(S)				
1	Kekula dzülo	25.629894	94.184685	1119.66
2	Ketho dzükhu	25.606390	94.144332	1533.00
3	Melükhudzü	25.612363	94.143201	1532.00
4	Npru dzü	25.611128	94.144639	1536.40
5	Nyierazou dzülo	25.619045	94.147384	1294.00
6	Whezo dzü	25.612307	94.144584	1507.57
STREAM(S)				
1	Khanyü rü	25.618098	94.150472	1283.11
2	Khusie rü	25.617628	94.147303	1321.54
3	Lahizou rü	25.613651	94.161372	1322.38
4	Terhuopie rü	25.617628	94.147303	1322.54
5	Tholho-I rü	25.620076	94.148100	1287.03
6	Tümozarü	25.624929	94.175349	1063.45
7	Vüri rü	25.621913	94.148085	1280.22
WATER PUMP(S)				
1	Hydro water project	25.645536	94.188901	894.78
2	Tama water pump	25.609487	94.143888	1584.00
3	Tsophima water pump	25.609095	94.143474	1575.20
4	Küsoma water pump	25.610395	94.142458	1588.34
WATER TANK(S)/RESERVOIR(S)				
1	Tank No 1	25.610437	94.145643	1537.25
2	Tank No 2	25.611050	94.139488	1564.35
3	Tank No 3	25.610903	94.141240	1567.27
4	Tank No 4	25.609862	94.143064	1581.93
5	Tank No 5	25.609546	94.143094	1583.86
6	Tank No 6	25.608837	94.143423	1579.23
7	Tank No 7	25.610545	94.143301	1589.37
8	Tank No 8	25.608182	94.142594	1557.22
9	Tank No 9	25.607311	94.144612	1554.15
10	Tank No 10	25.608028	94.144005	1565.54

11	Tank No 11	25.608539	94.144068	1570.93
12	Tank No 12	25.608334	94.144599	1577.00
13	Tank No 13	25.608964	94.144287	1581.26
14	Tank No 14	25.609616	94.143974	1576.36
15	Tank No 15	25.609676	94.144380	1587.24
16	Tank No 16	25.610241	94.144019	1573.25
17	Tank No 17	25.609410	94.145333	1556.74
18	Water Reservoir	25.610424	94.142863	1591.97

9. Total Aquatic Sites of Mitelephe Village: 25 Nos.

Sl.No	Local Name	Location/GPS coordinate		
		Latitude (N)	Longitude (E)	Altitude (MAMSL)
BRINE WATER				
1	Piechütu	25.613869	94.180982	928.70
RING WELL(S)				
1	Ring Well 1	25.628706	94.183952	1089.47
2	Ring Well 2	25.628748	94.183747	1086.78
3	Ring Well 3	25.628724	94.183734	1086.71
4	Ring Well 4	25.625702	94.180945	1083.74
RIVER(S)				
1	Barü	25.639753	94.176221	919.67
2	Thirü	25.639753	94.176221	920.67
3	Zierü	25.647417	94.188880	891.59
STREAM(S)				
1	Temozarü	25.635480	94.184215	1035.65
SPRING(S)				
1	Kekuola	25.630341	94.184843	1077.44
2	Tsiepuwhukha	25.629818	94.184696	1080.51
3	Merüno Dzükhwe	25.625279	94.186360	1078.36
WATER TANK(S)				
1	Tank No. 1	25.625849	94.183305	1122.02
2	Tank No. 2	25.625825	94.183289	1132.58
3	Tank No. 3	25.627135	94.183490	1134.14
4	Tank No. 4	25.626708	94.184513	1127.80
5	Tank No. 5	25.627515	94.184568	1129.65
6	Tank No. 6	25.625338	94.183605	1127.94
7	Tank No. 7	25.624939	94.183724	1126.15
8	Tank No. 8	25.624995	94.182195	1131.59
9	Tank No. 9	25.625039	94.182057	1132.67
10	Tank No. 10	25.624740	94.182238	1130.20
11	Tank No. 11	25.624592	94.181216	1124.47
12	Tank No. 12	25.623834	94.179761	1141.02
13	Tank No. 13	25.625625	94.182006	1113.48

10. Total Aquatic Sites of Pfüchama Village: 20 Nos.

Sl. No	Local Name	Location / GPS coordinate		
		Latitude (N)	Longitude (E)	Altitude (MAMSL)
POND CUM FISHERY				
1	Chatuo Paphino Fishery	25.644005	94.126610	1389.00
2	Lezoto Paphino Fishery	25.641823	94.136843	1300.00
RIVER(S)				
1	Dzücharü	25.647491	94.121271	1248.00
2	Mezerü	25.629634	94.131935	1085.85
SPRING(S)				
1	Chazouma Dzükhü	25.643967	94.127672	1458.33
2	Khranoma Mechü Dzükhü	25.644547	94.131612	1456.75
3	Phididzü	25.640812	94.130182	1409.00
STREAM(S)				
1	Kenoke rü	25.644547	94.131612	1456.75
2	Kevezou rü	25.643967	94.127672	1458.33
3	Khatsi rü	25.640772	94.132997	1425.01
4	Ogakie rü	25.644495	94.126746	1385.00
5	Tsidikou rü	25.641803	94.134160	1431.00
6	Wiza rii	25.632354	94.132706	1149.70
WATER TANK(S) / RESERVOIR				
1	Water tank	25.643877	94.129100	1521.81
2	Water tank	25.643864	94.129446	1523.74
3	Water tank	25.644395	94.129476	1520.39
4	Water tank	25.645109	94.130198	1503.38
5	Water tank	25.643295	94.129561	1505.48
6	Water tank	25.642949	25.642949	1493.41
7	Water tank	25.643816	94.130560	1448.00

11. Total Aquatic Sites of Phesama Village: 32 Nos.

Sl.No	Local Name	Location/GPS coordinate		
		Latitude (N)	Longitude (E)	Altitude (MAMSL)
BOREWELL(S)				
1	Borewell No. 1	25.616432	94.113843	1639.10
2	Borewell No. 2	25.621169	94.109874	1740.09
BRINE WATER				
1	Zakhezu	25.624503	94.089279	1739.70
POND(S)				
1	Chishüzhuzha	25.628239	94.128121	1278.32
2	Nidzüza	25.629049	94.121070	1399.54
RIVER(S)/ STREAM(S)				
1	Dzüchayi	25.625954	94.089756	1696.09
2	Siethoyi	25.633964	94.103958	1502.74
3	Tepebayi	25.608634	94.115930	1604.38
4	Vayi	25.617309	94.098789	1772.14
WATER RESERVOIR(S)				
1	Water Reservoir 1	25.625825	94.094084	1643.10
2	Water Reservoir 2	25.626237	94.090373	1689.92
3	Water Reservoir 3	25.626164	94.090129	1688.28
SPRING(S)				
1	Dzükhü-vadi	25.624693	94.113492	1593.16
2	Kidzü-dzükhü	25.628488	94.117457	1542.65
3	Yadzü-Khuyü-e	25.628514	94.115038	1539.11
4	Zayha dzükhü	25.631436	94.116217	1550.87
WATER TANK(S)				
1	Tank No. 1	25.625912	94.114490	1578.89
2	Tank No. 2	25.626453	94.115831	1585.55
3	Tank No. 3	25.626920	94.116404	1586.50
4	Tank No. 4	25.627301	94.116207	1596.97
5	Tank No. 5	25.627619	94.116084	1599.55
6	Tank No. 6	25.628214	94.116122	1587.48
7	Tank No. 7	25.628393	94.116296	1578.69
8	Tank No. 8	25.628726	94.116381	1573.75
9	Tank No. 9	25.629868	94.115623	1572.96
10	Tank No. 10	25.629999	94.115207	1583.90
11	Tank No. 11	25.630405	94.115460	1591.92
12	Tank No. 12	25.631042	94.115149	1596.36
13	Tank No. 13	25.631317	94.115326	1588.78
14	Tank No. 14	25.631731	94.115473	1573.02
15	Tank No. 15	25.629442	94.115843	1562.92
16	Tank No. 16	25.626824	94.115746	1573.58

12. Total Aquatic Sites of Viswema: 74 Nos.

Sl.No	Local Name	Location/GPS coordinate		
		Latitude (N)	Longitude (E)	Altitude (MAMSL)
BRINE WATER(S)				
1	Krachü za	25.565511	94.158164	1298.83
2	Kikhi za	25.565661	94.158276	1296.20
3	Ngore za	25.551789	94.136744	1666.87
4	Nosele za	25.555278	94.161271	1238.38
POND				
1	Tsüvüza	25.554597	94.144876	1573.24
RIVER(S)/STREAM(S)				
1	Dzüse-l/ Tewhükete	25.570052	94.114906	1680.71
2	Dzüle-l	25.547234	94.127316	1621.97
3	Holeral	25.568600	94.151746	1532.36
	Kerho-l	25.561320	94.151746	1814.72
5	Kelobo-L	25.552091	94.151746	1676.64
6	Kezal	25.563105	94.151746	1596.20
7	Khwi-l	25.588895	94.151746	1085.21
8	Kronkhwel	25.565729	94.151746	1666.44
9	Lbjo	25.542671	94.151746	1625.01
10	Rase-l	25.571382	94.159238	1476.04
11	Tsücho-L	25.549043	94.130517	1633.68
12	Tsüdo-L	25.569906	94.129526	1641.18
13	Vokhu-L	25.566098	94.135439	1663.51
14	Zakha-L	25.556011	94.139122	1662.81
SPRING(S)				
1	Dzüle	25.547209	94.127718	1624.80
2	Kevüdzü	25.560860	94.141362	1703.57
3	Kithodzü	25.568257	94.145467	1581.40
4	Kiphozhü/ Opo-Onu na ratho	25.561812	94.113041	1809.75
5	Phezü	25.585553	94.174375	1154.80
6	Sweba Dzü	25.565979	94.136319	1661.78
7	Tenha Dzü	25.568565	94.147286	1599.50
8	Temekha	25.563055	94.140235	1666.12
9	Tsücho-l	25.562449	94.113205	1645.90
10	Vidün -Thaho	25.551425	94.134343	1685.16
11	Zana	25.551418	94.134449	1684.00
WATER TANK(S)/RESERVOIR(S)				
1	Tank No. 1	25.570153	94.147659	1594.24
2	Tank No. 2	25.567587	94.148044	1611.26
3	Tank No. 3	25.566743	94.147907	1645.16
4	Tank No. 4	25.566879	94.148474	1638.85

GRAPHICAL REPRESENTATION ON VILLAGE-WISE NO. AND TYPE OF AQUATIC SITES

Chart 1: Representation on the no. of Aquatic Sites identified at 12 Villages:

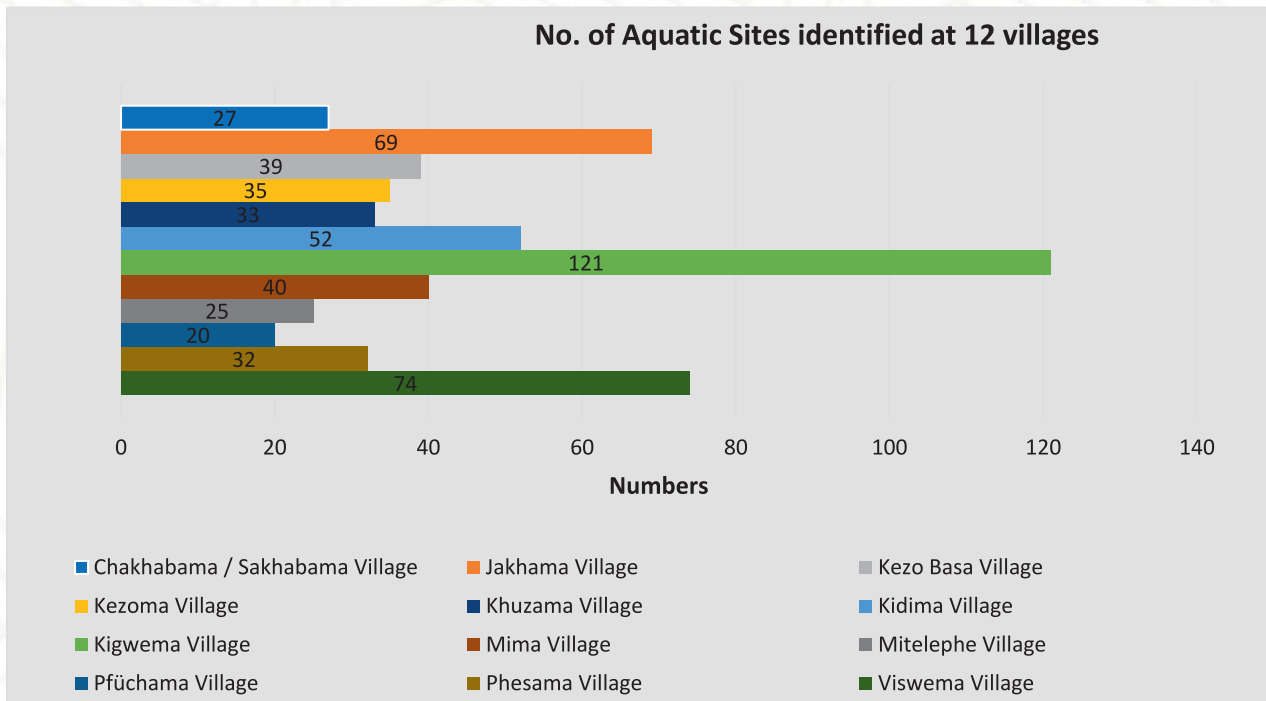
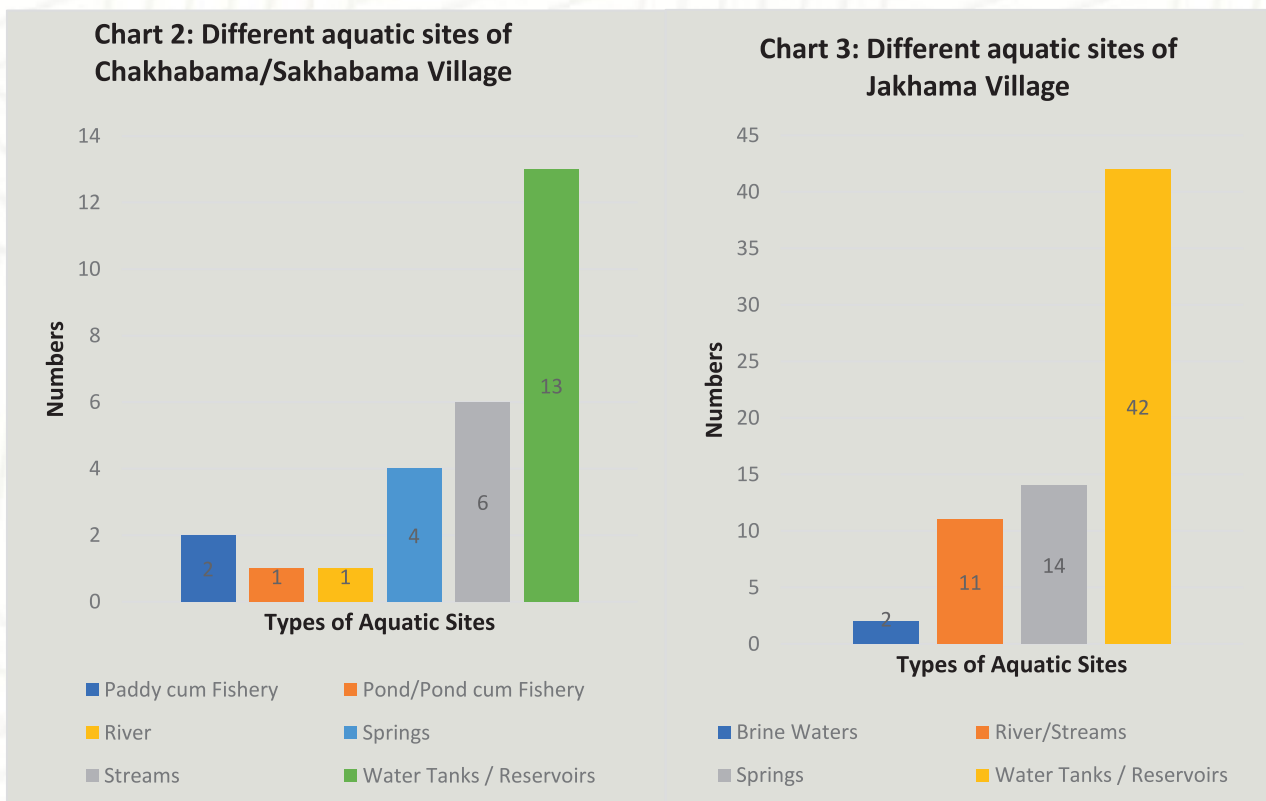


Chart 2 to 13: Representation on different type of Aquatic sites found in a particular village



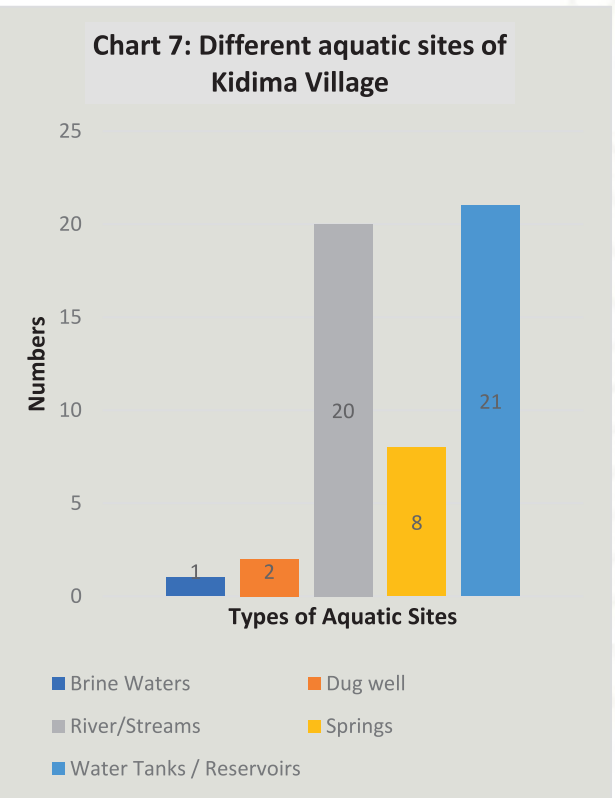
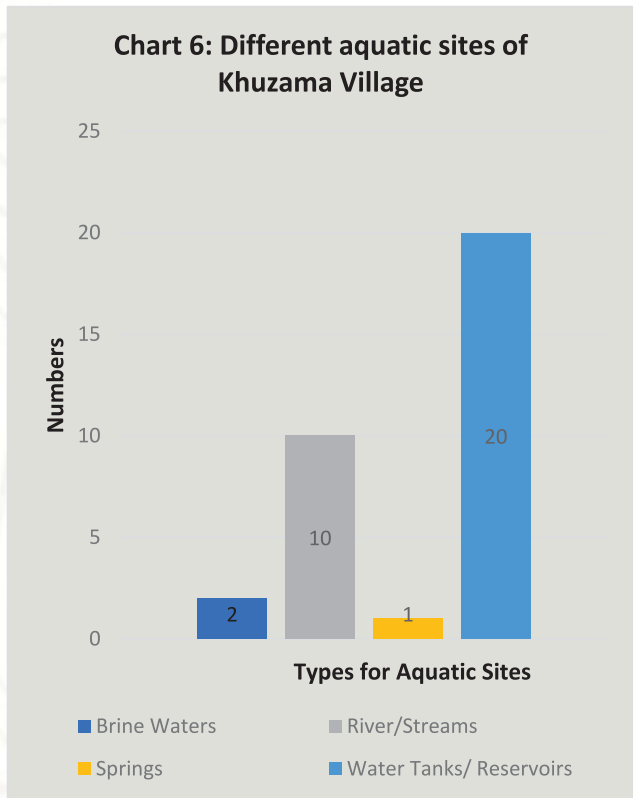
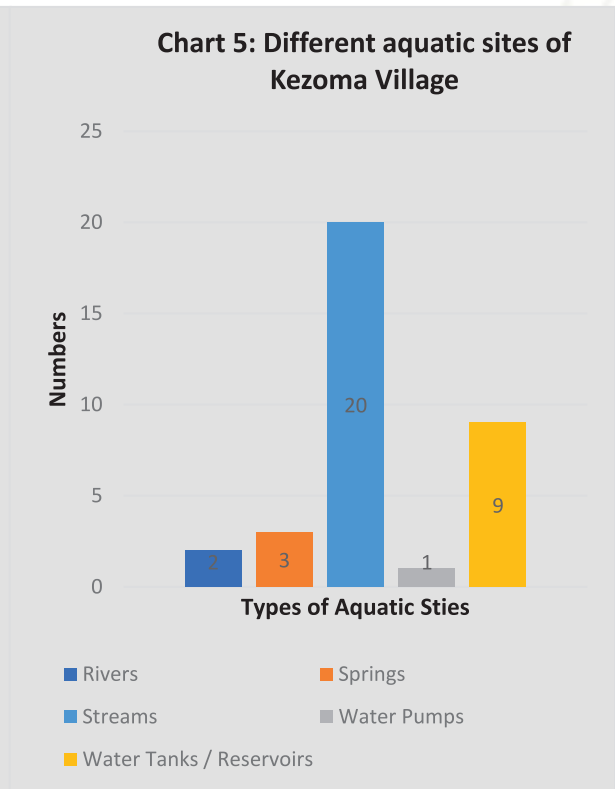
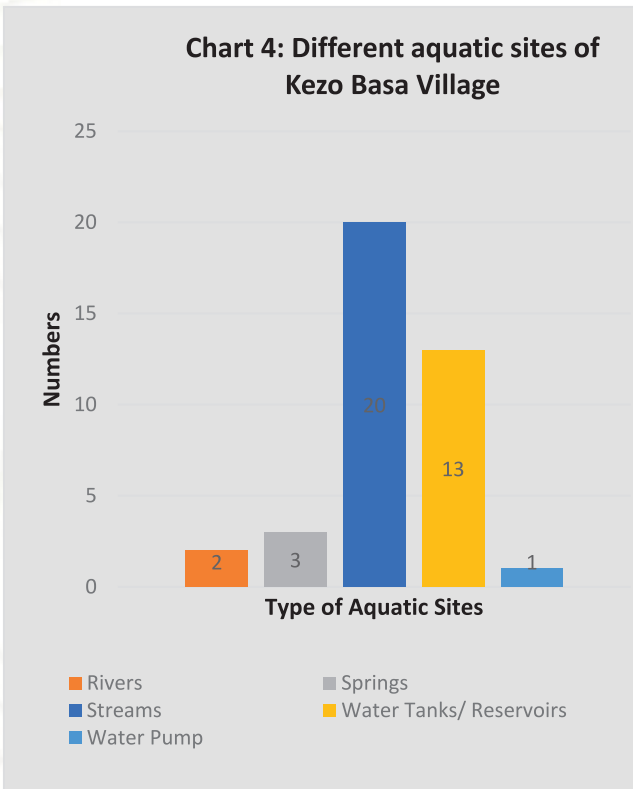


Chart 8: Different aquatic sites of Kigwema Village

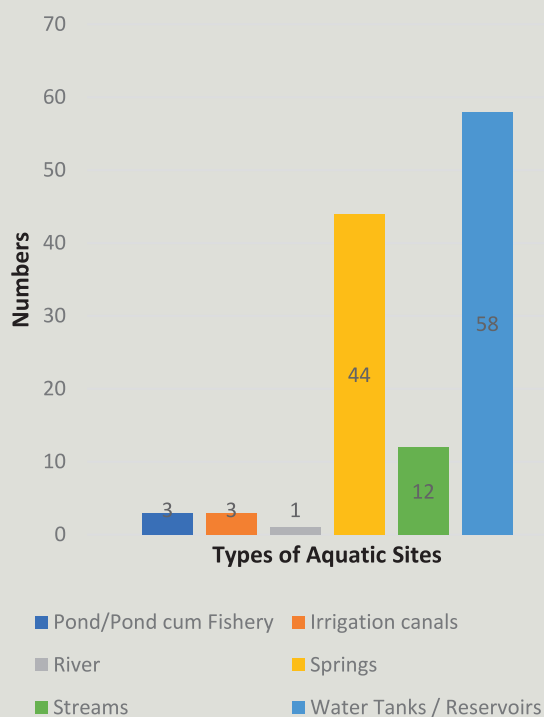


Chart 9: Different aquatic sites of Mima Village

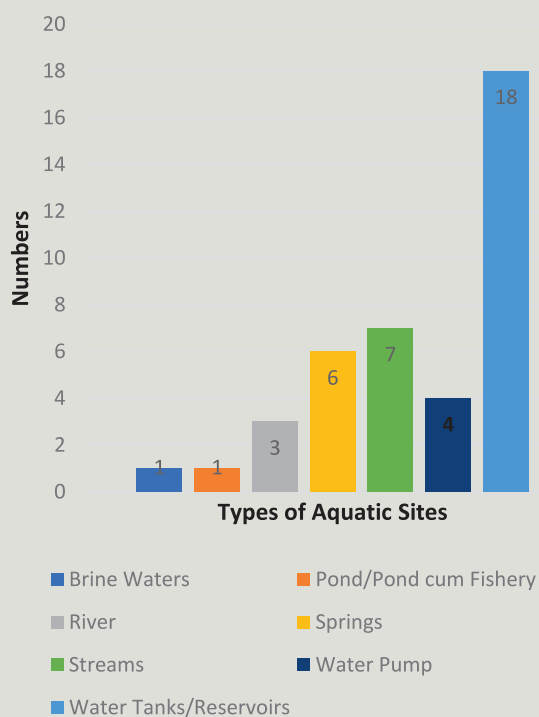


Chart 10: Different aquatic sites of Mitelephe Village

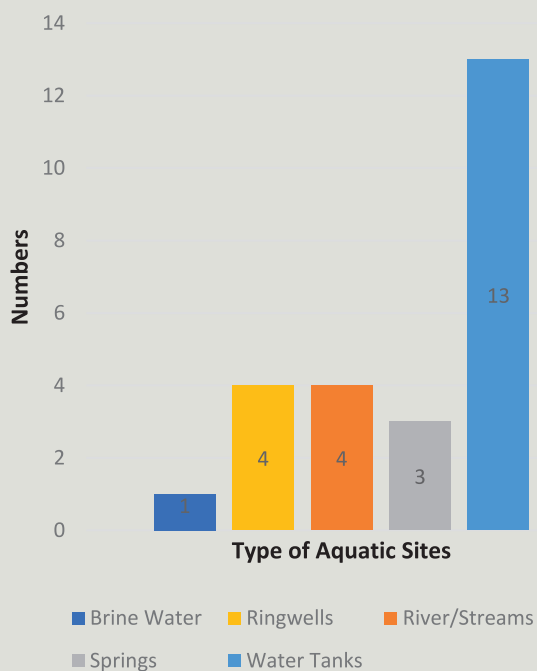


Chart 11: Different aquatic sites of Pfüchama Village

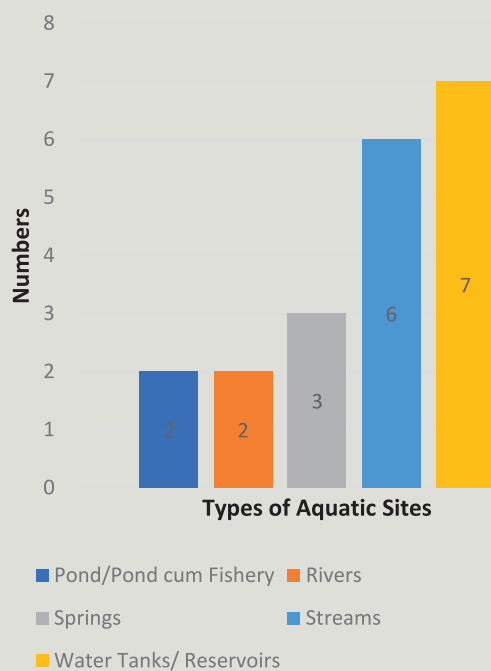


Chart 12: Different aquatic sites of Phesama Village

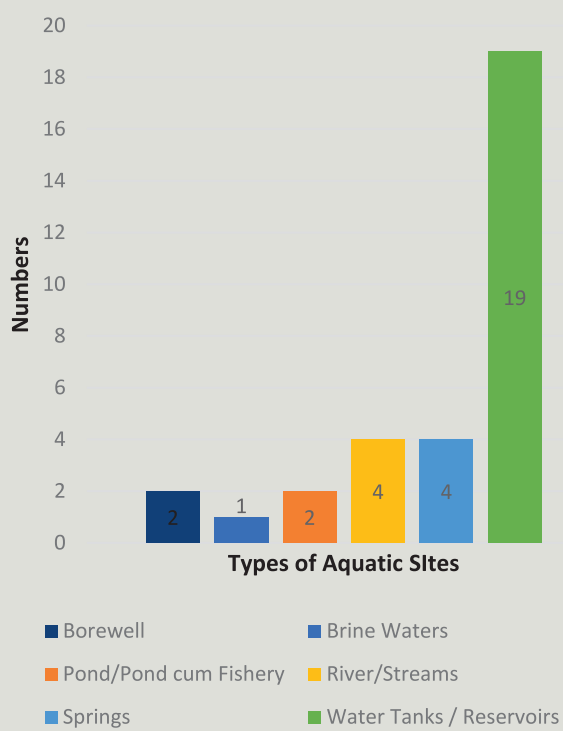
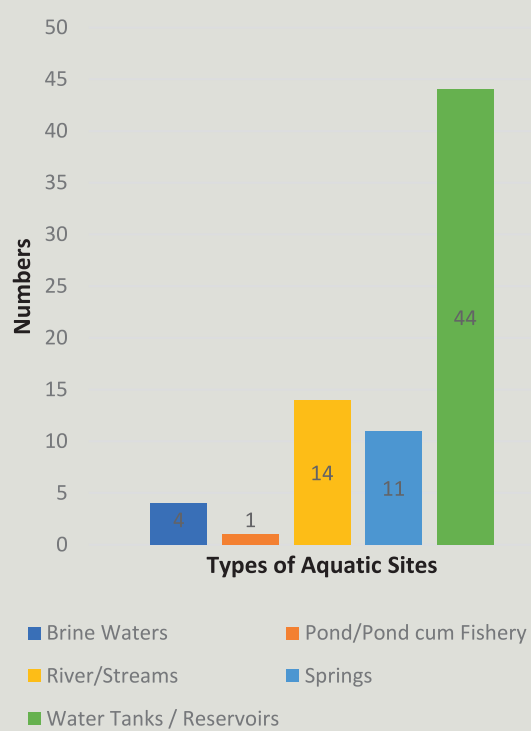


Chart 13: Different aquatic sites of Viswema Village



GRAPHICAL REPRESENTATION ON VILLAGE-WISE AQUATIC BIODIVERSITY

Chart 1: Representation on the no. of Faunal species identified at 12 Villages:

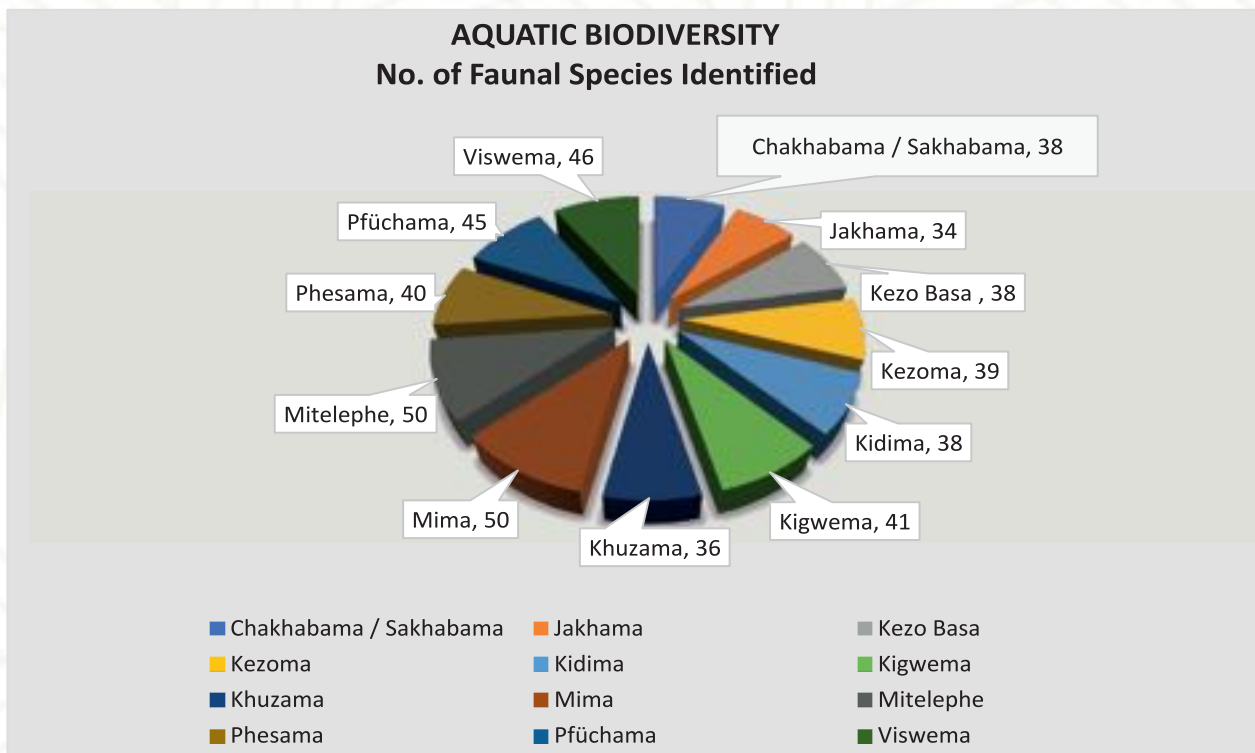
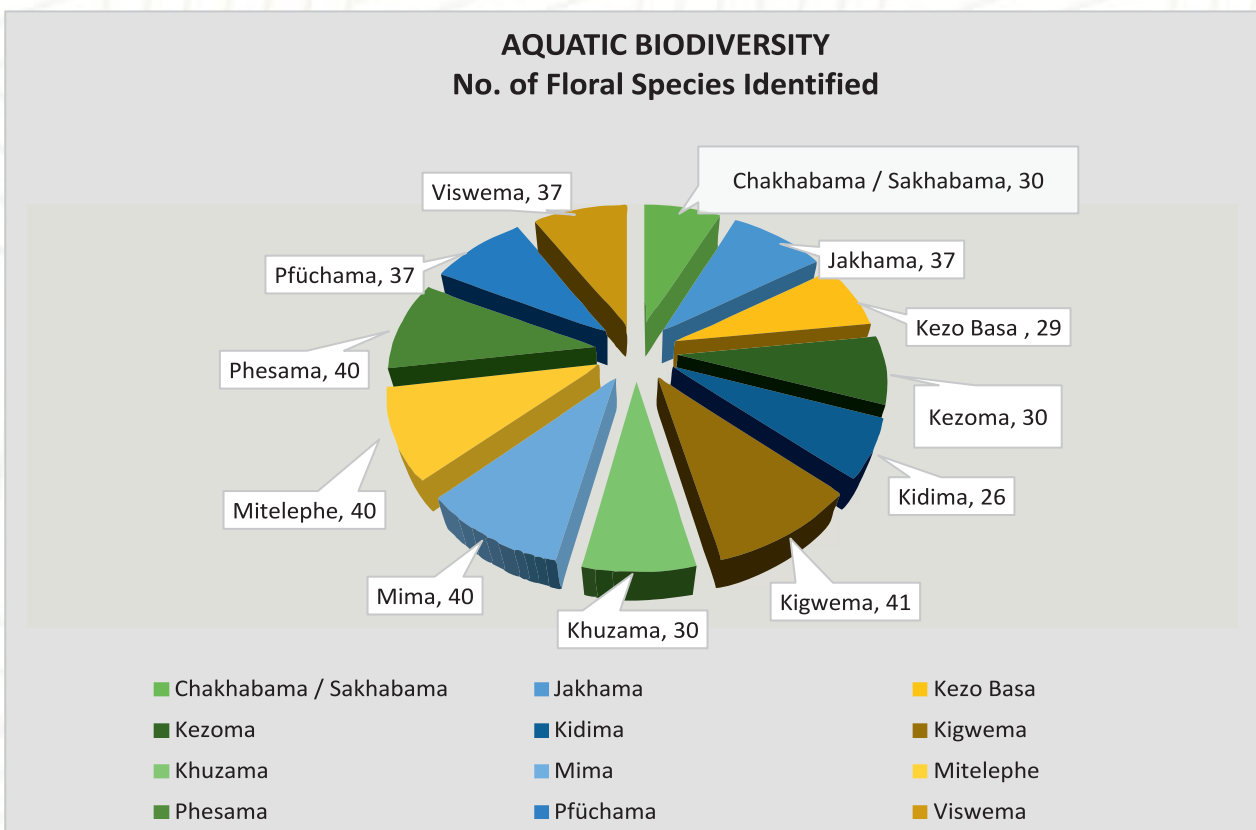


Chart 2: Representation on the no. of Floral species identified at 12 Villages:





ASSESSMENT OF FRESHWATER AQUATIC RESOURCES AND PREPARATION OF PEOPLE'S BIODIVERSITY REGISTER (PBR)



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