

# A Model Framework for Project Idea Note and Project Design Document: Mamit Community REDD+ Project (Mizoram, INDIA)



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On behalf of:



Federal Ministry  
for the Environment, Nature Conservation  
and Nuclear Safety

of the Federal Republic of Germany



NORWEGIAN MINISTRY  
OF FOREIGN AFFAIRS

**A Model Framework for  
Project Idea Note and Project Design Document:  
Mamit Community REDD+ Project (Mizoram, INDIA)**

**2018**

**Indian Council of Forestry Research and Education**  
(An Autonomous Body of Ministry of Environment, Forest and Climate Change, Government of India)  
P.O. New Forest, Dehradun – 248006 (INDIA)



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# Acronyms

BMUB	Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit
CDM	Clean Development Mechanism
CO <sub>2</sub> eq	Carbon dioxide equivalent
D&FD	Deforestation and Forest Degradation
DOE	Designated Operational Entity
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ha	hectare
ICFRE	Indian Council of Forestry Research and Education
ICIMOD	International Centre for Integrated Mountain Development
ICS	Improved Cook Stove
LPG	Liquefied Petroleum Gas
MRV	Measurement, Reporting and Verification
NATCOM	National Communication
NGOs	Non-Governmental Organisations
NTFPs	Non-Timber Forest Products
PDD	Project Design Document
R&D	Research and Development
REDD	Reducing Emissions from Deforestation and Forest Degradation
REL	Reference Emission Level
SIS	Safeguard Information System
UNCCD	United Nations Conventions to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
YMA	Young Mizo Association

## Executive Summary

The Indian Council of Forestry Research and Education (ICFRE) in collaboration with International Centre for Integrated Mountain Development (ICIMOD) implemented a REDD+ Himalayas Project. The Project action is focused on capacity building programme and developing knowledge products on REDD+ at trans-boundary landscape in four Hindu Kush Himalayan (HKH) Countries namely Bhutan, India, Myanmar and Nepal. In India project implementation focussed in North eastern State of India with special inputs and interventions in the State of Mizoram. The proposed Mamit Community REDD+ Project is situated in the Mamit District of Mizoram, India. The project area covers 3,02,500 hectares comprising of 4,300 hectares of very dense forests, 77,200 hectares of moderately dense forests and 1,88,500 hectares of open forests. The project engages 12 indigenous villages of the native *Mizo* tribe. The Mamit District has been chosen as a REDD+ project area due to the presence of long established *Mizo* traditions of forest conservation and natural resource management but also due to traditional practices such as shifting cultivation, fuel wood extraction, extraction of NTFPs, unemployment, lack of knowledge and awareness etc. The project has identified the drivers of deforestation and forest degradation, created awareness and organised capacity building programmes on different aspects of REDD+ have been conducted in the project area.

Enhanced deforestation and forest degradation activities in the project area have not only caused release of substantial quantity of GHG emissions along with creating a threat to the habitats of many threatened and endemic floral and faunal species of the area. The whole area of Mizoram has observed rapid loss of forest cover since the last forest assessment in 2015. The project aims to conserve the forest cover as well as to improve forest quality for a long term hence providing reduction in carbon emissions along with conserving biodiversity of the area. The project is being managed by ICFRE with financial support of ICIMOD, GIZ and BMUB. The project seeks to demonstrate that how the implementation of project activities will help to address the drivers of deforestation and forest degradation with the initiative step in the traditional land use reforms i.e. *jhum*/shifting cultivation so that the forest cover can be improved as well as enhanced.

The key factors which will be monitored through the implementation of project activities include development of methods for calculating, modelling and forecasting carbon storage; development of instruments in preparation for regional REDD+ readiness and working towards harmonization in the region, an exchange of experience and mutual learning on good REDD+ implementation practices are established under South-South cooperation. The project will prove to be successful as it has potential to implicit its activities prolonged in the future among the native tribal *Mizo* communities of the area.

A model framework for project idea note and project design document have been prepared on the basis of information generated under REDD+ Himalaya Project which will be a model framework for developing a REDD+ pilot project with the involvement of local community of Mamit District of Mizoram.



## **1. Background**

Since the adoption of Kyoto Protocol carbon became a tradable commodity to facilitate climate change mitigation actions at global, national and local level. Prior to finalising Kyoto modalities and procedures for carbon trading some of the organisations started pilots and demonstration activities and began with carbon trading outside compliance markets called voluntary carbon markets. Certified Emission Reduction (CER) is the carbon currency of the Clean Development Mechanism (CDM) projects of Kyoto Protocol. The generation of certified emission reductions normally occurs in a step-by-step process that is referred to as a “project cycle”. This cycle normally consists of the following steps:

- (i) Choosing or developing a Methodology: Either an approved methodology must be chosen, or a new one generated, which requires on expert validation.
- (ii) Project design document (PDD): This document presented on a prescribed template in accordance with the standard to be followed. It contains information about the project activity, methodologies used (for creating reference levels, estimating emission reductions and/or removals, etc.), social and environmental impacts (if required), and any public comments.
- (iii) Validation: An independent evaluation of the project/program by an approved entity against the requirements of the standard.
- (iv) Registration: Formal acceptance of the project by the organization providing certification.
- (v) Monitoring: Collecting data and following an approved plan for monitoring (often required in the PDD).
- (vi) Verification: Independent review of monitoring reports, in the case of greenhouse gas (GHG) standards, an ex-post verification that emissions reductions and/or removals claimed actually took place.
- (vii) Issuance: The process by which credits are formally issued and placed in a registry or forwarded to the buyers’ registry.

CDM crediting under the Kyoto Protocol follows the normal procedures outlined above. Most of the domestic offset programmes and voluntary carbon standards follow a procedure similar to CDM and the project cycle outlined above. Standards related to social and environmental concerns also follow similar procedures to the normal project cycle outlined above, but may include a higher level of consultation, review and stakeholder integration into such processes. Since the inclusion of forestry under the Kyoto Protocol mechanism, experience has been gained through afforestation and reforestation (A/R) activities under CDM. CDM in land use sector (A/R) miserably failed as on today the share of A/R CDM projects is less than 1% of the total registered CDM projects .

The land use based climate mitigation approach of ‘Reducing Emissions from Deforestation and Forest Degradation’ (REDD) along with conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon stocks collectively known as REDD+ is now quite mature for implementation by developing countries. The UNFCCC-COP decision on REDD+ includes strong principles of safeguards such as protection of local and indigenous community rights, broad participation within countries, support for adaptation benefits, good governance, poverty reduction, and biodiversity conservation. Warsaw Framework for REDD+

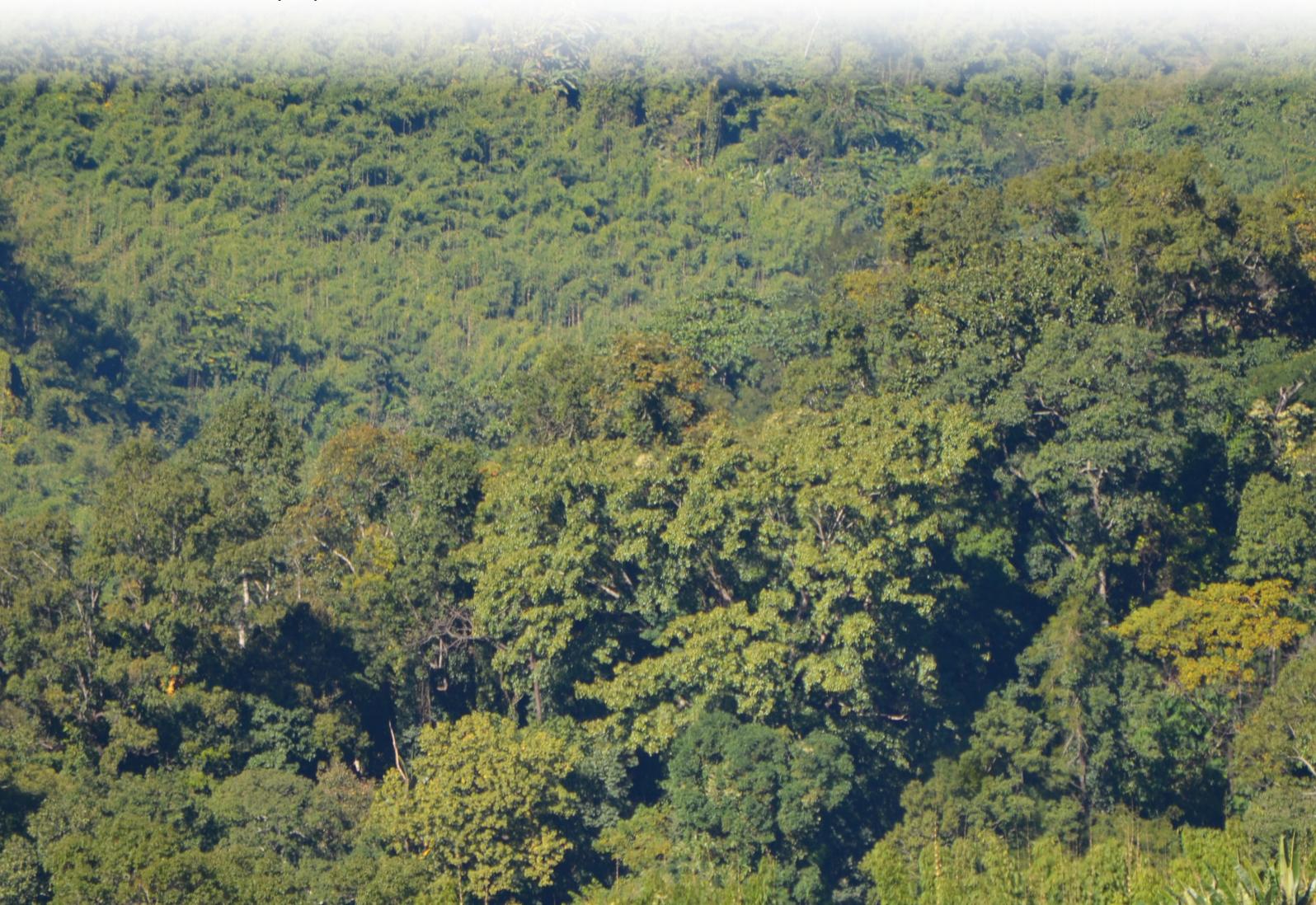
agreed on methodological guidance for various REDD+ related activities. Modalities of REDD+ finance for result based actions has also been approved by the Green Climate Fund (GCF), the financial arm of UNFCCC for climate actions. However, currently under GCF of UNFCCC, REDD+ credits are not generated. Parties are getting REDD+ incentives from GCF in the form of ‘Result Based Payments’ which is not part of the offset mechanism.

An analysis of various standards operating outside compliance market and generating REDD+ Credits are summarised below:

<b>Standard</b>	<b>Background</b>	<b>Objectives</b>	<b>Applicability</b>
Climate, Community and Biodiversity Alliance (CCBA) Standards. ( <a href="http://www.climate-standards.org/">http://www.climate-standards.org/</a> )	Climate, Community and Biodiversity Alliance (CCBA), is a partnership between research institutions, corporations, and environmental groups since 2005.	Standards aim to provide flexible rules and guidance for the development of subnational land-based projects that deliver climate, community and biodiversity benefits in an integrated and sustainable manner.	Intended to be used by project-developing organizations using a project design guidance framework.
Carbon Fix Standard (CFS) ( <a href="http://www.carbonfix.info/">http://www.carbonfix.info/</a> )	Launched in 2007 with support of more than 60 organizations.	Standard promotes that A/R projects in the voluntary carbon market sequester carbon, restore forests, and deliver benefits to people and the environment in a practical, transparent and comprehensive way.	Used by A/R carbon projects—currently mainly in developing countries.
Plan Vivo Standards ( <a href="http://www.planvivo.org/">http://www.planvivo.org/</a> )	Originates from a research project in southern Mexico, initiated in 1994. Developed by the Edinburgh Centre for Carbon Management (ECCM) in collaboration with El Colegio de la Frontera Sur and the University of Edinburgh.	Promotion of sustainable livelihoods among communities, smallholders, and farmers; to provide ecosystem services and promotion of the protection and planting of native and naturalized tree species.	Designed for use by project-developing organizations for land-based carbon projects in developing countries.
SOCIALCARBON ( <a href="http://www.socialcarbon.org/">http://www.socialcarbon.org/</a> )	Developed 1998 by the Brazilian non-profit organization Ecologica Institute originating from a carbon sequestration project in the Brazilian state of Tocantins.	Adding value to GHG mitigation projects through continuous improvement of social, environmental, and economic performances.	Designed for use by project-developing organizations for land-based carbon projects that operate in developing countries.

<p>International Standardization Organization (ISO) ISO 14064-2:2006 ISO 14064-3:2006 (<a href="http://www.iso.org/iso/home.html">http://www.iso.org/iso/home.html</a>)</p>	<p>ISO is a worldwide federation of national standards bodies that designs international standards after a technical committee for a specific sector is established</p> <p>ISO 14064-2, 3:2006 released in 2006.</p>	<p>Provision of a framework for quantification, monitoring, and reporting of greenhouse gas emission reductions or removals on project level and guidance on validation and verification of greenhouse gas assertions.</p>	<p>Intended to be used by standard organizations and project developing organizations for providing evidence of credible and verifiable GHG assertions</p>
<p>Verified Carbon Standard (VCS) (<a href="http://www.v-c-s.org/">http://www.v-c-s.org/</a>)</p>	<p>Initiated in 2005 by The Climate Group, the International Emission Trading Association, and the World Economic Forum as a program for the validation and verification of voluntary GHG mitigation projects.</p>	<p>The VCS program seeks to provide a robust global GHG accounting standard for carbon offset projects participating in the voluntary carbon market.</p>	<p>Intended to be used by project developing organizations of emission reduction projects.</p>

Based on the general requirements of various standards and information generated under REDD+ Himalaya Project; a model Project Idea Note (PIN) and Project Design Document (PDD) have been prepared.





## 2. Project Idea Note

### 2.1 Key Information

<b>Project Title</b>	“Mamit Community REDD+ Project”
<b>Project Location – Country/Region/ District</b>	Mamit District, Mizoram (India)
<b>Project Coordinator &amp; Contact Details</b>	Dr. R.S. Rawat Scientist-in-Charge Biodiversity and Climate Change Division Indian Council of Forestry Research and Education (ICFRE) P.O. New Forest, Dehradun (INDIA) Tel and Fax +91 135-2750296 Email: adg_bcc@icfre.org Website: www.icfre.gov.in
<b>Summary of Proposed Activities</b>	The project attempts to reduce emissions by addressing drivers of deforestation and forest degradation and reduce emission of carbon dioxide through sustainable management of forests with the involvement of local communities. The project activities support communities through various capacity building programmes aim to address drivers of deforestation and forest degradation, promoting income generation activities and livelihood to the local community, creating awareness as well as gender mainstreaming for REDD+ implementation. The project also entails reduction in Greenhouse Gas (GHG) emissions by introducing modern technologies, improvement of existing practices, and promoting permanent cultivation in the project area.
<b>Summary of Proposed Target Groups</b>	The project aims to implement community REDD+ project for local tribal communities of 12 villages of Mamit district of Mizoram (India). The tribal community are mainly dependent on forests for their livelihood, practice shifting cultivation a primitive form of agriculture and use traditional methods of fuel wood collection from forests and usage are specially targeted.

### 2.2 Project Aim and Objectives

The project will envisage the activities addressing the drivers of deforestation and forest degradation in the project area which are actually practicing with traditional agricultural i.e. shifting cultivation, fuel wood collection and NTFPs collection in the REDD+ project area. Thus, in order to achieve this, following outputs and related activities have been identified:

The project seeks to address the drivers of deforestation and forest degradation thus reducing GHG emissions. Capacity building of the local community has been taken as a major activity. Other activities will include promotion of native species of the area; introducing alternative models and techniques targeting traditional practices regarding land use practice, fuel wood and fodder collection, and providing trainings to local community of the project area on various aspects of REDD+.

## 2.3 Proposed Project Area

**Description of Project Location:** Mizoram is one among the eight states of North East India lying between 21°58' to 24°35'N latitudes and 92°15' to 93°29'E longitudes constituting 0.64% of the geographical area of the country and borders with Myanmar and Bangladesh. There are eight administrative districts in Mizoram. Mamit district has been selected as REDD+ project area. The project area constitutes 12 villages having 1583 households with the total population of 8174. Map of project area is given in the Figure 1.

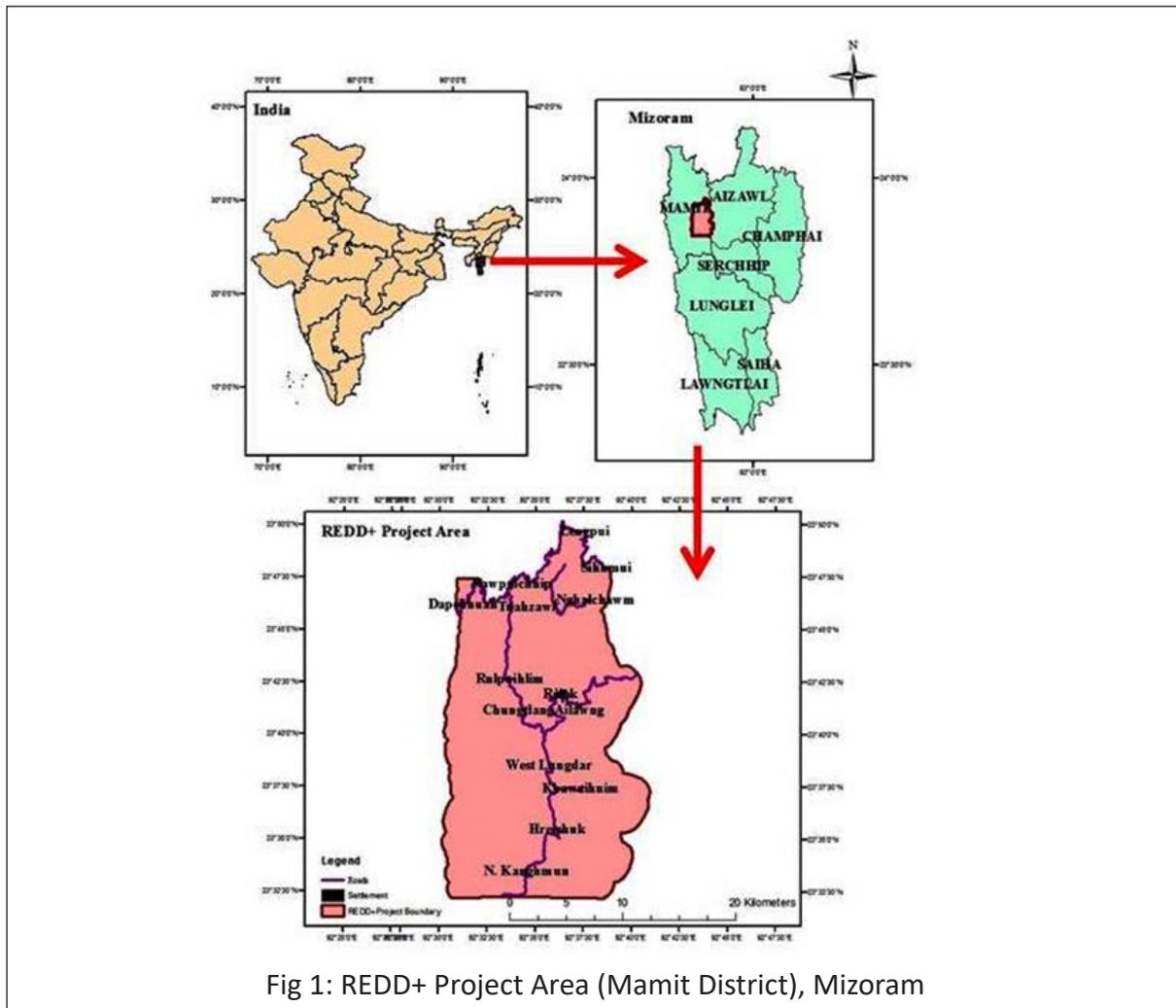


Fig 1: REDD+ Project Area (Mamit District), Mizoram

**Identification of any legally designated/protected conservation areas within, overlapping or adjacent to the project area:** There is no legally designated/protected conservation areas within, overlapping or adjacent to the project area.

**Physical description of the land, habitat types and land use:** The Mamit district in the state of Mizoram has been selected as the REDD+ project area for developing the REDD+ pilot project. The whole area is under tremendous pressure due to extraction of forest resources and traditional agricultural practices i.e. shifting/*jhum* cultivation which has rendered the area to more deforested and degraded condition. Mizoram has 18,186 km<sup>2</sup> of area under total forest and tree cover which constitutes 88.48% of the total geographical area of the state (FSI, 2017), whereas the selected REDD+ project area i.e. Mamit district itself covers 2,700 km<sup>2</sup> of total forest area constituting 89.26% of its total geographical area (Rawat *et al.*, 2017a). However, studies have shown the adverse impact of shifting cultivation resulting in 531 km<sup>2</sup> reduction in forest cover in Mizoram from the previous assessment (FSI, 2017; Rawat *et al.*, 2018).

**Current main categories of land-use:** The current land-use pattern of Mamit district comprises of forests, forest plantation, agriculture, horticulture plantation, jhum, scrubland, wet rice cultivation and water bodies.

**Any known local land degradation processes or trends, including the main drivers of these processes:** During the interaction with local communities, it has been observed that shifting cultivation and fuel wood collection are the major drivers of deforestation and forest degradation in the region. Shifting cultivation has a major contribution towards the economy of local community and 70% of the population of the region are involved in this practice. The per capita per day consumption of fuel wood in the region is estimated to be 31.42 kg causing loss of forest resources. Along with the shifting cultivation and fuel wood collection there are certain other indirect drivers (excessive exploitation of non-timber forest products, unemployment, lack of industries, less connectivity of roads, lack of knowledge and awareness) of forest degradation.

**Description of Socio-Economic Context:** During the survey for identification of drivers of deforestation and forest degradation in the project area reflects that the agriculture is the main source of livelihoods among the most of the local tribal communities. 72 per cent of the individuals were involved in agriculture and other 28 per cent were engaged in government/private jobs, self employed/business and daily wages workers. The average per capita land holding was 2.71 hectare although 22 percent of the families were landless. The landless families are engaged in other occupations like local kitty business and labour works etc. The average annual income of the individual was approximately Rs.1, 00,601. Among all the respondents it has been found that about 61 per cent of the population have annual income ranges from Rs. 10,000 to Rs. 60,000. There is only 13 per cent population which has annual income above than Rs. 1,50,000 with maximum of Rs. 12,00,000.

**Summary of relevant local and national governance structures:** The people of the area are strongly influenced by the civil societies, NGOs such as Young Mizo Association (YMA) as they are linked with traditional and cultural value system of the *Mizo* society. The role of YMA has been observed very crucial in developmental activities in the state of Mizoram.

In Mizoram, the majority of the land comes under the customary rights of the local communities which provide a significant land for shifting cultivation to the local communities. Shifting cultivation is a most common form of agriculture practice in the state. The communities involved in this practice are known as of *Jhumias*. Economic Survey 2015-16 of Government of Mizoram highlighted that the total *jhum* area and the total number of *jhumia* families in Mizoram during 2010-11 were 28562 hectare and 68433 families, respectively. In every village of the Mizoram, there is Village Council (VC) which allots land for shifting cultivation, for construction of houses and for taking up other farming practices etc. to the villagers. The transfer of land ownership occurs within the same tribe with the consent of the village communities. The transfer of land ownership is restricted to locals only. Outsiders are not allowed to own land in the state of Mizoram.

Civil societies, NGOs, Young Mizo Association linked with traditional and cultural value system of the *Mizo* society have strong visible impact on governance at local level. The village councils act as a local body which works under the guidance of local administration and facilitates to take the voice of the communities to the government.

India is one of the few countries with a documented forest policy since 1894. The first forest policy of independent India came in 1952, and it recognized the need of forest conservation and also emphasized the role of forests for meeting needs of industry and society. National Forest Policy of 1988 emphasizes that derivation of direct economic benefits from natural forests is to be subordinated to the principal aim of maintaining ecological balance.

## **2.4 Identification of Target Groups Communities**

The project targets the local *Mizo* tribal community inhabiting the project area which is mainly dependent for livelihood on natural resources from forests. Mizo tribals are the only cultural, ethnic and social groups within the project area.

In Mizoram, the contribution of women in every developmental activity at village council level as well as household level plays an important role towards the income generation, this helps in further improving the quality of life. In terms of using forest resources by the women, it has been observed that the women are involved in collecting fuel wood and other forest resources for the purpose of food, income and as well as for traditional medicins. Further highlighting the aspect of women and economy in the project area, it has been found that most of the shops in the project area are run by women. Women are also involved in small cottage industries e.g. broom making, etc. During the survey it has been found that women are equally contributing in income generation activities at household level i.e. 50% of the overall household income is generated by women. Apart from household level, the women are playing their active role in village councils as well. Women have equal representation in the village council and play equal role in the village council functioning. Because of this dominant role of women in the Mizo society the issue of deforestation and forest degradation can be highly influenced by the roles of women at household as well as local level.

## **2.5 Land Tenure and Carbon Rights**

The local community of the project area are the actual land owners of the community forests. However, the Village Council has control over the village lands and also allots land for shifting cultivation as well as for construction of houses. The land is allotted for tenure of 2-3 years and the size of land depends on the family size. A family of four persons generally receive nearly one hectare of land for shifting cultivation. The individuals practicing terrace farming have their private lands which are heritable and transferable as per the land settlement certificates. However, these lands can only be transferred within the same tribe along with the consent of village communities. No outsider can own land in Mizoram, thus the lands are transferred to locals only (Rawat *et al.*, 2017a).

In consultation with the local communities it has been found that the communities are satisfied with their tribal rights and they are getting each and every benefit in fair and equitable manner. Since the land is owned by the local communities and carbon rights shall also be vested with the communities.

## **2.6 Project Interventions and Activities**

Project level interventions includes capacity building on REDD+ in the form of awareness generation about climate change and role of forest in climate change mitigation, sensitised local communities on benefits of REDD+. Trainings on 'Modalities of REDD+ in Measurement, Reporting and Verification' have been organised for local communities and other stakeholders in all villages under project area of District Mamit in Mizoram. In these training programmes capacity building of all the local communities and frontline staff of Forest Department were done.

Project proposes to promote indigenous plant species for enhancement of forest carbon stocks. For this purpose growth and yield of five common bamboo species of the state have been studied for developing biomass equations. A demonstration plot of bamboo for assessment of

growth and yield study has also been established at Aizawl in Mizoram. 'A Manual on species for implementation of REDD+ activities in Mizoram' has also been prepared for the project area which provide the necessary information on nursery and planting techniques of suitable species for REDD+.

Drivers of deforestation and forest degradation in the state have been studied. Strategies were developed for addressing the drivers of deforestation and forest degradation for the state of Mizoram in consultation with the local communities.

Various activities initiated to address the drivers of deforestation and forest degradation and also for income generation of local communities, like modern turmeric drying and processing facilities, introduction of shaded coffee plantations and introduction of improved cook stoves in the project area.

## **2.7 Identification of Any Non-Eligible Activities**

State REDD+ Action Plan for the state of Mizoram has been prepared through multi stakeholder's consultations process. During the preparation of State REDD+ Action Plan various activities were identified. Some of the activities were directly addressing drivers of deforestation and forest degradation while many activities are supportive of REDD+ actions. A REDD+ Working Group was established at Rain Forest Research Institute, Jorhat (Assam) to initiate and scale up REDD+ actions in the North-Eastern states of India. The working group will act as an information hub for REDD+ in the region. Exposure visit of local community members to the neighboring state to showcase the benefits of permanent kind of agriculture practice was undertaken.

## **2.8: Long Term Sustainability Drivers**

The proposed REDD+ activities aim to develop long-term approaches which ensure that the project activities will continue in the absence of any external revenues. Thus, before arriving to this point, the project activities will focus in building long term sustainability of the project activities by promoting local ownership of the project management which will include:

- Capacity building will generate self employment opportunities among communities which will help to empower them in later stages.
- Making the communities aware about the benefits of conserving and protecting forests is a long-term process to mitigate climate change in broader terms.
- Promotion of agroforestry will not only prove productive in nature, reduce shifting cultivation, enhance tree cover but will also provide employment as well as economically uplift the community.
- Adopting solar lights/lamps/cookers and introduction to modern technology such as improved cook stove/biogas will save energy, reduce emissions and also financially support the local people.
- Adoption of new technologies such as turmeric processing technique will help in value addition, support rural economy, save time and above all will enhance forest regeneration of shifting cultivation lands.
- Better livestock management practices will protect forests from degradation, create employment, support financial needs and daily requirements of rural people of the area.
- Involvement of local communities and State Forest Department for a common cause i.e. conservation and management of forests along with creating employment and uplifting economic status of people, will establish new and healthy long-lasting relations.

## **2.9 Applicant Organisation and Proposed Governance Structure**

*Project Organisational Structure:* Project will be governed by Indian Council of Forestry Research and Education (ICFRE), P.O. New Forest, Dehradun in collaboration with its regional centre Forest Research Centre for Bamboo and Rattan, Aizawl (Mizoram) and Mizoram Department of Environment, Forests and Climate Change.

ICFRE shall have overall project administrative responsibility. Registration and recording as per given standard and sale agreements; managing the project finance, coordinating, data recording and monitoring, negotiating sales of carbon certificates and reporting to the Standard shall be done by the ICFRE

Normally ICFRE shall not seeking technical support and training in planning and implementing project activities as it is capable of accomplishing these tasks with its available human resource. ICFRE may seek external technical support/project development services if exigency arises. ICFRE shall also act as project coordinator.

*Legal Status:* ICFRE is an autonomous body of the Ministry of Environment, Forest and Climate Change, Government of India and registered under Societies Registration Act, 1860.

*Brief History:* Scientific forestry in India started with the establishment of Forest Department in 1864 and subsequently Imperial Forest Research Institute was created in 1906 for catering to the specialised forestry research needs of the country. Later on the establishment was renamed as Forest Research Institute and Colleges to become the premier institution of forestry research.

In 1986, the Government of India reorganized the structure of forestry research in India and created a body named Indian Council of Forestry Research and Education (ICFRE), which was subsequently granted autonomy in 1991. Indian Council of Forestry Research and Education (ICFRE) is the apex autonomous and independent body in the national forestry research and education system. The organization and its regional institutes are working for the holistic development of forestry research at national level.

ICFRE has been granted Observer Status of UNFCCC in view of work done in the area of climate change and forestry. ICFRE was also accredited as DOE for validation and verification of CDM Projects by UNFCCC for sectoral scope 14: Afforestation and Reforestation. However later on ICFRE withdrew its DOE status. ICFRE regularly prepares forestry component of NATCOM/BUR and other land based reporting for international agencies like UNFCCC and UNCCD.

The mandates of ICFRE includes planning, promoting, conducting and coordinating research, education and extension on all aspects of forestry for ensuring scientific management of forests, improvement in forest productivity through genetic and biotechnological research, bioremediation of degraded lands, efficient utilization of forest products, conservation of biodiversity, integrated management of pests and diseases, and adaptation and mitigation potential of forests.

*Summary of current activities including details of scale and range:* ICFRE has pan India presence with its 9 institutes and 5 centres located in different parts of the country. ICFRE has developed technologies and protocols in the fields of silviculture, agro-forestry, biotechnology, tree improvement, wood technology, forest products, and environment management which have been extended to user agencies. Ecological restoration of degraded lands, wastelands and mines has been successfully accomplished. Topical research by the Council enhances public confidence in the ability of forest managers and researchers to successfully handle challenges related to natural resource management.

The Council has observer status with UNFCCC and UNCCD and is actively involved in the deliberations on climate change, land degradation and biodiversity in the international forums. ICFRE has been organising side events at UNFCCC on topical issues of forest and climate change, REDD+, afforestation and reforestation etc.

*Personnel to be involved in the project with details of relevant skills and experience:* Project Co-ordinator: Dr. R.S. Rawat, Scientist In-charge, Biodiversity and Climate Change Division at ICFRE Hqs, Dehradun

Qualifications and Experience: M.Sc. (Botany), and Ph.D. (Forestry), presently working as Scientist In-charge of Biodiversity and Climate Change Division of ICFRE Hqs. He has more than 20 years of research experience in restoration ecology, cold desert ecology and biodiversity conservation, forest and climate change and REDD+. Trained in CDM validation, verification and certification: GHG Auditor training. Successfully completed Quality Management System and Internal Auditor training course based on ISO 9001:2008 requirements.

## **2.10 Community-Led Design Plan**

The Mamit Community REDD+ Project has been initiated under ICIMOD-GIZ supported trans-boundary landscape programme titled 'REDD+ Himalaya: Developing and using experience in implementing REDD+ in Himalaya' implemented by ICFRE in Mizoram. Community participation in the project has already been initiated in the form of various community led actions such as up awareness capacity buildings on REDD+, scaling of modern turmeric processing facilities, introduction of shaded coffee plantations and introduction of improved cook stoves to the communities. These actions have been initiated in consultation with communities and target groups.

## **2.11 Additionality Analysis**

The periodic reports of the 'India State of Forest Report' reflects that the Mizoram is one of the states in North East India where forest cover is decreasing despite government policy and programmes of promoting forest conservation. The proposed REDD+ project is additional as it addresses the drivers of deforestation and forest degradation in the project area by creating and strengthening the community based forest management system as well as delivering strategies, feasible techniques and financial support to ensure long-term sustainability of the activities.

The project activities have attempted to overcome following barriers:

- Lack of awareness has led the communities for unsustainable resource utilization as it has been traditionally bind to their primitive system. The project helped in creating awareness among the indigenous people on climate change, role of forest conservation and REDD+. Improved agriculture practices and modern equipments that can help reducing GHG emissions.
- Lack of income opportunities which has caused poverty and unemployment is the major problem due to which shifting cultivation cannot be restricted, hence creating income generation opportunities have been introduced.
- Influencing communities to adopt suitable technologies have always been challenging as economic gains come first and environment comes next if seen from community's perspective.

- Improving natural resource management practices at community level along with keeping objectives of REDD+ at forefront is very challenging and project activities attempt to overcome those challenges.

However, these barriers can be removed by various interventions through project activities such as capacity building programmes, awareness campaigns, trainings, improved management practices, improved land use practices and income generating activities etc. which along with socially uplifting the indigenous society, will eventually address drivers of deforestation and forest degradation and reduce GHG emissions in the project area. The project activities will further create revenues which will further support the activities so that in the absence of external funding support, the REDD+ project objectives may be continued.



## 3. Project Design Document

### 3.1 Aims and objectives

The project seeks to reduce the GHG emissions by addressing the drivers of deforestation and forest degradation through implementation of REDD+ activities. Farmers are practicing traditional agriculture practices (shifting cultivation), fuel wood collection and NTFPs collection in the REDD+ project area.

The project attempts to address the drivers of deforestation and forest degradation thus reducing GHG emissions, improvement in ecosystem services and providing alternate income generation activities to the participating communities. Capacity building of the local community has been taken as a major approach. The approach will include promotion of native species of the area; introducing alternative models and techniques targeting traditional agriculture practices providing trainings on improved technologies and income generation activities to local people of the project area.

The project activity is outcome of ICIMOD supported trans-boundary 'REDD+ Himalaya Project' that aims to build capacity of REDD+ in transboundary landscapes of India, Nepal, Bhutan and Myanmar. In Indian context, ICFRE is focussed on REDD+ capacity building in North-East region of the country through development and implementation of REDD+ Himalaya project focussing mainly on trainings, sharing of knowledge and technology.

The work done under REDD+ Himalaya Project resulted in enhanced capacity of stakeholders at different levels through appropriate means of training, research and communication. Further standards, guidelines and inclusive protocols on REDD+ mechanism are also developed. Project resulted in creating an enabling environment for a community oriented REDD+ in the north eastern region of India.

### 3.2 Site Information

**Project location and boundaries:** Mizoram is one among the eight states of North East India lying between 21°58' to 24°35' N latitudes and 92°15' to 93°29' E longitudes. There are 8 administrative districts in Mizoram. Mamit district has been selected for the REDD+ project. The project area constitutes 12 villages having 1583 households with the total population of 8174. Map of project area is given in the Fig 2.

**Description of the project area:** The project is located in the state of Mizoram in North-East India. The project area has international boundaries with Myanmar and Bangladesh and has inter-state boundaries with state of Assam, Manipur and Tripura. The rich forest diversity of the area spreading over 42,288.96 ha of land which includes Tropical semi-evergreen forests and Tropical moist deciduous forests (Table 1). Figure 3 represents the forest type map of the REDD+ project area.

Table 1: Forest Type of Project Area as per Champion and Seth (1968)

S.N.	Forest Type	Sub-Forest Type	Area (ha)
1	Group 2 Tropical Semi-Evergreen Forest	2B/2S1 Pioneer Euphorbiaceous Scrub	80.69
2	Group 2 Tropical Semi-Evergreen Forest	2B/C2 Cachar Tropical Semi-Evergreen Forest	22691.43
3	Group 3 Tropical Moist Deciduous Forest	2/2S1 Secondary Moist Bamboo Brakes	16220.15
4	Group 3 Tropical Moist Deciduous Forest	3C/C3b East Himalayan Moist Mixed Deciduous Forest	3296.69
<b>Total</b>			<b>42288.96</b>

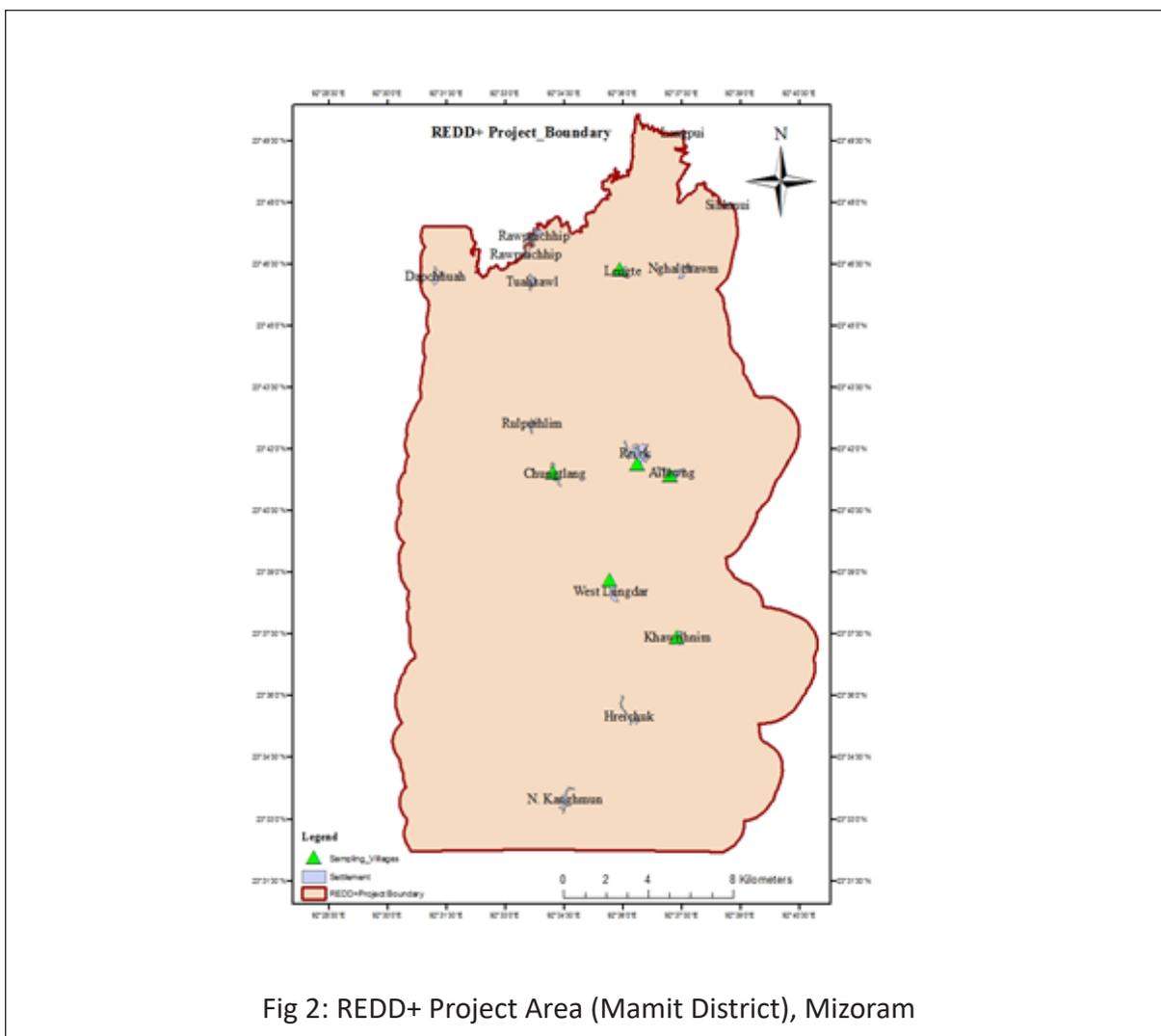
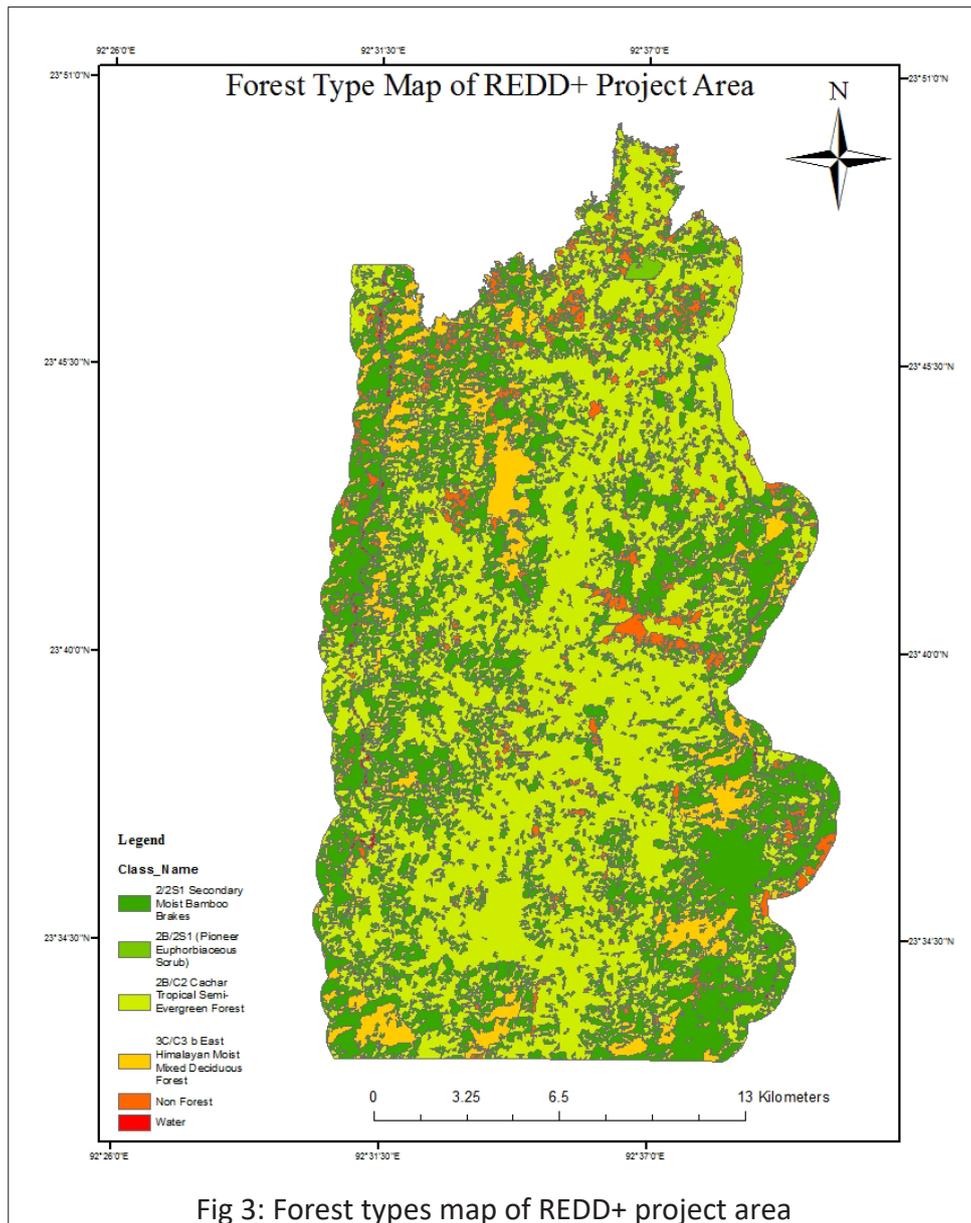


Fig 2: REDD+ Project Area (Mamit District), Mizoram

The climate of the study area is influenced by cyclonic disturbances as well as topography hence causing heavy torrential rains during the months of May to September and lesser rain during winter season (January), with an average rainfall between 200-300 cm/year. The temperature ranges from 25°C to 30°C in summer and 11°C to 23°C during winters (Rawat et al., 2017a).



**Presence of endangered species and habitats:** The geography of Mizoram favours migration and introduction of several floral and faunal species. Mizoram acquires a diverse range of endemic and rare species. The natural beauty of the area is enhanced together by lush green forests and habitats of wide variety of flora and fauna.

The faunal varieties include mammalian species such as *Capricornis rubidus* (the state animal Red Serow), *Nemorhaedus goral* (Goral), *Panthera tigris* (Tiger), *Panthera pardus* (Leopard), *Neofelis nebulosi* (Clouded Leopard), *Prionailurus bengalensis* (Leopard Cat) and *Ursus thibetanus* (Asiatic Black Bear), primates such as *Hoolock hoolock* (Hoolock gibbon), *Trachypithecus pileatus* (Capped Langur), *Trachypithecus phayrei* (Phayre's Leaf Monkey), *Macaca arctoides* (Stump Tailed Macaque), *Macaca nemestrina* (Pig Tailed Macaque), *Macaca assamensis* (Assamese Macaque), *Macaca mulatta* (Rhesus macaque) and *Nycticebus coucang* (Slow Loris).

Lesser carnivores such as *Aonix cinereus* (Small Clawed Otter), *Lutra lutra* (Common Otter), *Mustelia kathiah* (Yellow Bellied Weasel), *Mustela strigidorsa* (Striped Backed Weasel), *Arctonix collaris* (Hog badger), *Martes flavigula* (Yellow Throated Marten), *Melogale moschata*

(Large Toothed Ferret Badger), *Melogale personata* (Small Toothed Ferret Badger), *Herpestes palustris* (Small Indian Mongoose), *Herpestes edwardsii* (Grey Mongoose), *Herpestes urva* (Crab Eating Mongoose), *Prionodon pardicolor* (Spotted Linsang), *Arctictis binturong* (Binturong), *Arctogalidia trivirgata* (Small Toothed Palm Civet), *Paguma larvata* (Himalayan Palm Civet), *Paradoxurus hermaphroditus* (Common Palm Civet), *Viverricula indica* (Small Indian Civet) and *Viverra zibetha* (Large Indian Civet), herbivores such as *Rusa unicolor* (Sambar), *Muntiacus muntjak* (Barking Deer), *Naemorhedus* (Goral), *Capricornis rubidus* (Red Serrow) and large herbivores such as *Elephas maximus* (Elephant) and *Bos gaurus* (Gaur).

The region falls within two global biodiversity hotspots i.e. the Himalaya and Indo-Burma, along with supporting diversity of people and culture. The study area has the highest density of clouded leopard than other areas where it is found. Since the area is inadequately protected, many endangered species found in the forests of project area are in the risk of being threatened. The project implementation helps to conserve as well as extend the wildlife habitat by addressing shifting cultivation and other drivers of degradation in the study area.

Out of more than 500 species of birds in Mizoram, four have been declared critically endangered, one endangered, five vulnerable, seven near threatened and nine restricted, Among the rare species of birds, Chinese Babax is found only in Mizoram within the Indian limits.

Prominent floral and faunal species of Mizoram are given in Table 2. Following species of plants and animals have been notified as 'Rare, Threatened and Endangered' which are either extinct or are on the verge of extinction from the state:

**Plant Species:** *Jasminum wengeri* (Jasmine), *Mantisia wengeri* (Dancing girl), *Paphiopedilum spicerianum* (Lady's slipper), *Paphiopedilum villosum* (Lady's slipper), *Aquilaria malaccensis* (Agarwood), *Hydnocarpus kurzii* (Chaulmoogra), *Dalbergia pinnata* var *acaciifolia* and *Cinnamomum aromatic* (Cassia or Chinese cinnamon)

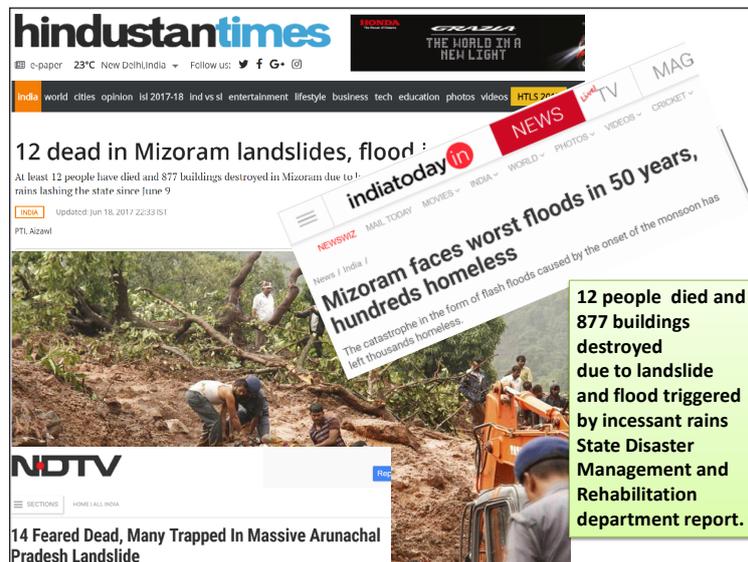
**Animal Species:** *Rhinoceros sondaicus* (Javan Rhinoceros), *Dicerorhinus sumatrensi* (Sumatran Rhinoceros), *Felis marmorata* (Marbled Cat), *Pardofelis temminckii* (Asiatic Golden Cat or Temminck's Golden Cat), *Arctictis binturong* (Binturong or Asian or Palawan Bearcat), *Prionodon pardicolor* (Spotted Linsang), *Mustela kathiah* (Yellow-bellied weasel) and *Ursus malayanus* (Sun bear)

Table 2: Prominent species of Flora and Fauna of Mizoram

Species	Flora
<b>Tree species</b>	<i>Dipterocarpus turbinatus</i> , <i>D. retusa</i> , <i>Terminalia myriocarpa</i> , <i>T. chebula</i> , <i>T. bellerica</i> , <i>Aphanamixis wallichii</i> , <i>Michelia champaca</i> , <i>Haldina cordifolia</i> , <i>Mitragyna rotundiifolia</i> , <i>Lagerstroemia speciosa</i> , <i>Chukrasia tabularis</i> , <i>Artocarpus chama</i> , <i>Bombax ceiba</i> , <i>Gmelina arborea</i> , <i>Albizia chinensis</i> , <i>Schima wallichii</i> , <i>Neolamarckia cadamba</i> , <i>Quercus semiserrata</i> , <i>Mesua farrae</i> , <i>Rhododendron arboreum</i> , <i>Quercus griffithii</i> , <i>Quercus serrata</i> etc.
<b>Bamboo species</b>	<i>Melocanna baccifera</i> , <i>Dendrocalamus longispathus</i> , <i>Bambus tulda</i> , <i>Pseudostachyum polymorphum</i> , <i>Arundinaria callosa</i> , <i>Dendrocalamus sikkimensis</i> , <i>D. giganteus</i>
<b>Cane species</b>	<i>Zalaca baccarii</i> , <i>Plectocarpia khasiana</i> etc.
<b>Palm species</b>	<i>Barassus flabellifera</i> , <i>Licuala peltata</i> , <i>Typha elephantiana</i> , <i>Pandanus odoratissimus</i> , <i>Caryota mitis</i> , <i>Wallichia densiflora</i>
<b>Orchids</b>	<i>Renanthera inschootiana</i> , <i>Vanda coerulea</i> , <i>Mantisia saltoria</i> , <i>M. wengerii</i>

Species	Fauna
Mammals	<i>Capricornis rubidus, Nemorhaedus goral, Panthera tigris, Panthera pardus, Neofelis nebulosi, Prionailurus bengalensis, Ursus thibetanus</i>
Primates	<i>Hoolock hoolock, Trachypithecus pileatus, Trachypithecus phayrei, Macaca arctoides, Macaca nemestrina, Macaca assamensis, Macaca mulatta, Nycticebus coucang</i>
Cat Family	<i>Panthera tigris, Panthera pardus, Neofelis nebulosi, Prionailurus bengalensis, Felis chaus, Catopuma temminckii, Pardofelis marmorata, Prionailurus viverrinus</i>
Lesser Carnivores	<i>Aonix cinereus, Lutra lutra, Mustelia kathiah, Mustela strigidorsa, Arctonix collaris, Martes flavigula, Melogale moschata, Melogale personata, Herpestes edwardsii, Herpestes urva, Prionodon pardicolor, Arctogalidia trivirgata, Paguma larvata, Paradoxurus hermaphrodites, Viverricula indica, Viverra zibetha</i>
Large Herbivores	<i>Elephas maximus, Bos gaurus</i>
Herbivores	<i>Rusa unicorn, Muntiacus muntjak, Naemorhedus, Capricornis rubidu</i>

**Other critical factors affecting project management e.g. roads, infrastructure, climate hazards:** Although the project area lacks proper network of road and other infrastructure because of which economic activities are at low pace, however, there are no perceived critical factors that can affect project management. In recent past state of Mizoram suffered from extreme climatic event like excessive rainfall resulting in massive landslides and loss of human life in the region.



Mizoram: 2017 land slides and floods in media and press

**Recent changes in land use and environment conditions:** The increasing demands for food, fodder and energy due to rise in poverty and population growth has resulted in enhanced pressure on forests. Also, the expansion of agriculture in the forest lands due to shifting cultivation is of major concern. The consequences of these can be observed in various India State of Forest Reports published by the Forest Survey of India which shows decline in forest cover of the state in past assessments with the given reason being shifting cultivation and developmental activities (Table 3). Figure 4 represents the forest cover trend in Mizoram which shows the impact on forests due to deforestation and forest degradation activities.

Table 3: Forest area cover change in Mizoram (km<sup>2</sup>)

Year	VDF	Change	MDF	Change	OF	Change	Forest Cover	Change
2005	133	-	6,173	-	12,378	-	18,648	-
2009	134	1	6,251	78	12,855	477	19,240	592
2011	134	0	6,086	-165	12,897	42	19,117	-123
2013	138	4	5,900	-186	13,016	119	19,054	-63
2015	135	-3	5,800	-100	12,782	-234	18,717	-337
2017	131	-4	5,861	61	12,194	-588	18,186	-531

\*VDF=Very Dense Forests; MDF=Moderately Dense Forests; OF=Open Forests  
(FSI, 2005; 2009; 2011; 2013; 2015; 2017)

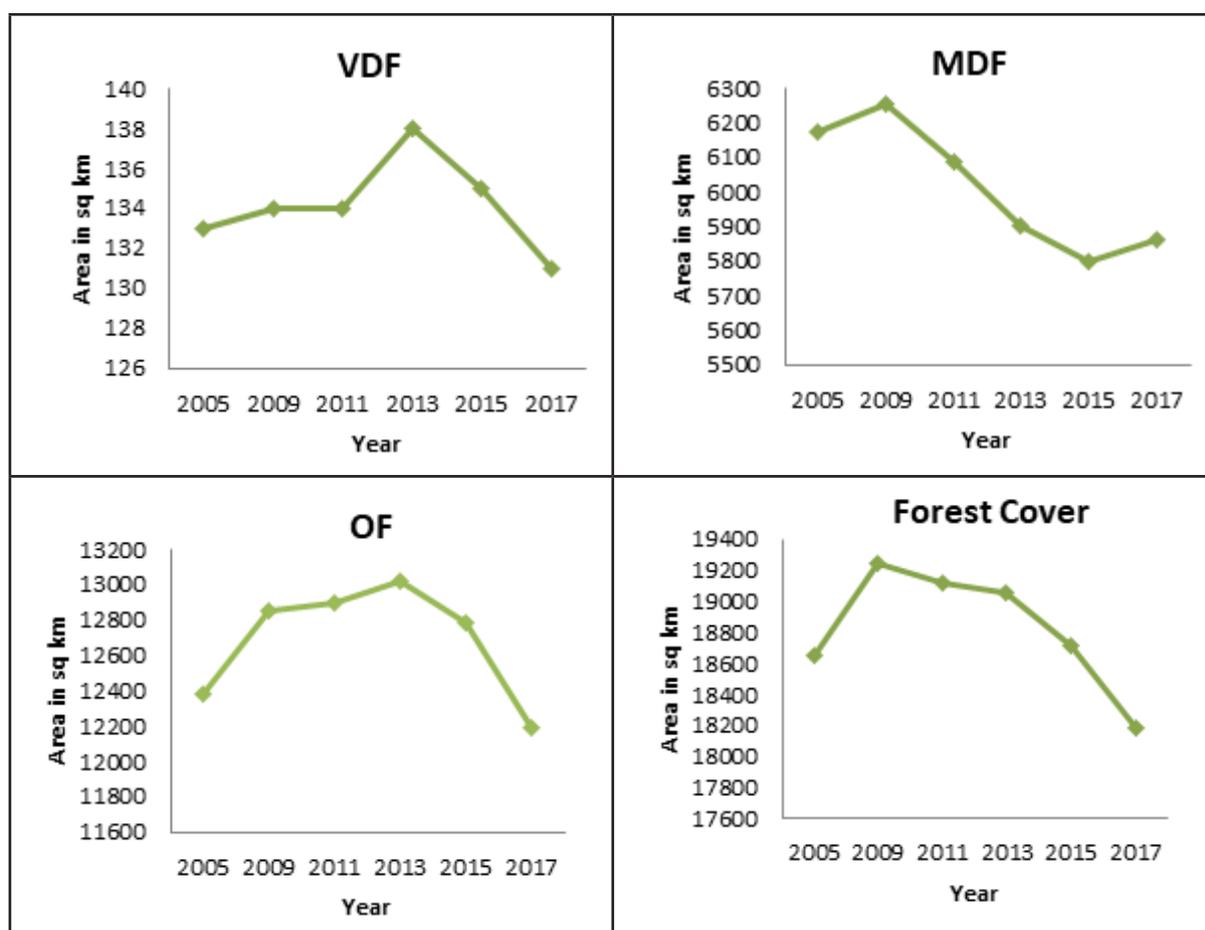


Figure 4: Forest cover change in Mizoram since 2005

District Mamit has shown regular decrease in its forest cover for past consecutive 3 assessments (2017, 2015 and 2013) of Forest Survey of India (Table 4)

Table 4: Forest cover of District Mamit for past three assessments of Forest Survey of India

Assessment Year	Very Dense Forest	Moderately Dense Forest	Open Forest	% of Geographical Area	Change as compared to previous assessment
2017	43	772	1885	89.26	-27 (2015)
2015	43	654	2044	90.20	-18 (2013)
2013	41	644	2090	91.77	-26 (2011)

**Drivers of Deforestation and Forest Degradation:** Rawat *et al.* (2017a) identified the drivers of deforestation and forest degradation which fall into two categories i.e. Direct/Proximate Drivers and Indirect/Underlying Drivers (Table 5).

Table 5: Drivers of Deforestation and Forest Degradation

Direct/Proximate Drivers	Indirect/Underlying Drivers
<ul style="list-style-type: none"> <li>• Shifting cultivation</li> </ul>	<ul style="list-style-type: none"> <li>• Unemployment</li> </ul>
<ul style="list-style-type: none"> <li>• Fuel wood collection</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of industries</li> </ul>
<ul style="list-style-type: none"> <li>• Excessive timber harvesting</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of knowledge and awareness</li> </ul>
<ul style="list-style-type: none"> <li>• Extraction of NTFPs</li> </ul>	<ul style="list-style-type: none"> <li>• Less connectivity of roads</li> </ul>

(Rawat *et al.*, 2017a)

**Shifting Cultivation:** Agricultural expansion by the means of slash and burn practice i.e. shifting cultivation in the project area has been taking place from a long time. The dependency of more than 60% of the rural population of the area on agriculture has resulted in more pressure on *jhum* lands and above all on forests (Rawat *et al.*, 2017a). This unscientific practice of agriculture has drastically placed forests and associated species on vulnerable state. The reduction in *jhumming* cycle is creating more problems by disturbing the ecological regime of the forests and rejuvenation of the particular disturbed forest landmark.

**Unsustainable Fuelwood and Timber Collection:** The dependency and more resource utilization due to increasing population demands as well as lack of awareness are adding to the drivers of deforestation and forest degradation. The low economical gains and traditional practices are also responsible for unsustainable fuelwood as well as timber collection. The study done by Rawat *et al.* (2018) suggests that 61.73% of rural population of the study area prefer fuel wood as the primary source of energy. However, the consumption of fuel wood in the villages near to the forests is 100%. The study also reveals that the shifting cultivation lands alone contribute 44.44% of the fuel wood collection with an average monthly fuel wood collection of 489.66 kg/individual in the study area. The resulted toxic emissions will not only add on to the GHGs but on the other hand it will also affect the health of the people of the area. Similarly excessive harvesting of timber is not only causing deforestation and degrading the quality of forests but also disturbing habitats of several endangered species found in the area.

**Extraction of NTFPs:** The unscientific harvesting and over-exploitation of NTFPs as well as lesser regulations on collection and sale of non timber forest products have decreased carrying capacity of forests. Traditional livelihood practices of the native population have increased the chances of wild species for being vulnerable.

**Unemployment:** The lesser employment opportunities, limited alternative income generating opportunities and lesser financial gains result in unstable economy and more dependency on forests for easy availability of resources and sustaining livelihoods of the rural communities which resulted in deforestation and forest degradation in the study area.

**Lack of Industries and Less Connectivity of Roads:** The relation between deforestation and forest degradation and development is intricate, however, the absence of road connectivity does not suffice the food and other requirements thus enhance the need for clearing forests. The lack of income opportunities due to lack of industries in the study area has also enhanced dependency on forest resource which led to deforestation and degradation of forest wealth.

Lack of Knowledge and Awareness: Age old farming practice of shifting cultivation, unscientific and unsustainable methods for NTFP collection, dependency on forest for fuel wood and other purposes etc., lack of knowledge and awareness among the local community which is adding to the factors of deforestation and forest degradation.

### **3.3 Community and Livelihoods Information**

**Participating communities/groups:** The Mamit Community REDD+ project involve Mizo people, an indigenous tribe in the state of Mizoram. Majority of the population speak the native Mizo language. Nearly 87% Mizo people follow Christianity, whereas Buddhism forms the religious minority group in Mizoram. The residents of Mizoram come under the class of Scheduled Tribes i.e. the '*Mizo*' which locally means '*highlanders*'. Mizo and English are the principal and official languages. Since the Mizos do not own any script, they use Roman alphabets. In the project area, there are 1,583 households representing a population of 8,174 with an average household size of 5.2 members.

**Socio-economic context:** During the survey for identification of drivers of deforestation and forest degradation reflects that the agriculture is the main source of livelihoods among the most of the local communities. 72 per cent of the individuals were involved in agriculture and other 28 per cent were engaged in government/private jobs, self employed/business and daily wages workers. The average per capita landholding was 2.71 hectare. However, 22 percent of the families were landless. The landless families are engaged in other occupations like local kitty business and labour works etc.

As it has been mentioned earlier that the main occupation of the target groups is agriculture and the main crops grown are rice and turmeric etc. The average landholding under agriculture in the project area is 1.47 ha. The farmers also rear pigs, hen and cows to supplement their requirements. The average annual income of the individual was approximately Rs.1, 00,601.30. Among all the respondents, it has been found that about 61 per cent of the population have annual income ranges from Rs. 10,000 to Rs. 60,000 which is less than USD 1 per day. There is only 13 per cent population which has annual income above than Rs. 1,50,000 with maximum of Rs. 12,00,000.

Poverty, unemployment and lack of awareness are common problems in all the villages of the project area. Thus, developmental activities, capacity building programmes, income generation activities, promotion of feasible technologies and improved livestock management practices have been prioritized in the study area.

Study related to REDD+ in Mamit district shows heavy dependency on natural resources i.e. forests by the means of agriculture i.e., shifting/*jhum* cultivation. The area has observed population expansion along with reduced carrying capacity of the forests. Mizoram has observed 23.5% decadal growth in population between 2001 and 2011 with majority of the population (71.6%) dependent for their livelihoods on agriculture. Thus, fulfilling demands of increasing population with sole dependency on traditionally agricultural practices i.e. shifting cultivation has not only resulted in poverty but has also enhanced deforestation and forest degradation. Shifting cultivation is largely responsible for reduction in 531 km<sup>2</sup> of the forest cover of the area between 2015 and 2017 assessment (FSI, 2017).

Economic Survey 2015-16 of Government of Mizoram highlighted that the total *jhum* area and the total number of *jhumia* families in Mizoram during 2010-11 were 28562 hectare and 68433 families, respectively.

In the project area, major summer crops grown are potatoes, maize, beans, local grown vegetables which is followed by cultivation of rice, ginger, turmeric, orange, banana, *Parkia roxburghii* and betel nut. The major winter crops include cultivation of mustard, other crops, bamboo, betel nut, ginger and orange. As all the major crops are grown on shifting cultivation lands which are enhancing deforestation and forest degradation and as per the local people's perceptions, since rice is the staple crop of the *Mizos* hence adoption of wet rice cultivation will not only increase rice productivity but can also help in abating problem of shifting cultivation in the area. Similarly adoption of terrace farming/permanent cultivation in the state has also been suggested by the community people.

The project communities have low education status as only 14% of the respondents have education till high school and 67% respondents have education till primary standard whereas a few percentage (8%) of respondents hold Bachelor and higher degree. Thus, only 12.96% of community members hold government jobs and rest 8.64% respondents are engaged in small business or employed as daily waged labours. Due to lesser knowledge and awareness among the minimal wage earning groups, their dependency on forests for NTFPs extraction, fuel wood for cooking and heating purposes is more. Most of the families are not able to afford LPG due to high prices hence rely on traditional cook stoves which are also increasing forest degradation in the project area as well as enhancing GHG emissions (Rawat *et al.*, 2018).

**Land tenure and ownership of carbon rights:** The indigenous people of the project area are the actual land owners of the community forests. However, the Village Council has control over the village lands and also allots land for shifting cultivation as well as for construction of houses. The land is allotted for tenure of 2-3 years and the size of land depends on the family size. A family of four persons generally receive nearly one hectare of land for shifting cultivation. The individuals practicing terrace farming have their private lands which are inherited and transferable as per the land settlement certificates. However, these lands can only be transferred within the same tribe along with the consent of village communities. Since no outsider can own land in Mizoram, thus the lands are transferred to locals only (Rawat *et al.*, 2017a).

#### **Types of land ownership in the state of Mizoram:**

**Land Settlement Certificate:** Land settlement certificates are issued to the individuals who are involved in some kind of permanent farming practices i.e. terrace farming, wet rice cultivation, and horticulture plantations etc.

**Periodic Pass:** For the purpose of gardening or other form of cultivation over a period of 5 years and one time periodic pass is given for the individuals of the state.

**Land Lease Pass:** This is a temporary pass which can be issued to the Government Departments, Organizations or Corporate Bodies without any time bound limit. Hence it can be withdrawn at any time if there is any breach in their working against their rights.

**Revenue Pass:** This type of pass is issued to the individual for building temporary house and later on with the consent of competent authority it can be converted to land settlement certificate.

Apparently there are no conflicts or potential issues related to land tenure as most of the land are under community control and village council issues permits for shifting cultivation periodically to the families.

Carbon Rights: During consultations with the local communities it has been found that the communities are satisfied with their tribal rights and they are getting each and every benefit in fair and equitable manner. Since the land is owned by the communities carbon rights shall also be vested with the communities/ Village Councils. Village council shall be authorized to develop its own system for equitable distribution of carbon benefits in accordance with their customary laws.

### **3.4 Project Interventions & Activities**

**Summarise the project interventions:** Project level interventions began with capacity building on REDD+ in the form of awareness generation about climate change and role of forest in climate change mitigation, sensitized local communities about benefits of REDD+. Trainings on 'Modalities of REDD+ in Measurement, Reporting and Verification' for local communities and other stakeholders in all villages under project area of District Mamit in Mizoram have been organised. In these training programmes, capacity building of all the local communities and frontline staff of Forest Department on REDD+ MRV were done.

Project proposes to promote indigenous plant species for enhancement of forest carbon stocks. For this purpose growth and yield of five common bamboo species of the state have been studied for developing biomass equations. A demonstration plot of bamboo for assessment of growth and yield study has also been established at Aizawl in Mizoram. 'A Manual on species for implementation of REDD+ activities in Mizoram' has also been prepared for the project area.

Drivers of deforestation and forest degradation in the state have been studied. Strategies were developed for addressing the drivers of deforestation and forest degradation for the state of Mizoram in consultation with the local communities.

Various activities initiated to address the drivers of deforestation and forest degradation and also provide alternate income generation to the local communities, like modern turmeric drying, processing facilities, introduction of shaded coffee plantations and distribution of improved cook stoves were introduced. Feasibility study for identifying, adopting and/or developing appropriate technology for improved cook stoves, solar energy and fodder/agroforestry/ livestock management was conducted. Farmers in the project area cultivate turmeric that fetches good price in market. In order to motivate farmers for turmeric cultivation and providing them livelihood opportunities, a turmeric processing unit was provided to one community, another community was provided with a solar drying unit for drying of raw turmeric. Training at local level for improved cook stoves, solar energy and fodder/agroforestry/ livestock management were imparted to the communities. The aforesaid interventions contributed to ecosystem restoration and rehabilitation Improved land management and helped in controlling forest degradation

**Summarise the project activities for each intervention:** Project activities for each intervention are given in Table 6:

Table 6: Intervention wise project activities

S. N.	Intervention Type	Project Activity	Description	Target Groups
1	Enhanced Capacity of Stakeholders	Developed a strategy to address drivers of deforestation and forest degradation at state and local level	Under the project drivers of deforestation and forest degradation were identified. Based on this study strategies were prepared to address drivers of deforestation and forest degradation	Indigenous Communities
		Identification of adequate planting material and tested in demonstration plots	Development of demonstration plot of Bamboo species at study site	
		Conducting training on REDD+ MRV	Training programmes on REDD+ MRV were organised for communities in all the villages falling in project area.	
		Up scaling of existing alternative models for shifting cultivation based on natural resource management and land use practice	Establishment of Shaded Coffee Plantations in community forest area of study site.  Exposure visit of farmers to nearby areas of permanent terracing/ land use practices  Provided technical know how of alternative models for improved cook stove, solar energy, agroforestry and livestock management	
		Feasibility study for indentifying, adopting and/ or developing appropriate technology for improved cookstoves, solar energy and fodder/agroforestry/ livestock management	Feasibility study was conducted for identification, adoption and development of appropriate technology for ICS, solar energy and fodder/agroforestry/ livestock management  Establishment of Turmeric drying and processing facilities at study site	
		Training on natural resource management, improved cook stoves, solar energy and fodder/ agro-forestry/ livestock management	Training to the community on natural resource management ICS, solar energy, agroforestry and livestock management	
		Scoping for promoting bamboo plantations in addressing REDD+ objective	Allometric equations for 5 major bamboo species growing in the area developed for estimation of biomass	
		Developing strategy for high conservation networks and biodiversity indicators to be used in REDD+	Preparation of strategy document on high conservation networks and biodiversity indicators to be used in REDD+ implementation in Mizoram.	
		Extension of REDD+ activities	Preparation and distribution of flyer/ brochures  Organisation of training on gender mainstreaming for REDD+ implementation and extension  Preparation of REDD+ documentary film	
Develop manual for suitable REDD+ species	A manual on suitable tree species for REDD+ of Mizoram prepared			
2	REDD+ implementation	State REDD+ Action Plan for Mizoram	A State REDD+ Action Plan (SRAP) for the state of Mizoram was prepared	Government of Mizoram

**Effects of activities on biodiversity and the environment:** The proposed activities will have implicit effects on biodiversity conservation within the project area. Along with climate change mitigation benefits, forest conservation by implementing project activities will prevent the loss of biodiversity. The adoption of agroforestry and promotion of native species will help in enrichment of ecology of the area. It is foreseen that the project activities will not only enhance the biodiversity but will also maintain the ecological niche of many floral and faunal species in the study area.

Reduction in deforestation and forest degradation activities through land use change and positive alterations in age old practice of farming, collection of fuel wood and NTFPs will promote regeneration and restoration of floral species in the area. The project also seeks to upscale alternative energy techniques and to improve livestock and agriculture management practices so that pressure on the forests can be reduced and forest health can be improved.

The strategies made for addressing the drivers of deforestation and forest degradation are aimed at restoring forests and reduce GHG emissions. The project will follow the prescribed REDD+ safeguards during its implementation phase.

Since the project activities will have minimal negative effects on the environment, addressing the drivers of deforestation and forest degradation will contribute to enhanced forest quality in the project area. The agro-forestry techniques will promote the native species of the area, thus reducing the dependency on forests as well as will open opportunities of income and employment for rural people. Thus, overall the suggested REDD+ activities in the area will promote positive long-term mitigation impacts with assured forest growth and reduced emissions.

### **3.5 Community Participation**

**Participatory project design:** At the beginning of the REDD+ Himalaya Project a Project inception workshop was organised in Aizawl in the capital city of the state of Mizoram in January 2016. Representatives of the Mizoram Government, Officers from State Forest Departments, research organisations, academia, and civil society participated in the project inception workshop. During the inception workshop it was decided to implement the project activity in the district Mamit. During the implementation of REDD+ Himalaya Project, local communities of 12 villages under the project were sensitized on climate change and how REDD+ can contribute to climate change mitigation and adaptation along with other co-benefits. Communities were motivated for REDD+ programme. Capacity building programmes of community members were done on various aspects of REDD+.

The project target group is indigenous *Mizo* tribal community inhabiting the 12 villages of the project area. The villagers are mainly dependent for livelihood on natural resources from forests. Mizos are the only cultural, ethnic and social groups within the project area. The Village Council members have been regularly involved during the implementation of project activities.

Socially Mizo society respects and inculcates human values. There are no socially excluded communities in the project area. Women are equal partner in decision making process and running the family and business affairs. In Mizoram, the contribution of women in every developmental activity at village council level as well as household level plays an important role towards the income generation, this helps in further improving the quality of life. In terms of using forest resources by the women, it has been observed that the women are involved in collecting fuel wood and other forest resources for food, income and for traditional medicines

as well. Further underscoring the role of women in economy in the project area, it has been found that most of the shops in the project area are run by women. Women are also involved in small cottage industries e.g. broom making. During the survey it has been found that women are equally contributing in income generation activities at household level i.e. 50% of the overall household income is generated by women. Apart from household level, women also play active role in village council affairs as well. Women have equal representation in the village council and play equal role in the village council functioning. Owing to their prominent role of women in the Mizo society, the issue of deforestation and forest degradation can be influenced by women at household as well as local/regional level.

Civil societies, NGOs, Young Mizo Association (YMA) patronising traditional and cultural value system of the Mizo society have strong visible impact on governance at local level. The village councils act as a local body which works under the guidance of local administration and facilitates to take the voice of the communities to the government.

**Community-led implementation:** All the local communities will involved in implementation of the activities for getting the benefit of REDD+ through various enhancement activities.

**Community-level project governance:** At every step for further project related interventions consent of the community/ Village Council will be taken through a stakeholders consultation Process.

Mizo community has strong grievance redressal mechanism through Village Council meetings and also through intervention of Young Mizo Association (YMA). Further a project related grievance redressal system shall be developed in collaboration with Village Council and YMA.

### 3.6 Ecosystem Services and Other Project Benefits

#### Carbon benefits:

Table 1 – Carbon benefits					
	1	2	3	4	2-(1+3+4)
Intervention type (technical specification)	Baseline carbon uptake / emissions i.e. without project (t CO <sub>2</sub> eq/ha)	Carbon uptake/ emissions reductions with project (t CO <sub>2</sub> eq/ha)	Expected losses from leakage (t CO <sub>2</sub> eq/ha)	Deduction of risk buffer (t CO <sub>2</sub> eq/ha)	Net carbon benefit (t CO <sub>2</sub> eq/ha)
Distribution of improved cook stove if 80 % families adopts ICS	55.629 t/ Assumption 1583 families 80% adopts ICP. A baseline scenario of 30 kg wood consumption per family will amount to 55.620 t of CO <sub>2</sub>	44.96 t	negligible	nil	44.96 t
Note that the underlying calculations in this table come from the technical specifications described in section 3.7					
Normally there will be a technical specification for each intervention (in the case of REDD+ a group of activities implemented together is treated as single intervention)					

### Livelihoods benefits

Complete Table 2 to describe how the project will affect different livelihoods aspects of the participating groups:

Table 2 – Livelihoods benefits							
Food and agricultural production	Financial assets and incomes	Environmental services (water, soil, etc.)	Energy	Timber & non-timber forest products (incl. forest food)	Land & tenure security	Use-rights to natural resources	Social and cultural assets
Turmaric drying	-	-	Energy saving	-	-	Yes	Turmeric drying unit to community for income generation
Turmaric processing Unit	-	-	Energy saving	-	-	yes	Turmeric processing unit to community for income generation
Shaded Coffee Plantations	To be examined after 3-4 years of establishment	Soil and water conservation	-	Coffee production	-	-	Income generation activity

### Ecosystem and biodiversity benefits

Table 3 – Ecosystem impacts				
Intervention type (technical specification)	Biodiversity impacts	Water/watershed impacts	Soil productivity/conservation impacts	Other impacts
Capacity building and awareness generation	People made aware about conservation of bio-diversity	People made aware about impacts of climate change on water resources and importance of watershed	People made aware about climate change and role of soil and water conservation	Overall awareness about climate change and other related issues developed
Introduction of Shaded Coffee plantations	Enhanced biodiversity	Shaded coffee plantation will lead to positive impact on soil and watershed	Soil productivity will be enhanced with introduction of shaded coffee plantation	Shifting cultivation reduced Livelihood impacts
Introduction of improved cook stoves	Less consumption of fuel wood results in less pressure in biodiversity	Less removal of vegetation: watershed protected		Health benefits to the society

Introduction of bamboo based agro-forestry demonstration	Enhanced biodiversity	Watershed services enhanced	Enhanced soil properties	Higher economic benefits to the communities
Developing allometric equations for biomass estimation of Bamboo species	Knowledge generated	Information on Bamboo with higher biomass will be useful in watershed planning	Enhanced soil properties	Knowledge generated will be useful in correct estimation of Biomass carbon stored/ captured by the important bamboo species.

### 3.7 Technical Specifications

**Project intervention and activities:** Applicability conditions will be worked when developing the project as per the requirements of specific standard.

**Additionality and Environmental Integrity:** The periodic reports of the ‘India State of Forest Report’ reflects that the Mizoram is one of the states in North East India where forest cover is decreasing despite government policy and programmes promoting forest conservation, afforestation, reforestation and discourage shifting cultivation. The proposed REDD+ project is additional as it addresses the drivers of deforestation and forest degradation in the project area by creating and strengthening the community based forest management system as well as delivering strategies, feasible techniques and financial support to ensure long-term sustainability of the activities. However, this is the first of its kind activity in the state of Mizoram, hence is not possible without the project activities which requisites community participation. The interventions under the ‘REDD+ Himalaya Project’ under which ‘Mamit Community REDD+ Project’ is being developed, has resulted in large scale capacity building programme on REDD+, promoted livelihood opportunities and saved the fuel wood consumption for energy and heating purpose. It is first of its kind activity in the state of Mizoram and hence it qualifies as ‘Additionally’.

The project activities have attempted to overcome following barriers:

- Lack of awareness has led the communities for unsustainable resource utilization as it has been traditionally bind to their primitive system. The project helped in creating awareness among the indigenous people on role of forest conservation in climate change and REDD+. Improved agriculture practices, modern equipments that can help reducing GHG emissions and new methods of agriculture have been introduced.
- Lack of income opportunities which has caused poverty and unemployment is the major problem due to which shifting cultivation cannot be restricted, hence creating income generation opportunities have been introduced.
- Influencing communities to adopt suitable technologies have always been challenging as economic gains come first and environment comes next if seen from community’s perspective.
- Improvising natural resource management practices at community level along with keeping objectives of REDD+ at forefront is very challenging and project activities attempt to overcome those challenges.

However, these barriers can be removed by various interventions through project activities such as capacity building programmes, awareness campaigns, trainings, improved management practices, improved land use practices, income generating activities etc. which along with socially uplifting the indigenous society, will eventually address drivers of deforestation and forest degradation and reduce GHG emissions in the project area. The project activities will further create revenues which will further support the activities such that in the absence of the project, the REDD+ project objectives may be continued.

Environmental integrity of the project shall be maintained to check reversal of emissions and any double accounting of the carbon credits generated through the project activities.

**Project Period:** Project level interventions stated in January 2016 onwards and attempts will be made to submit final PDD by June 2020.

**Baseline Scenario:**

Carbon Pools: All the major pools as suggested by the IPCC have been included

- i. Carbon pools to be accounted are
- ii. Above ground Biomass
- iii. Below ground Biomass
- iv. Litter
- v. Dead Wood
- vi. Soil Organic carbon

**Baseline Methodology:** Non-destructive approach was followed for all the carbon pools. The size of the plot was taken to be 0.1 ha and rectangular plot was opted depending upon the accuracy, precision, time and cost of measurement.

For aboveground biomass all trees above 10 cm were enumerated using diameter at breast height (DBH) and height to use in volume equations which are developed by FSI, 1996 and either site specific, species specific or both. The estimated volume was converted to biomass by multiplying with basic wood density and biomass expansion factor (Kaul *et al.*, 2009; IPCC, 2003). Further conversion factor was taken to be 0.5 as carbon fraction of dry matter to convert the aboveground biomass into carbon stock on per hectare basis.

For estimation of belowground biomass, conversion factor was used with aboveground biomass using IPCC Good Practice Guidelines (IPCC, 2003). For estimation of dead wood biomass, a quadrat of 5x5 m was laid in two corners diagonally. More than 5 cm diameter dead wood was recorded under dead wood. The biomass and carbon was measured using equation used by Rawat *et al.*, 2017b. For litter biomass, two quadrats of 3x3 m were laid in two corners. In each quadrat the fresh weight of the litter was measured. Oven dry at 65°C was done and dry material was taken. Conversion factor was used for belowground biomass, deadwood biomass, litter biomass to convert biomass to carbon using IPCC good practice guidelines (IPCC, 2003).

For soil carbon stock, soil sample within the plot 1x1 m quadrat was laid in two corners at 0-30 cm soil depth. Bulk density estimation was done using core sampler. Percent core fragment estimation was estimated by morphological examination of soils. Using Batjes, 1996 equation, soil carbon stock was calculated. Soil organic carbon was estimated by using Walkley and Black method (1934).

**Baseline Emissions:** Estimate the changes in carbon stocks for each carbon pool under baseline

conditions i.e. without project. Refer to any approved approaches that you have used for this.

Total carbon stock in four forest types were estimated and they are as follows:

- |  |   |              |
|--|---|--------------|
| 1. Secondary moist bamboo brakes               | : | 104.27 tC/ha |
| 2. Pioneer euphorbiaceous scrub                | : | 85.15 tC/ha  |
| 3. Cachar tropical moist evergreen forest      | : | 192.78 tC/ha |
| 4. East Himalayan moist mixed deciduous forest | : | 216.81 tC/ha |

Field collection of data shall be done as per the agreed plan. IPCC GPG for LULUCF (2003), IPCC GPG 2006 shall be used for data analysis and use of default factors if required

**Ecosystem service benefits:** Valuation of ecosystem services will be estimated by following the available standard methodologies which will be and best suited for the project area.

**Leakage and uncertainty:** Potential source of leakages will be identified when actual estimation of project related Net Anthropogenic GHG benefits will be accounted.

### **3.8 Risk Management**

**Identification of risk areas:** Project beneficiaries are mainly forest depended communities and as such there is no potential risk while implementing the project. Drastic change in Government Policies, abrupt climatic changes and natural calamities may pose some risk to the project.

### **3.9 Project Coordination and Management**

**Project Organisational Structure:** Project will be governed by Indian Council of Forestry Research and Education, (ICFRE) P.O. New Forest, Dehradun in collaboration with its regional centre Forest Research Centre for Bamboo and Rattan, Aizawl (Mizoram) and Mizoram Department of Environment, Forest and Climate Change.

ICFRE shall have overall project administrative responsibility. Registration and recording of sale agreements; managing the use of project finance, coordinating and recording monitoring, negotiating sales of carbon credits/certificates and reporting shall be done by the ICFRE.

Normally ICFRE shall not be seeking technical support and training in planning and implementing project activities as it is capable of accomplishing these tasks with its available human resource. ICFRE with its available human resource is capable of developing, reviewing and updating forestry and agroforestry systems. ICFRE may seek external technical support/project development services if exigency arises. ICFRE shall also act as project coordinator.

**Relationships to national organisations:** ICFRE as an autonomous body works under the Ministry of Environment, Forest and Climate Change, Government of India. As a premier forestry research organisation of the country it works for forestry related problems of the state governments as well. The project will have representatives of the State Government of Mizoram (Environment, Forest and Climate Change Department).

**Legal compliance:** ICFRE as an autonomous body under the Ministry of Environment, Forest and Climate Change, Government of India is fully committed to abide by the policies,

legislations of the government of India and the provincial governments at local level. At the time of registering the project written approval of the state government of Mizoram will be submitted.

ICFRE is an equal opportunity employer. It doesn't make any differentiation based on cast creed and religion. It follows Government of India rules and regulations.

### **Project management:**

#### **Project time line**

Concept initiated January: 2016

Interventions planned and initiated: 2017

Base line Carbon study: 2018

PDD Submission: 2020

Up scaling and Monitoring: 2020 and 2022 (every two years)

First verification: 2023

Project related data will be recorded regularly by the trained technical man power at regular intervals. The local community youth will also be engaged in data collection after their hands on training on kind of data to be collected. Data will be emailed or faxed to the office of the Project coordinator for further analysis. Project Coordinator will maintain data on soft as well as hard copies as per the standard data formats. Project Coordinator will be in charge of business development, sales and managing transactions registry.

**Project financial management and mechanisms for disbursement of PES funds:** ICFRE will seek finance from variety of source (under UNFCCC instruments/ Multilateral and bilateral) including public and private entities. A Mechanism for sharing of project related benefits shall be developed in consultation with the communities.

**Marketing:** Carbon credits/certificates will be marketed by the Project Coordinator through an approved marketing plan for the project.

**Technical support:** Project will periodically provide technical support and capacity development for project participants.

## **3.10 Benefit sharing**

**PES agreements:** Project coordinator will enter into an PES agreement with project partners. The project coordinator will ensure that obligations are met in accordance with the agreements.

## **3.11 Monitoring**

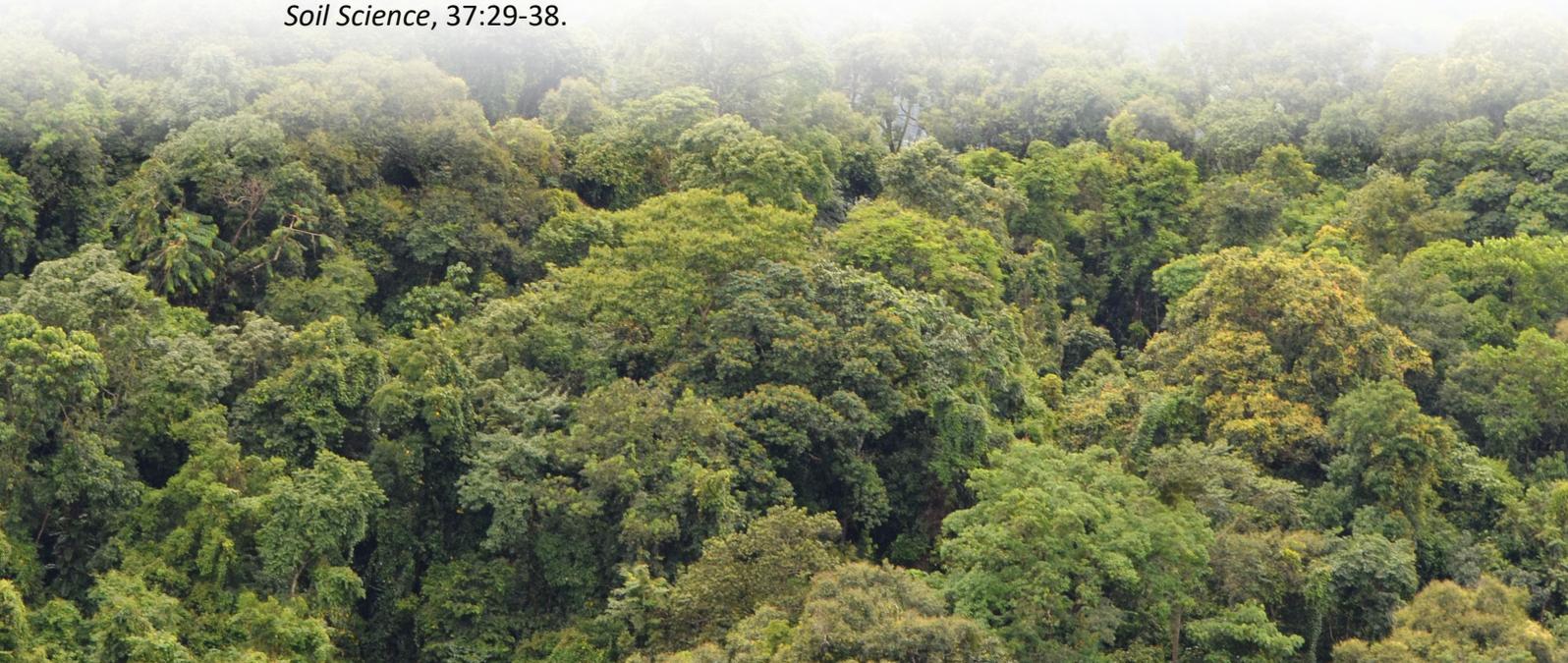
**Ecosystem services benefits:** Monitoring plan for each project intervention shall be developed and participating communities will be involved in monitoring activities.

**K2 Socio-economic impacts:** A socio-economic monitoring plan indicating the impact of interventions shall also be developed through selected socio-economic monitoring indicators.

**K3 Environmental and biodiversity impacts:** Environmental and biodiversity impacts of the project activity shall also be monitored.

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## **Annexure**

1. List of Key person(s) involved with contact information.
2. Evidence of community participation.
3. Minutes of meetings
4. Attendance sheets
5. ....



Photographs of the project planning processes with communities



## **Acknowledgement**

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Mr. Nabin Bhattarai, Consultant, ICIMOD

Field staff of FRCBR, Aizawl

All community members of the project area.

### **Layout & Design**

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