MICRO PLAN

Of

Zemabawk

Green India Mission

Prepared by

Forest Development Agency

Aizawl, Mizoram.

Executive Summary

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Chapter 1
Introduction, Scope and Objectives

1.1 About the State (Landscape - L1)

1.1.1 Introduction

Mizoram was earlier a part of the British India since 1895. In 1898, the district called "Lushai Hills" was created with Aizawl as its headquarter. After independence in 1947, the district was renamed as "Mizo District" and also the autonomous Mizo District Council was established on 25th April, 1952. Subsequently, Mizoram was made a Union Territory in 1972 and finally, it became the 23rd State of India on 20th February, 1987.

1.1.2 Location, Extent and Topography

Mizoram, which is one of the Seven Sister States in the North-Eastern India, is located between 21° 56' and 24° 35'N Latitude and 92° 16' and 93° 26'E Longitude. It shares the boundary with Assam and Manipur on the North, Myanmar on the East and the South, and Tripura and Bangladesh on the West. The long international boundary (about 630 miles) of Mizoram with Myanmar and Bangladesh makes it strategically located.

The geographical area of the State is 21,087 sq. km. with mostly hilly terrains. Most of the hills have moderate to steep slopes and are separated by rivers flowing either to the North or South direction. These rivers have created deep gorges between several hill ranges. In fact, Mizoram is "a land of rolling hills, valleys, rivers, and lakes" (Environment & Forest Department, 2010, p.5). The plains occupy comparatively a very small portion of the total geographical area and are mostly located at places such as Champhai, North Vanlaiphai etc. on the eastern part of the State.

1.1.3 Climate

The whole of Mizoram enjoys a pleasant climate with cool summer and moderate winter. The temperature varies from 11°C to 21°C during winter and 18°C to 29°C in summer. The State gets rainfall from both the North-East and the South-West Monsoon. It receives heavy rains from May to September. The average annual rainfall is about 254 cm. As such, the climate in Mizoram is conducive to conservation and sustainable development of forests.

1.1.4 Soil

The soil in Mizoram, in general, is fertile and rich in organic contents. However, the soil depth is found less at few places, particularly at very steep slopes, due to the effect of heavy run-off in degraded forests. The contents of potash and phosphorus in the soil are low, whereas the content of nitrogen is normally high because of the accumulation of organic matters over the years. The fertile soil is generally found at low to moderate slopes, on river banks and in the valleys. The soil at such places is responsive to the vigorous and healthy growth of the forests and thus supports rich biodiversity.

1.1.5 Demography

The population of the State was 10,91,014 as per 2011 census, of which 5,52,339 (51 percent) are male and 5,38,765 (49 percent) are female. The population density has increased from 33 to 52 persons per sq. km. during the decade, 1999 - 2011. Most of the people in the State belong to several culturally-linked ethnic tribes which are collectively called "Mizos" (Mi: People, Zo: Hill). These people are highly educated. Mizoram has a literacy rate of 91.58 %, which ranks it second among States in India. "Mizo" and "English" are the main languages spoken by the majority of the people.

1.1.6 Socio-economic life of the people

Since signing the "Peace Accord" on 30th June 2006, the State has effectively implemented several developmental schemes. Peace and development have resulted into comparatively better Human Development Index (HDI). The HDI in Mizoram was found 0.67, the highest among the north-eastern States and more than the national average (Government of Tripura, 2007, p.28).

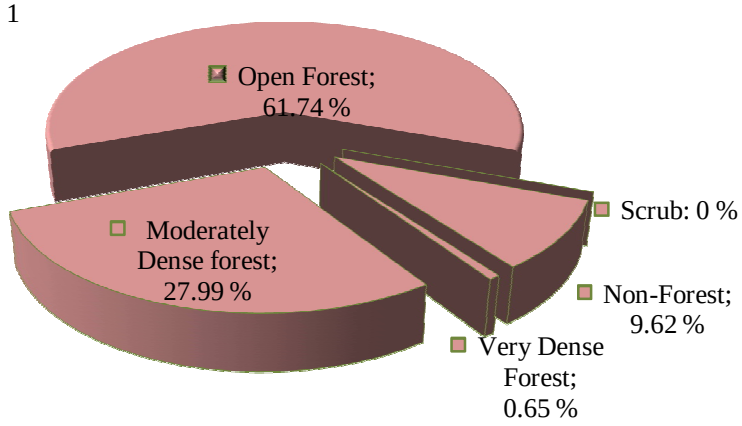
Agriculture is the dominant source of income and employment for the people in Mizoram. As per 2001 census, 61 percent of the working population in the State was dependent on agriculture. In rural areas, most of the people are engaged in "Jhumming" (shifting cultivation). 89,454 households, 57.85 percent of total 1,54,643 households, were cultivators and further, 78,195 households, 87 percent of all cultivator households, were practicing shifting cultivation (Government of Mizoram, 2004, p.17). The "Jhumming" practice has adversely affected the rich forest cover of the State. Planned efforts are now being made to control and transform the practice of shifting cultivation into settled agriculture. Technical and financial assistance is being given to the rural people enabling them to leave the practice of shifting cultivation and get engaged in other sustainable livelihood activities such as horticulture, piggery, settled cultivation etc.

1.2 The forests in Mizoram

1.2.1 Forest cover

A large area - 19,277 sq. kms. (91.44 percent of the State's total geographical area) - is covered under forests i.e. Forest and Tree cover (Forest Survey of India, 2013). However, the forests have suffered serious depletion and degradation due to the traditional practice of shifting cultivation, uncontrolled fire, unregulated felling etc. As per the "India State of Forest Report 2013" published by the Forest Survey of India, the State has 13,016 sq. kms. open forests which is 67.70 % of the total forest cover and 61.74 % of the total geographical area. The density-class of forests found in the State has been shown below graphically in Figure 1.

Figure - 1



Source: Forest Survey of India, 2013

1.2.2 Forest types

The forests in Mizoram are very rich in biodiversity. As many as 6 important forest types have been reported to occur in the state (Forest Survey of India, 2011). These are:-

- **Cachar Tropical Semi-Evergreen Forest (2B/C2):** Mostly found in all districts of the State. The important species are *Dipterocarpus turbinatus, D. tuberculatus, Terminalia chebula, Emblica spp, Careya arborea etc.*
- **Secondary Moist Bamboo Brakes (2/2S1):** Dominant species of bamboo like *Melocanna bambusoides, Dendrocalamus hamiltonii etc.* are present.
- **Pioneer Euphorbiaceous Scrub (2B/2S1):** It is generally found in degraded forests and exposed lands present on higher slopes and on top of the hills. It has quick growing species like *Macaranga* spp., *Mallotus* spp. etc. This type is found in all districts except Kolasib.
- **East Himalayan Moist Mixed Deciduous Forest (3C/C3b) :***Schima wallichii, Syzigium cuminii, Albizziaprocera, Dilleniapentagyna, Artocarpus lakoocha, Terminalia ballerica, T. chebula, Lagerstroemia parviflora, Anthocephalous kadamba*etc. are the characteristic species of this type. It is found in all districts of Mizoram.
- **East Himalayan Subtropical Wet Hill Forest (8B/C1):** Major characteristic species are *Quercusvercus, Q. serrata, Castanopsis spp, Litsea spp. Machilus spp* etc. This forest type is found in Kolasib district.
- **Assam Subtropical Pine Forest (9/C2):** It is mostly dominated by the species *Pinuskesiya* with other associates like *Quercus* spp, *Schima wallichii, Rhododendron* spp etc. This forest type is found mainly in Champhai district of the State.

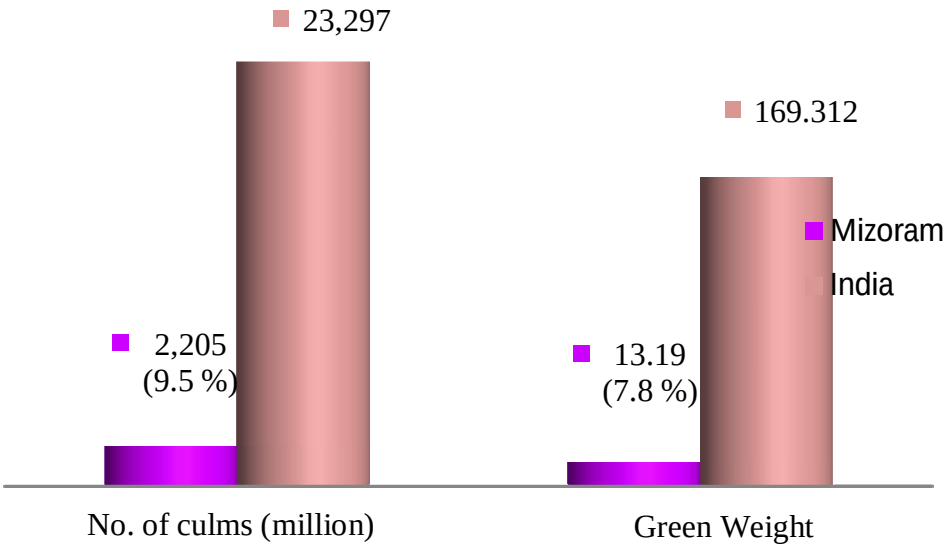
1.2.3 Bamboo Resources

Nature has endowed Mizoram with valuable Bamboo Forests. Bamboos - Green Gold for the State - are one of the most important natural resources which provide immense economic and environmental benefits for the local people. Bamboos are used for

multiple purposes as the culms are straight and strong but light. These are used extensively in house construction particularly in the rural areas, as food, and for making various household items such as stools, benches, kitchen utensils, agricultural implements, and fishing devices. Further, bamboo acts as an effective soil binder protecting the slopes from erosion through its deep and extensive root system.

Bamboos are found abundantly in the State mainly along river banks and on abandoned jhumland. Both the clump forming and the non-clump forming species occur naturally in most parts of the State except on the higher altitudes of its eastern region. A large area of about 9,245 sq. kms., which is 44 percent of the State's geographical area, is covered under "Bamboo Forests" (Forest Survey of India, 2011, p.61). In spite of being small in size, Mizoram contributes significantly to the country's growing stock of bamboos.

Bamboo resources of the country have been assessed by the Forest Survey of India (FSI), Dehradun. As per the India State of Forest Report 2011 (Chapter 6) published by the FSI, total number of culms in recorded forests of Mizoram has been estimated to be 2,205 million as against 23,297 million estimated at the national level. Similarly, the total estimated green weight of bamboo culms has been estimated to be 13,187,000 tonnes for the recorded forests of Mizoram as against 1, 69,312,000 tonnes for the whole country. The growing stock of bamboos in recorded forests of Mizoram as against the same for the whole country has been shown below graphically.



Area under "pure bamboo brakes" in Mizoram was found the highest among all the States/Union Territories of the country (226 sq.kms.). The dense bamboo forests also cover a large area in the State of Mizoram. The dense bamboo across all the States was found maximum in Arunachal Pradesh (8,681 sq. kms.) followed by Mizoram (6,116 sq.kms.).

The bamboo forests in Mizoram are also rich in bio-diversity. 35 species of bamboos under 9 genera have been reported to grow in the State (E & F Department,

2010). *Melocanna baccifera*(locally called “Mautak”), a non-clump forming species, is the prominent species found in the State. Other dominant species are *Dendrocalamus hamiltonii* (Phulrua), *D. longispathus* (Rawnal), *Bambusa tulda* (Rawthing), *B. longispiculata* (Rawthing chi), and *Arundinariacallosa* (Phar). These species do not occur in large proportions like Mautak but are commercially valuable.

1.2.4 Areas under Notified Forests in the State

The notified forests include (1) Riverine Reserve Forests (1832.50 sq.kms), (2) Innerline Reserved Forests (570 sq. kms.), (3) Roadside Reserve Forests (97.20 sq.kms.), (4) Other Reserve Forests (1963.63 sq. kms.) and (5) Protected Areas (1240.75 sq.kms) under the ownership of the State Government as well as 2562 sq. kms. under the ownership of District Councils. Thus, about 39 percent of the total geographical area (8266.08 sq.kms.) is covered under “notified forests” in the State of Mizoram.

1.2.5 Protected Areas

The Environment and Forest Department, Govt. of Mizoram has taken praiseworthy initiatives for preservation of wildlife by constituting one Tiger Reserve, two National Parks and seven Wildlife Sanctuaries. These are (1) Dampa Tiger Reserve, (2) Murlen National Park, (3) Phawngpui National Park, (4) Ngengpui Wildlife Sanctuary, (5) Lengteng Wildlife Sanctuary, (6) Khawnglung Wildlife Sanctuary, (7) Tawi Wildlife Sanctuary, (8) Thorangtlang Wildlife Sanctuary, (9) Pualreng Wildlife Sanctuary, and (10) Tokalo Wildlife Sanctuary. The area set aside for long-term wildlife conservation is 1728.75 sq. km. which is more than 8 % of the State’s geographical area.

The network of protected areas provides healthy habitats for many wild animals, birds, and reptiles. Some important species of mammals found in the State are Tiger, Elephant, Malayan Sun Bear, Wild dog, Brush Tailed Porcupine, Gour, Leopard Cat, Marbled Cat, Golden Cat, Clouded Leopard, Serow etc. The forests of Mizoram also provide habitats for primates such as Assamese Macague, phyare Leaf Monkey, Slow Loris, Pig Tailed Macaque, Stump Tailed Macaque, Rhasus Macaque, and Capped Langur and also for Hoolock Gibbon, the only ape found in India.

Important bird species found in the State are Black Stork, Oriental Darter, Serpent Eagle, Black Eagle, Humes Bartailed Pheasant, Blyth’s Tragopan, Green Burmese Peafawl, Grey Peacock, Rufous Patridge, Brushed Patridge, Yellow-legged Button quill etc. The Hornbill species include Great Indian Hornbill, Wreathed Hornbill, Oriental Pied Hornbill, Brown Hornbill, and Rufous-necked Hornbill.

1.3 Bio-geographical importance

The forests in Mizoram are ecologically significant as the region represents an important part of the Indo Myanmar bio-diversity hotspot which is one of the 25 global biodiversity hotspots recognized across the globe. Several hot-spots in the State carrying diverse flora and fauna have been identified for protection. Further, the region is part of biologically distinctive eco-system (Mizoram-Manipur-Kachin Rainforests

Eco-region). As such, conservation of the forests in the State is a necessity for arresting the progress of climate change and mitigating the impact of changing climate on the people.

1.4 Expectations of people from the forests

1.4.1 People's Participation in Conservation of the Forests

The State of Mizoram moved from State regulation to people's participation for managing its rich forest wealth by adopting the "Joint Forest Management" (JFM) through a notification issued in 1998. The introduction of JFM established a new mutually-beneficial relationship between the forests, the people and the State. The basic objective for adopting the mechanism of JFM in the State was to encourage active involvement of the local people in enrichment, protection and sustainable management of the forests.

It was envisaged to impart sense of ownership over the forest areas covered under JFM to the villagers. Guidelines for managing the forests with people's participation were framed. As per these guidelines, the local people participating in managing the forests and the State would share the forest produce, which may be extracted from the areas covered under JFM by applying scientific principles of sustainable management.

The organizational structure for managing the forests with constructive participation of the local people, at present, consisted of three levels in the State i.e. (1) State Forest Development Agency (SFDA) at the State level, (2) Forest Development Agencies (FDAs) at the divisional level, and (3) Village Forest Development Committees (VFDCs) at the village level. Eco-Development Committees (EDCs) have been constituted for the villages located near the protected areas. The existing guidelines for JFM included (1) the procedures for constituting SFDA, FDAs and VFDCs/EDCs, (2) their duties and responsibilities, (3) methodology of preparing micro-plans, their effective implementation, and timely monitoring, (4) fund flow mechanism, and (5) disposal of forest produce and sharing of benefits.

For involving the local people in planning, implementation, and monitoring of schemes for forest management, one SFDA, 21 FDAs and 598 VFDCs/EDCs have been constituted in Mizoram. These committees i.e. VFDCs/EDCs have 2, 75,435 members belonging to 80,728 families. Memorandum of Understandings (MoUs) has been signed between SFDA and FDAs and also between various FDAs and VFDCs/EDCs.

Works under centrally sponsored scheme - "National Afforestation Programme" (NAP) - are mainly taken up by VFDCs/EDCs through FDAs. Revised operational guidelines for implementing NAP through JFM were issued in the year 2009 by the Ministry of Environment and Forests, Government of India. These guidelines were aimed at (1) strengthening institutional arrangements for project implementation (capacity building), (2) treatment of highly degraded lands (problem lands), (3) application of latest nursery and plantation techniques, (4) generation of additional sustainable income for members of VFDCs/EDCs through value addition to forest

produce and linkage to better markets for forest-based products. The Government of Mizoram has adopted these revised guidelines by issuing notification in March, 2010.

The scheme - NAP - is being implemented effectively in Mizoram through the mechanism of JFM. Suitable tree species have been planted over an area of 57540 ha. under NAP during the period2003-04 to2013-14. These plantations are being protected through joint efforts of the local people and the Government agencies. It is expected that enrichment, protection, and sustainable management of the forests through JFM will provide substantial benefits to the local people while contributing significantly to ecological equilibrium and environmental stability.

1.4.2 Stakeholder's expectations

The local people particularly those living nearby forest areas expect sustainable livelihood support from the forests through extraction of permissible yield, value addition to forest produce and marketing of value-added products. They also expect to meet their needs for constructional timber at economical cost from the forests. However, they are also concerned for ecological stability in the region. Expectations of various stakeholders from the Environment and Forests department are given as under:-

Table 1

Slno.	Name of Stakeholder	Expectations from the Department
1	The Indian citizens living in Mizoram including the indigenous people.	a. Ecological balance and environmental stability. b. Bonafide forest-based needs - constructional timber, fuel wood, and fodder – as per the Mizoram Forest Act,1955. c. Constructive participation in afforestation, enrichment, and protection of forests. d. Easy access to information on uses and economic benefits of the forest products including Non-Timber Forest Products (NTFPs) and Medicinal Plants. e. Availability of technical know-how as well as other facilities for raising private plantations.
2	The State Government	a. Effective implementation of the planned schemes achieving the desired outcomes. b. Satisfaction of the local people.
3	The Government of India	a. Conservation of environment and forestry resources as envisaged in the National Forest Policy, 1988. b. Balance between conservation and development by implementing the provisions of the Forest (conservation) Act, 1980 as well as other National and State acts and rules related to management of the forests and the wildlife.

4	The forest officials working in the State	a. Healthy working conditions. b. Adequate facilities at par with our counterparts in other departments/services. c. Awards and recognition for good works.
5	Non-Government Organizations (NGOs)	a. Increase in forest cover. b. Enrichment and protection of the existing forests. c. Preservation of wildlife by creating and maintaining healthy habitats for them. d. Generating awareness towards the importance of forests and wildlife. e. Eliciting active participation of public in conservation and protection efforts.
6.	Private tree/bamboo growers	a. Technical knowhow. b. Logistic and financial support for raising and managing the plantations. c. Mechanism to facilitate harvesting and transportation of timber and bamboos.

Accordingly, the Department of Environment & Forests, Government of Mizoram is committed to provide a variety of services, both tangible as well as intangible, to the citizens by scientifically managing the rich forest cover existing in the State. The tangible services include (1) arranging forest products of economic importance such as constructional timber, fodder, fuel-wood, sand, gravels etc. at reasonable costs, (2) offering gainful employment while implementing various schemes for enrichment and protection of the forests, (3) creating opportunities for additional income through the mechanism of "Joint Forest Management", (4) disseminating information on importance and economic benefits of the forests including Non-Timber Forest Products and medicinal plants, (5) building and maintaining eco-friendly recreation sites and trails, (6) making technical know-how available for raising and managing private forests/plantations, and (7) assisting private tree-growers in silvicultural harvesting and transporting of timber inside as well as outside the State. The intangible services include (1) stabilizing the climate, (2) enriching the soil fertility, (3) recharging ground water, (4) regulating the water flow, and (5) offsetting the air pollution.

1.5 Objectives for GIM implementation

Although the identified landscape (L-1) - the entire state of Mizoram - has a large area under forest cover, the forests are not rich in quality. About 67.70 % of the forest cover is open, having very less canopy density. A large extent of open forest, particularly in the hilly terrain, can have devastating impacts on the normal structure and the delicate interdependencies of diverse flora and fauna in the forest ecosystem. The situation is likely to be further aggravated in Mizoram by the prevalence of shifting cultivation and other biotic interferences.

Efforts to enrich and protect the forests are being taken up by effectively implementing various schemes such as National Afforestation Programme, Integrated Forest Management, Thirteen Finance Commission Grants-in-Aid, National Bamboo Mission, New Land Use Policy etc. The local people are being encouraged to shift from shifting cultivation to settled agriculture by providing them technical and financial assistance.

The treatments being done to the landscape coupled with the proposed interventions under Green India Mission (GIM) will save the valuable hilly ecosystem of the State from deterioration. It is expected that implementation of proposed strategies will enhance the quality of existing forests, ecologically re-stock wastelands, improve eco-system services, increase forest-based livelihood income and augment annual CO_2 Sequestration.

1.6 Scope of implementing planned interventions under GIM

The GIM, which aims at providing sustainable livelihood support to the people in a stable eco-system, would be implemented initially in 51 villages of eight identified L2 landscapes. These villages form compact blocks for treatment in five Forest divisions/4 districts of the State. It is further planned to extend the mission in other parts of the State. It is to mention here that, the entire State has been identified as vulnerable i.e L1 landscape

Chapter 2
Details of Identified Landscapes

2.1 Criteria for selection of L1 Landscape

Criteria, which were adopted for identification of L1 landscape, are given below:-

Table 2

Details of Criteria

Item	Criteria	Details	Details of the source of data, maps etc. appended
1. Forest cover and degradation	a) Forest cover	19,277 sq. kms. (91.44% of the State's geographical area).	India State of Forest Report 2013, Forest Survey of India, Dehradun.
	b) Bio-diversity	The State is rich in Bio-diversity, having six major forest types, namely i) Cachar Tropical Semi-Evergreen Forest, ii) Secondary Moist Bamboo Brakes, iii) Pioneer Euphorbiaceous Scrub, iv) East Himalayan Moist Mixed Deciduous Forest, v) East Himalayan Subtropical Wet Hill Forest, vi) Assam Subtropical Pine Forest.	India Forest Atlas prepared by Forest Survey of India, Dehradun
	c) Wastelands	6021.14 sq km (28.56% of the State's total geographical area) is wasteland including jhumland.	Wastelands Atlas of India, 2010.
2. Projected Forest vulnerability to climate change	a) Vulnerability maps and attribute data	Although the State is having a large area under forest cover, the forests are not good in quality. The State has 13,016 sq km open forest which is 67.70% of the total forest cover and 61.74% of the total geographical area. It is expected that a large extent of open forests, particularly in the hilly terrain, may	As indicated above in column 1.

		adversely affect not only the forest eco-system but adjoining areas as well. The situation is likely to be further aggravated in Mizoram by the prevalence of shifting cultivation and other biotic interferences.	
		Effect of climate change in the State is – 1) irregular behavior of rainfall, 2) rise in mean maximum and mean minimum temperatures, 3) gradual and progressive increase in humidity, and 4) increased frequency of extreme climate events (heavy rainfall, flash floods, etc.). Forests are highly vulnerable to these changes in climatic conditions. Impact of climate change on the forests coupled with biotic interferences is characterized by – 1) degradation (a large extent of open forests), 2) loss of biodiversity, 3) increased incidence of invasive species, and 4) loss of forest environmental functions (water conservation, soil conservation, flood control etc.).	1) Programme Design Document for North East Climate Change Adaptation Programme presented to KfW Germany, DoNER, and State Govt. 2) Field observations by Forest Officers.
3. Vulnerable Population / Communities	a) ST/SC Total population, ratio b) Scheduled areas	The majority of the population in the State - over 95% - belongs to STs.	2011 Census data, Govt. of India.

2.2 Importance of L1 Landscape

Based upon the criteria given in para 2.2, the entire State of Mizoram (Area: 21,081 sq. km.) has been taken as L1 Landscape. Proper treatment of the landscape in the State would bring ecological security in the region and would also contribute significantly to stabilize the changing climate. The bio-geographical importance of the L1 landscape has been given in para 1.3.

2.3 Criteria for selecting L2 Landscape

Operational units (L2 level) have been identified based mainly on five indicators which are (1) extent of open forest, (2) dependency of the local population on the forests i.e. biotic pressure, (3) drainage pattern, (4) prevalence of shifting cultivation and (5) compact block for treatment under GIM. The criteria for selection of L2 Landscapes are given below in detail:

Table 3

	Criteria	Details	Details of the Source of data – Maps etc appended
Extent of open forests	Extent of degraded forests i.e. forests having very less canopy density	Aizawl, Champhai, Lawngtlai, Lunglei, and Mamit districts have larger area under open forests.	FSI, Dehradun
Forest Dependence	Forest areas (sq. kms.) per 1000 population	Aizawl, Champhai, Kolasib, and Serchhip districts have less forest areas per 1000 population. Therefore, it is expected that these districts may witness more biotic pressure on the forests.	Data for forest areas: FSI data and for population: census data.
Drainage Pattern	Catchment areas of major and important rivers	After identifying the divisions on the basis of first two criteria, the operational units have been identified within these divisions on the basis of these two criteria.	Maps obtained from GIS Cell, E&F Deptt., Mizoram
Prevalence of shifting cultivation	Areas including Abandoned Jhumland and Current Jhumland		Maps obtained from GIS Cell, E&F Deptt., Mizoram
Formation of Compact Block	All identified L2 landscapes to form a compact block for better outcomes.	Aizawl, Champhai, Darlawn, Kolasib and Thenzawl divisions form a compact block in the State.	Map of the State.

2.4 Reasons for selecting this L2 landscape among other possible L2 landscapes within L1:

A meeting (brainstorming session) of senior forest officers was held in March, 2012 to discuss various issues and formulate suitable strategies for the preparation of Bridge Plan/Perspective Plan under GIM. The views presented by the senior officers in the meeting are summarized below:

- The operational units should be from the districts which satisfy either of the two criteria i.e. extent of open forests or biotic pressure on the forests. Further, this unit should be strategically important for i) treatment and management of catchment areas and ii) engagement of the local people in settled agriculture or other sustainable livelihood options i.e weaning them away from jhum cultivation.
- The operational units, so selected, should form a compact block.
- The forest divisions, where activities similar to those proposed under GIM (KfW sponsored North East Climate Change Adaptation Programme) are being carried out, may not be taken up as operational units.
- Aizawl city, which carries maximum concentration of population (26% of the State's population), has the significant impact on the climate and the eco-system in the State. Therefore, forest-based interventions inside and outside the city of Aizawl may be taken up under GIM.

Considering the above views, it was decided in the meeting that 8 nos. of operational units in 5 forest divisions namely Darlawn, Champhai, Thenzawl, Kolasib, and Aizawl (for Aizawl division limited to inside and outside Aizawl city) may be taken in the initial five years of GIM. Other areas/divisions may be taken up subsequently under GIM.

The proposed landscape, 'Aizawl' city is the State Capital of Mizoram which is under Aizawl Forest Range (Sadar) in Aizawl Forest Division. This Landscape holds important criteria among the people of Mizoram. Being a State Capital, the environment now consists of pollutions such as air pollution, water pollution, soil pollution etc. eventually caused by smoke from vehicles, sewages etc. of the people who dwells in. For this purpose, healthy environment such as fresh and healthy air, water, soil etc are profoundly needed for both human and wild animals. Therefore, it is greatly believed that the Green India Mission would ensure provide such a healthy environment for Aizawl City. The landscape consists of open and degraded forests, both Government and privately owned. There are many current and abandoned jhumlands as well. Further, it forms the catchment area of TlawngRiver which is the main source of water supply for the whole City. The treatments under Green India Mission would ensure continuous and uninterrupted supply of water for Aizawl City. As such, Aizawl City was selected as L2 landscape for treatment under GIM.

2.5 Importance of L2 Landscape (Aizawl City)

The identified landscape Aizawl City is the Capital of Mizoram. Treatment of this landscape under GIM would ensure regular water supply to the inhabitants living in Aizawl City. Well-stocked good-quality forests in "Aizawl" landscape will also stabilize

water flow in another major river of the region i.e. Tlawng river flowing in north-west direction and Tuirial river north direction.

All villages namely Sihphir, Sihphir Venghlun, Durtlang N, Durtlang, Muthi, Zemabawk, Chaltlang, Tanhril, Maubawk, Tlangnuam, Melthum and Hlimen having interests in "Aizawl City" have been taken as "Working Units" under L2 landscape.. The total geographical area of this L2 landscape is 207.58 sq. kms. In the past, most of the land was covered with well-stocked good-quality forests. However, the forests have suffered serious depletion and degradation due to traditional practice of shifting cultivation and uncontrolled felling of tress. As a result, presently, most of the areas are either wastelands or forests having very less canopy density i.e. less than 10%. It is expected that execution of well-planned strategies under GIM may result into ecological stability in the region.

Further, this L2 landscape controls water flow in several streams/rivers such as Tuithumlui, Beraw Lui, Serlui etc, and for the northern part of the city the Tuirial catchment area are Chite, Muthilui, Tuipawl, Kawrbel etc. . These water-bodies are natural sources of water for the whole Aizawl city area. The productivity of agricultural crops also depends upon water flow in these streams/rivers.

2.6 Criteria for selection of L3 landscape (Zemabawk)

All villages namely Tuirial, Muthi, Thuampui and Zuangtui have been taken as "Working Units" i.e. L3 landscape.

2.7 Importance of L3 landscape (Zemabawk)

All Local Council of Zemabawk is one of the four L3 landscapes (working units) identified for coverage in L2 landscape "Zemabawk". The Zemabawk village was established around the year 1896. It has the population of 11,211 with 1869 households (761 households under BPL category). The villagers are quite educated, literacy rate being 98.5%.

The total geographical area of this L3 landscape is 9.65sq km. In the past, most of the land was covered with well-stocked-good-quality forests. However, the forests have suffered serious depletion and degradation due to traditional practice of shifting cultivation and uncontrolled felling of trees. As a result, presently, most of the areas are either wastelands or forests having very less canopy density i.e. less than 10%. It s expected that execution of well-planned strategies under GIM may result into ecological stability in the region.

2.8 Extent of L1 landscape

Name of the L1 landscape: The entire State of Mizoram (Map enclosed as Annexure 'A')

Location of the landscape:	State	: Mizoram
	District	: All Districts
	Forest Division	: All Forest Divisions

Extent (area, boundaries, geo-references):

- Geographical area of the State is 21,087 sq. kms.
- The State shares boundary with Assam and Manipur on the North, Myanmar on the East and the South, Tripura and Bangladesh on the west.
- It is closed between 21°56' and 24°31' N latitude & 92°16 and 93°26'E longitude.

2.9 Extent of L2 landscape

Name of L2 landscape: Aizawl City (Map enclosed as *Annexure 'B'*)

Location of the L2 Landscape: State : Mizoram
District : Aizawl
Division : Aizawl

Geo references of the L2 Landscape: It is located between 92°49'35.709" E, 23°52'14.248"N Longitude, 92°39'14.498"E, 23°44'38.737"N Latitude, 92°48'35.829"E Longitude, 92°48'35.829"E, 23°46'4.663"N Latitude

Area details of the landscape: (maps at Annexure C)

Area details of the landscape	:	(maps at Annexure C)
Open forests	:	77.05 sq. kms.
Moderately dense	:	40.01 sq. kms.
Dense forests	:	
Scrub lands	:	
WRC	:	1.72 sqkms
Horticulture	:	10.805 sq km
Other areas	:	10.604 sqkms
Current jhumland	:	2.13 sqkms
Abandoned Jhum	:	0.36sqkms
Area under Settlement	:	21.71 sqkms
Total area	**:**	**164.389 sq kms**

2.10 Extent and other features of L3 landscape (Zemabawk)

Table 4

Location	Located inside Aizawl City on the way to Champhai NH
GPS Coordinates:	1. 92°45'5.372"E,23°45'24.705"N 2. 92°45'49.463"E, 23°42'0.719"N 3. 92°44'35.451"E,23°41'3.683"N 4. 92°44'6.038"E, 23°44'4.463"N
Area	9.65 sq. kms.
Forest cover	Moderately dense forest – 0.24 sqkms., open forests – 5.59 sq. kms., non-forests – 3.82 sq. kms..
Forest type	Cachar Tropical Semi Evergreen Forest (2B/C2) mixed with bamboo breaks. Important species found in the locality are *Dipterocarpusturbinatus, D tuberculatus, Terminaliachebula, Emblicaspps, Careyaarorea* etc. Dominant bamboo species are *Melocannabaccifera,*

	Dendrocalamushamiltonii, Bambusatulda, D longispathus etc.
Soil quality	Three soil orders i.e. ultisols, inceptisols and entisols are found in the project area. The surface soil textures are loam to clay loam with clay content increasing with depth in the hills whereas in the valleys it is mostly sandy loam to sandy clay loams. The soils are acidic in nature with pH values ranging from 4.5 to 6.3. The soils in the hills are strongly acidic in reaction, whereas, the soils in alluvial deposits are less acidic in nature. The percentage of organic carbon content is medium (0.70%).
Topography	Some portion of the land is undulating with moderate slope i.e 15° to 30°, whereas most parts of the land are comparatively flat with an altitude of 800-900 mts. above MSL.

2.11 Profile of L3 Landscape (Zemabawk)

2.11.1 Population

The population data of Zemabawk village is given below in the following table:

Table 5A

No. of Households	Population		Children below 6years	Total
	Adult Male	Adult Female		
1869	4095	4075	3041	11,211

The average family size is 4 to 5 persons per household.

The Population details of Workers are as under:-

Table 5B

Total workers	Regular/Main Workers	Irregular/Marginal Workers	Non Workers
Workers : 5130 Male: 3030 Female: 2100	Regular Workers:3000 Male: 2100 Female : 900	Irregular Workers:1900 Male: 1250 Female: 650	Non Workers: 230 Male : 130 Female: 100

Source Census data 2011

2.11.2 Social structure

The social structure of the population at Zemabawk village is as under:-

Table 6

General	Schedule Caste	Schedule Tribe	OBC	Total
100	200	10900	11	11,211

Source: Census data, 2011

2.11.3 Wealth Ranking

Table 7

Sl No.	Classification	No. of families
1.	Rich (families having RCC building or motor car whose annual income exceeds Rs. 5,00,000.00 per annum	243
2	Middle class but above BPL	965
3	Poor (families who are listed as BPL by the State Government).	761

Source: Actual field verification

2.11.4 No. of Educational Institutions

Table 8

Anganwadi	Primary School	Middle School	High School	HSS	Colleges	Others
10	4	3	1	1	RIPANS	-

Source: Field Verification

2.11.5 Enrolment as on 15th Aug 2014)

Table 8

Anganwadi	Primary School	Middle School	High School	Colleges	Others
200	350	360	320	480	-

Source: Field Verification

2.11.6 Literacy percentage

Male – 95% Female – 95% Overall – 95% (Source: Census data 2011)

2.11.7 Occupation

Table 10

Sl.No	Category/Type of Occupation	No. of families
1	Govt.service	780
2	Jhumming (Shifting cultivation)	230
3	Horticulture including WRC	120
4	Business/Petty trade	650
5	Daily labourers	21
6	Others	68

Source : Field verification

2.11.8 Livestock population

Table 11

Cattle	Goat	Sheep	Pig	Poultry	Others
60	15	-	730	2800	-

Source: Field verification

2.11.9 Agricultural practices

Table 12

Category	Current Jhumming	Abandoned jhumming	WRC
Area (Ha.)			

Source: Existing Land use Map (Annexure D)

2.11.10 Cropping pattern

Table 13

Sl. No	Crop	Time of Sowing	Time of Harvest	% of agri area Covered
1	Rice	April – May	Sept – Nov	5
2	Orange	May – June	Oct – Dec	10
3	Banana	April – March	Jan – Dec	10
4	Mustard	May – June	March – April	3
5	Maize	March	June	3
6	Ginger	April – June	Oct – March	4
7	Pumkin	March	June	5
8	Calocasia	April	Nov – Dec	2
9	Local pea	March	Sept – Nov	5
10	Soya bean	June – July	Nov – Dec	3
11	Oil palm	June – July	Aug – Dec	-
12	Squash	Feb – March	Jun – Dec	20
13	Bean	March – May	May – July	30

2.11.11 Water Resource

The main sources of water for the people living in Zemabawk village i.e. water from Public Health Engineer (PHE department),.House – to – house connection has been provided. Rain water harvesting is being done by limited well-to-do families only.

2.11.12 Energy consumption Pattern

The village has already been electrified by Power & Electricity Department of the State. In addition, energy requirement is met from LPG connections, kerosene oil and fuel-wood collected from the Village Supply Reserves, the Jhumlands and surrounding forests.

2.11.13 Demand of fuel-wood

The demand for fuel-wood has been worked out based upon inputs received from NGOs, LC members and other villagers. The annual demand is as under:-

Table 14

Average annual demand/household	No. of households	Total annual demand of the village
6 cum	1869	11214 cum

The supply as per the carrying capacity of existing forests in L3 (Zemabawk) is expected as under:-

A - Total forest area:5.83 Sqkm

B - GS/ha. As per working Plan Survey Report: 76.58 cum.

C - Total GS:44646.66

D - Annual Yield:1500

E - Fuel-wood availability assuming 30% of the annual yield as fuel wood: 450Cum

2.11.14 Existing infrastructure

Anganwadi centre (10.), Primary School (4), Middle School (3), High School (1), Community Hall (1), Mini-Market (1), Mini Playground (1), Medical Set-up (1),and Govt. Offices – 1(Sub Centre). Local Institutions/ Organizations: - Local Council, YMA(1 Branch), MUP(1Unit), MHIP (1 Unit)and Games and Sports Association.

2.11.15 Problems and Priority

Through PRA exercise, problems being faced by the villagers could be ascertained. These are lack of proper medical facility, absence of link road to agricultural fields, incomplete net-work of approach roads within the village, in-sufficient supply of LPG cylinders and scarcity of good quality water supply.

2.12 Demographic statistics of L2 Landscape

Table 15

Sl. No.	Village	Population			Poverty (BPL families	Forest dependency	Drivers of degradation	JFMCs/other institutions of Gram Sabha
		Total	SC	ST				
1	Zemabawk	1200	-	1200	126	Shifting Cultivation Fuel, wood timber for construction of houses, furnitures etc.,	Dealt in para 2.15	Village Forest Development Committee (VFDC) active in all these villages.

Source: Census data 2011

2.13 Present intervention for addressing livelihood needs (forestry as well as non-forestry sector) and promoting sustainable forest development

Table 16

Sl. No	Name of Scheme	Implementing agency	Forestry and Wildlife activities	Other components Like SMC	Details of livelihood component	Villages Covered
1	NLUP (New Land Use Policy)	Different line departments such as Soil conservation, Horticulture, Agriculture, Forest, Sericulture, Fisheries, Industries, AH&Vetyetc	Plantation of bamboos and other indigenous tree species	Construction of terracing, trenching Rain water harvesting structures etc.	Provision of technical and financial assistance to the villagers for sustainable livelihood supports as to wean them away from the traditional practice of Jhumming	Zemabawk
2	NAP (National Afforestation Programme)	FDA Aizawl/ Concerned VFDC	Sustainable management of the forests with people's participation, Plantation is carried out over degraded lands	Construction of contour trenching, check-dams, inspection path etc.	Livelihood support/ income generation through direct employment, sustainable extraction of bamboo and marketing of value added products	-
3	NBM (National Bamboo Mission)	FDA Aizawl/ Concerned VFDC	Plantation of bamboos, training to farmers for increasing crop – productivity	- do -	Livelihood support is expected from extraction of bamboo and marketing of value added products	-
4	IAY (Indira Gandhi Awaas Yojona)	DRDA, Aizawl	Nil	Nil	Construction of house for the poor	-

2.14 Gaps/ strategies identified under GIM

Table 17

Sl. No	Village	Forestry activities proposed	Other activities like SMC	Livelihood activities proposed	Any others
1	Zemabawk	Enhancement of quality in existing forests(with limited root stock and open blanks), ecosystem restoration (rehabilitation of shifting cultivation), agro Forestry, Social forestry and support to community conserved areas	Interventioning catchment areas of hydrological importance	Community livelihood enhancement	Promoting alternate energy sources

2.15 Drivers of degradation and deterioration in the forest eco-system

Table 18

Sl. No	Village	Drivers of degradation
1	Zemabawk	Traditional practice of shifting cultivation, lack of strategic and participatory land-use planning, excessive population pressure on the forests for fuel-wood, fodder, timber etc., inadequate scientific management of watersheds including rain water harvesting.

Chapter 3
Process undertaken for preparation of Micro-Plan/Sub-Landscape Plan

3.1 Constitution of Micro-Plan Working Group

A meeting was held with members/representative of Local Council for Zemabawk village conservation – oriented NGOs (YMA, MHIP and MUP), Forest Officers and other prominent citizens of the village on 5.12.2014 as per recommendations made in the meeting, a Micro Plan Working Group was constituted for facilitating preparation of micro-plan for Zemabawk village (L3 landscape). The constitution of the group is as under:-

Leader:	Davida	Local Council Chairman
Members:	1. Kapsanga	Local Council Member
	2. Lalhmachhuana	Local Council Member
	3. C.Lalmalsawma	Local Council Member
	4. Lalthianghlima	Local Council Member
	5. K.Lalbiakliana	Local Council Member
	6. Lalsangpuia Pachuau	VFDC Secretary

A questionnaire was designed by the committee for collection of data on (1) demographic status, (2) socio economic conditions of the villagers, (3) resources available in the village etc. the questionnaire was designed to facilitate (1) assessment of current land use pattern and formulation of proposed land use pattern, (2) participatory resource-based land-use planning (3) identification of livelihood needs, (4) planning of activities for sustainable livelihood support to the people and ecological stability in the region. The members of the working Group also visited the area covered under L3 landscape.

3.2 Participatory Rural Appraisal (PRA)

PRA exercise including group discussion, experience sharing, one-to-one discussion with the villagers etc. was conducted to promote people's participation in project planning, implementation and monitoring. Information on various issues concerning GIM implementation was explained to the villagers through interception of maps and other documents. Resource mapping, preparation of existing land use map, seasonal calendar(cropping season and wealth ranking exercise were completed during PRA activities. The principle of participatory land use planning was adopted. With available technical inputs and in consultation with all stakeholders including the local public, proposed land used map was prepared. The proposed land used map reflects the area where interventions are required to be planned and implemented.

3.3 Households Survey

Household survey was carried out in the village covering almost all the families. A structured questionnaire was prepared for collecting information and dependency of every family on the forests as well as other required data/details.

3.4 Transcend Walk

Transcend walk was done by the micro-plan Working Group along-with local people and VFDC members. During transcend walk, inputs were obtained from the field for deciding upon the suitability of the proposed land-use. GPS readings of the prominent sites/spots visited by the Working Group were also recorded.

3.5 Details of Awareness programmes, meeting and Work-shops along with the resolutions and other outcomes

Table 18

Sl. No	Workshops/ Meetings (state/landscape /village level)	Category (stakeholders and no. of participants)	Major outcomes	Details of facilitators engaged	Whether resolutions/ Photographs enclosed
1	State/L1 level (State mission Directorate)	Representatives of all line departments, reputed academic and technical institutions	Suggestions were given for strengthening institutions responsible for GIM implementation in the State	Principal secretary, environment and Forest Govt. of Mizoram	Minutes of the meeting enclosed at *Annexure-IB*
2	District (L2 level)	Representatives of VFDCs, VCs and NGOs (YMA, MHIP and MUP). (66 participants)	More trainings are required to be given at all levels. GIM guidelines in local dialect may be distributed to locals/ trainees	Divisional Forest Officer, Aizawl Forest Division, Aizawl	Minutes of the meeting enclosed at *Annexure-IC*
3	Village (L3 level) at Zemabawk	Representatives of VFDCs, VCs and NGOs (YMA, MHIP and MUP).	GIM guidelines in local dialects may be prepared and distributed, rural outreach activities for data collection may be carried out the earliest	Member Secretary VFDC Zemabawk	Minutes of the meeting enclosed at *Annexure- IE*

3.6 Details of facilitators engaged in the process, institutions who prepared the micro plans and approval of the GRAm- Sabha

Table 19

Sl. No	Village	Institution who prepared micro-Plan JFMC/Others	Details of participation of all stakeholders/ departments	Approval of Gram-Sabha	Details of facilitators engaged
1	Zemabawk	Aizawl, FDA and Micro-Plan working Group as mentioned in para 3.1	Representatives of Government departments, Conservation oriented NGOs, VFDC, VC and the local public	Approved by Local Council, zemabawk Approval letter enclosed at *Annexure-IC*	Dr, Amit Kumar , Human Resource Development Deptt. MZU, Dr. F.Lalnunmawia Department of Forestry, MZU.

3.7 Details of involvement of district level committee in preparation of perspective plan especially of convergence mechanism

3.8 Details of the meeting/consultations with other departments in finalizing the convergence issues and perspective plan

Chapter 4
Activities proposed to be undertaken in the Sub-landscape(L2)

4.1 Current Land Use pattern

Current land use pattern has been mapped with interpretation of satellite imageries and field verification of interpreted data. The details are as under:-

Zemabawk village:

Table 20A

Sl. No.	Land use category	Area (Sq. kms)	% of total area	Remarks
1	LC Land	0.59	6.11	
2	Private land	7.73	80.10	
3	Horticulture Land	0.86	8.91	
4	Community Land	0.81	8.39	

Source: GIS cell, E&F dept, Mizoram

4.2 Proposed Land Use Pattern

After careful scrutiny of current land use pattern, needs assessment and consultation with stakeholders, the following land use is designed/proposed:

Zemabawk village:

Table 20 B

Sl. No.	Proposed land-use	Area (Sq. kms)	% of total area	Remarks
1	*Rehabilitation of shifting cultivation*	0.60	6.21	
2	*Plantation in urban & peri-urban Areas*	0.50	5.18	
3	*Farmers Land*	0.30	3.10	
4	*Highway /Roadside plantation*	0.15	1.55	
5	*Moderate dense Forest Cover Showing Degradation*	0.25	2.59	
6	*Eco- restoration of degraded open forest*	0.80	8.29	
7	*Community land*	7.05	73.05	

4.3 Treatments proposed

The following prescriptions (sub- missions / categories) are proposed to achieve the objectives under GIM through sustainable use of available natural resources:

Submissions:

Table 20 C

Sl. No.	Village	Submission/category			
		Enhance quality of forest cover and improving eco-system services	Ecosystem restoration & increase in forest cover	Agro forestry and social forestry (increasing bio-mass and creating carbon sink)	Enhancing tree cover in Urban and Peri-urban areas (including institutional lands)
1	Zemabawk	Stock enrichment planting to increase the quality of existing forests (ANR)	Plantation with indigenous species to improve ecosystem services (AR)	Raising of plantation along with agri-crops for generating additional income to farmers.	Afforestation activities with people's participation along the roads in school premises etc.

Cross – cutting interventions:

TABLE 20D

Sl. No.	Village	Alternate energy sources	Livelihood enhancement	Community conserved areas	Watershed management
1	Zemabawk	Provision of solar devices, LPG connection to BPL families	Support to forest based cottage industries for value addition of forest produce and marketing of value added products and also support to eco-tourism activities	Technical and financial assistance to village community as well as conservation oriented NGOs for sustainable management of the forests	Rain water harvesting, distributions of water tanks / retaining wall, soil and water conservation measures etc.

4.4 Objectives

Short term objectives

- Identification and arrest of drivers responsible for eco-system degradation
- Water-shed management – ridge to valley approach
- Increase in fuel-wood and fodder availability
- Employment generation
- Awareness for sustainable management of natural resources

4.5 Village-wise details of submissions proposed for treatment (Action plan)

Table 22A

Sl. No	Submission	Category	Proposed area (in Ha.)	Proposed cost (in lakh)	Livelihood activities	Proposed cost (in lakh)
1	***2***	***3***	***4***	***5***	***6***	***7***
1	*Enhance quality of forest cover and improving eco system services*	*a) Moderately dense forest cover but showing degradation*	*65*	*26.325*	*Supppport to Forest based cottage industries 10 unit @3* *Improvement planting with protection activities 50ha @0.2404* *Dist.. of rain water harvesting storage 20 nos.@1.5* *Const. of RCC Public water reservoir 1nos@ 15*	*63.018*
		b) Eco restoration of degraded open forests "Type (A)"	*60*	*25.920*		
		c) Eco restoration of degraded open forests "Type C"	*70*	*94.500*		
2	*Ecosystem restoration and increase in forest cover*	*Rehabilitation of shifting cultivation*	*90*	*72.900*		
3	*Enhancing tree cover in Urban & Peri-urban areas (Including institutional lands)*	*Plantation in Govt. offices/School compounds, etc.*	*30*	*81.00*		
4	*Agro forestry and social forestry (increasing bio mass and creating carbon sink)*	*a)Farmer's land including current fallows*	*65*	*35.100*		
		b)Highways/rural roads/Canals/ Tank bunds	*15*	*28.350*		
TOTAL			***395***	***364.095***		***63.018***

4.6 Treatment area under the landscape L2

Table 22A

Sl. No	Submission	Category	Proposed area (in Ha.)	Proposed cost (in lakh)	Livelihood activities	Proposed cost (in lakh)
1	***2***	***3***	***4***	***5***	***6***	***7***
1	*Enhance quality of forest cover and improving eco system services*	*a) Moderately dense forest cover but showing degradation*	*600*	*243*	*Supppport to Forest based cottage industries* *Improvement planting with protection activities* *Dist.. of rain water harvesting storage* *Const. of RCC Public water reservoir*	*939.726*
		b) Eco restoration of degraded open forests "Type (A)"	*800*	*345*		
		c) Eco restoration of degraded open forests "Type C"	*1200*	*1620*		
2	*Ecosystem restoration and increase in forest cover*	*Rehabilitation of shifting cultivation*	*1600*	*1296*		
3	*Enhancing tree cover in Urban & Peri-urban areas (Including institutional lands)*	*Plantation in Govt. offices/School compounds, etc.*	*400*	*1080*		
4	*Agro forestry and social forestry (increasing bio mass and creating carbon sink)*	*a)Farmer's land including current fallows*	*900*	*486*		
		b)Highways/rural roads/Canals/ Tank bunds	*200*	*378*		
TOTAL			***5700***	***5448***		***939.726***

4.7 Map showing details of the area proposed village-wise enclosed

- Attached as Annexure-B

4.8 The geo-references of the treatment locations enclosed in the prescribed format

- Attached as Annexure-C, D, E, F, G & H.

4.9 Details of support activities proposed in the landscapes including proposed cost and village-wise details wherever applicable

The eco-restoration of degraded forests and enrichment of existing forests will provide livelihood support to the local people through sustainable extraction of forest produce value addition and marketing of value-added products, in addition, provision has been made in the scheme to provide technical and financial support to the people for setting up forest-based cottage industries.

4.10 Details of each cross cutting intervention proposed under the mission with area details, geo-references, activities etc.

Zemabawk :

Table 22B

Sl. No	Cross cutting interventions proposed	Activities	Unit	Total Cost (In lakh)	Geo-references
1	Alternate energy sources	1) Provisions of LPG connection 2) Solar device	120 families 80 families	1.98 1.32	
2	Community livelihood enhancement	Financial support to micro cottage industries	10 units	60	
3	Community conserved areas	Improvement planting with protection activities	20 Ha. @ Rs. 32500/-	6.5	
4	Watershed management	Distribution of rain water harvesting storage i.e. Syntax Tank	40 @ Rs.15000/No.	6	
		Construction/ Development of RCC public water points	1. @ Rs. 150000/No.	1.5	

4.11 Promotion of alternative fuel energy

Table 23

Sl. No	Village	Work- items proposed	No. of beneficiaries		Total (Rs in lakh)
			No. of family	No. of beneficiary	
1	Zemabawk	LPG connection to BPL families	120	120	1.98 @ Rs. 3300/No.
		Solar device	80	80	1.32 @ Rs 3300/No.
		Village sub-total	200	200	**3.3**

Chapter 5
Activities proposed under convergence

5.1 Activities proposed under convergence

Table 23A

Sl. No	Village	Scheme	Imple-menting Agency	Area (Natural Resources Development Activities)		Other Activities (Social Sectors)	
				Works	Proposed funding	Activities proposed	Proposed funding (Rs in lakh
1	Zemabawk	NAP	FDA Aizawl/ VFDC	Afforestation (AR)	GIM & MOA	NAP	
2	Zemabawk		Agriculutre Deptt			Link Road	GIM & MOA
3	"		Horticulture	Seedling distribution	GIM & MOA		
4	"		KVI	Bee cages Distribution	GIM & MOA		

Chapter 6
Institutional Set-up for implementation in the landscape

6.1 GIM Committee

Various committees have been constituted by the State government vide notification dated No.B.11016/16/2011- FST dt 11th Nov 2014 for effective implementation of GIM in Mizoram. A copy of the notification is attached as *Annexure-IA*. The Committees, which have been constituted, are as under:-

a) State Forest Development Agency for "Green India Mission"/ State Mission Directorate
b) State Level Steering Committee
c) GIM Cell under Environment & Forest Department
d) Revamped FDA for Green India Mission
e) District Level Steering Committee
f) Village Level GIM Committee

6.2 Institutional Set-up for implementation in the landscape

Table 24

Sl. No	Village	Institutions proposed for implemen-tation	Sub-mission of area			Details of other activities
			Submission	Category	Area (ha.)	
1	Zemabawk	Revamped VFDC	*Enhance quality of forest cover*	*a) Moderately dense forest cover but showing degradation*	*50*	Provision of support to cottage industries
				b) Eco restoration of degraded open forests "Type (A)"	*70*	
				c) Eco restoration of degraded open forests "Type C"	*120*	
			Ecosystem restoration and increase in forest cover	*Rehabilitation of shifting cultivation*	*150*	
			Enhancing tree cover in Urban & Peri-urban areas (Including institutional lands)	*Plantation in Govt. offices/School compounds, etc.*	*35*	
			Agro forestry and social forestry (increasing bio mass and creating carbon sink)	*a)Farmer's land including current fallows*	*80*	
				b)Highways/rur	*15*	

				al roads/Canals/ Tank bunds		
			Alternate energy source	LPG connection to BPL families	120 families	
				Solar devices	80 families	
			Water shed management	Distribution of water tanks	20	
				Construction/ development of RCC public water points	1.	

Chapter 7
Livelihood Issues

7.1 Brief note on the forest dependency and livelihood issues village issues village – wise

7.1.1 Availability and Requirement of Fuel wood

Some of the households use fuel-wood as supply of LPG cylinders is much limited in the rural areas. The requirement and availability of fuel-wood is indicated below:-

Table 25

Sl. No.	Village	No. of households	Average fuel wood requirement per household (cum.)	Annual fuel wood requirement (cum)	Fuel wood availability (Annual Yield) (cum.)	Remarks
1	Zemabawk	1869	0.6	1121.4	1500	Nil

7.1.2 Availability and Requirement of Fodder

Very few households practice cattle rearing for livelihood support. Therefore, demand for fodder is comparatively low/insignificant.

7.1.3 Availability and requirement of Timber

Demand for timber used in house construction and furniture has been worked out and is indicated below:-

Table 26

Sl. No.	Village	No. of house-holds	Average timber requirement per household (cum.)	Annual timber requirement (cum.)	Timber availability (cum.)	Remarks
1	Zemabawk	1869	0.13	242.97	25	

7.1.4 Availability and Requirement of NTFP(s)

Bamboo, cane, thatch etc. are some of the important NTFP (s) which are extracted by the villagers from the forests. The demand as well as the availability for various NTFPs has been indicated below:-

Table 27

Bamboo (nos.)		Fuelwood (cum)		Broom(qtls)		Thatching grass (Bundles)	
Demand	Availability	Demand	Availability	Demand	Availability	Demand	Availability
34000	52000	1121.4	1500	64	97	789	1470

7.2 Details of activities to be carried out to address livelihood issues through Green India Mission including details of activities, beneficiaries, cost, village-wise plan etc.

Table 28

Sl. No	Village	Proposed livelihood activities	Role of facilitators if any engaged	Beneficiaries		Proposed cost (Rs. in lakh)	Remarks
				Family	No.		
1	Zemabawk	Technical and financial support to cottage industries	Provision of technical knowledge to improve quality and quantity of production as well as assistance in marketing	10	10	30	Cottage industries are required to produce handicraft like gasket, pot, local carriers, mat etc. from bamboo and cane.

Chapter 8
Baseline Survey

8.1 Baseline Survey

The baseline data for various parameters required for maintaining the outcomes of activities undertaken under GIM are given below:-

Zemabawk village:

Table 30

Parameters	Indicator	Baseline Status
1. Forest/tree cover on forest/ non-forest lands-in-the-Mission Target Area (MTA)	a) % of area with forest cover	44.45% (total forest area 4.29 sq km out of 9.65 sq km)
	b) % area in various forest density classes	1) Very dense =0.00 2) Moderately Dense =2.48%(0.24 sq km) 3) Open Forest =4290%(4.14 sq. kms.)
2. Eco-system services from targeted areas / landscapes	a) Shannon- Weiner Index	1.735 (details at *annexure*....)
	b) Biomass	Above Ground Biomass = 40181.995 tonnes Source: Field survey data
3. Soil	a) Depth of top soil	The soil is very deep in valley i.e. flatlands whereas in the hills it is deep to moderately deep
	b) Soil quality	The soils are lateric in nature, acidic upto 0 – 10 cm and coarse grain in the sub soil. The pH is normally 6.84. The soil organic carbon is measured 2.83% in 0-20cm in depth. The total nitrogen content of the soil in the depth was found to be 0.28%. The available phosphorous was found to be 6.00/g during rainy season. Exchangeable pottasium was measured at 959/g at 0 – 20 cm
4. Hydrology	a) Wetland area b) Stream beds/ water discharge c) Ground water, table – water level in wells/ springs	a) No wet lands in the area b) Spring and streams are found here. c) The area is hilly with variable elevation. Therefore, the ground water level varies. In the village settlement area, the

		depth of water in well is about 40 ft	
5. Annual Sequestration of Co2	Carbon sequestered in the target area.	Baseline Carbon Stock = 145431.2 tonnes	
6. Forest/ non-forest based livelihoods income	No. of targeted households (HH) reporting at least 25% increase in real income	Income (Rs. Annual)	No. of Households
		More than 5 lakh	243
		5 lakh >--- <50,000	965
		Less than 50,000	761
7. Quality of forest cover & ecosystem services of forest/non forests	a) % of forest area naturally regenerating	55% Source: GIS Cell, E&F Dept, Mizoram	
a) Moderately dense forests	b) Biomass	1654.147 tonnes (AGB)	
c) Open forests		28534.04 tonnes (AGB)	
d) Degraded grasslands		No degraded Grassland	
e) Wetlands		No wetland area	
8. Ecosystems are restored and forest cover is cover is increased in scrub, shifting cultivation areas etc.	% of area that is adequate stocked / productivity	NIL	
9. Forest and Tree cover in urban/peri-urban land	% of forest and tree cover in the targeted urban/peri-urban areas.	60.414% (5.83 sqkms out of 9.65 sqkms) Source: GIS Cell, E&F Dept, Mizoram	
10. Forest and tree cover on marginal agricultural lands/ fallow and other non- forest land under agro forestry/ social forestry	% of tree cover on non –forest land	84.766% (8.18sqkms out of 9.65 sqkms) Source: GIS Cell, E&F Dept, Mizoram	

11. Public forest/ non forests areas (taken up under the Mission) are managed by the community institutions.	% of area under management of community institutions	6.113% (0.59sqkms out of 9.65 sqkms) Source: GIS Cell, E&F Dept, Mizoram	
12. improved fuel wood-use efficiency and alternative energy devices adopted by households in MTA	% of HH reporting use of alternative energy devices	Total households = LPG users = Fuel-wood users = Fuel-wood only users= Solar devices users =	1869 1830 100 39
13. Forest/non forest based livelihoods of the people living in and around the forests are diversified.	% of HH reporting diversification of income sources	Source of income	No. of households
		Govt. Service	780
		Jhumming/Gardening	230
		Horticulture including WRC	120
		Business/Petty Trade	650
		Daily labourers	21
		Others	68

Chapter 9
Status of reforms proposed

9.1 Role of Gram Sabha (Village Council) in project planning, implementation and monitoring

Village level GIM committee has been constituted by the State Government vide notification No.B.11016/16/2011-FST Dt.11.11.2014 *(Annexure-IA)* for the following activities:-

1. To render support in the preparation of Perspective Plan,
2. To ensure implementation of planned and approved schemes (approved by the State Level Steering Committee and MoEFCC) with expected level of quality,
3. To promote active people's participation in the implementation of "Green Indian Mission" and
4. To provide feedbacks timely to concerned authorities for further improvement in programme implementation.

Further, VFDC would play key file in project planning, monitoring and implementation under GIM. Both the VFDC and the Village Level GIM Committee would work closely in coordination with Gram Sabha (Village Council).

9.2 Revamping of FDAs and SFDAs

SFDAs and FDAs (General Body as well as Executive Committee) have been revamped for formulating suitable plans and executing well-planned projects with people's participation under GIM in Mizoram. The SFDA (General Body) will provide overall guidance for effective implementation of "Green Indian Mission" in the State. It will also oversee implementation of the broad policy framework in achieving Mission goals and objectives. The Executive Committee of revamped SFDA has been entrusted with the following functions:

1. Approval of Perspective Plan as well as Annual Plan of Operations;
2. Preparation of annual reports on GIM implementation in the Sates;
3. Programmatic convergence at the landscape level

The revamped FDA (General Body) will deal with policy issues pertaining to cohesion and convergence of different programmes at the Panchayat/Village Council level for better outcomes from the mission. The Executive Committee of revamped FDA will arrange for preparation of perspective plan/annual plan and convergence of various programmes.

9.3 FRAs compliance in areas covered under L2 and L3s

Claims for rights in the forests would be settled strictly as per the relevant acts applicable in the State of Mizoram.

9.4 Easing out regulatory framework in felling and transportation of forest produce

There is need to simply the procedure for issuing documents enabling felling and transportation of forest produce. The MoEFCC has recently taken initiative for simplifying rules and procedures for issue of permits and transit passes in respect of trees grown on non-forest private lands. The State of Mizoram would work in this direction in a proper way to motivate tree planters on non-forest private lands and also protect the valuable forest wealth existing in the State.

9.5 Strengthening frontline formation of E&F department

Under Necessary actions would be taken for "Capacity Building" of frontline forest staff engaged in implementation of GIM in the State. Suitable training as well as required facilities would be provided to them for executing the planned works efficiently. It is expected that well-trained forest staff with people's participation would be able to deliver the desired output/outcomes GIM.

Chapter – 10
Mission Cost

10.1 Cost of the Mission

Item wise and Year-wise cost of the mission for various work items has been given in the table place din Annexure – A1, A2 & A3.

10.2 Mission sustainability

The mission will be executed with active participation of the local people. On completion of the project, crop productivity of the existing forest will increase substantially. Sustainable extraction of forest produce, value addition to forest produce as well as marketing of value added products will provide livelihood support to the people while maintaining ecological stability in the region. Thus the mission is economically viable and socially adoptable**.**

Abstract

	Table
1. Name of L1 landscape	*The State of Mizoram*
2. Name of L2 landscape	*Aizawl City*
3. Forest and non-forest area in L2	*Forest area- 128.42 sq.kms, Non-forest area- 79.16 sq.kms*
4. Drivers of degradation in the landscape	*Traditional practice of shifting cultivation, Lack of strategic and participatory land-use planning, excessive population pressure on the forests for fuel-wood, fodder, timber etc., inadequate scientific management of watersheds including rainwater harvesting.*
5. Results of problem analysis	*The analysis of survey data shows that the area is in need of proper scientific treatment to reduce or reverse the ongoing ecosystem degradation.*
6. Existing scheme implemented in the landscape	*NAP, NBM , NLUP & IAY*
7. Implementing agencies under GIM	*Revamped FDA, Aizawl*
8. GIM activities :-	
(a) Submission/Category	***Funding Rs. in lakh***
1. Enhancing quality of forest cover	*20.250*
a) Moderately dense forest cover but showing degradation	
b) Eco restoration of degraded open forests "Type (A)"	*30.240*
c) Eco restoration of degraded open forests "Type C"	*162.00*
2. Ecosystem restoration and increase in forest cover	*89.100*
3. Enhancing tree cover in Urban & Peri-urban areas (including institutional lands)	*135.00*
4. Agro forestry and social forestry (increasing bio-mass and creating carbon sink)	
a)Farmer's land including current fallow	*43.200*
b)Highways/ruralroads/Canals/ Tank bunds	*28.350*
Sub Total A	***508.140***

B *5. LPG connection to BPL families*	*3.96*
6. Solar devices	*2.64*
7. Distribution of water tanks	*6*
8. Construction of RCC public water points	***15***
Sub Total	***27.60***
(C) Other support activities	
1. Research	*10.295*
2. Publicity/Media/Outreach activities	*5.147*
3. Monitoring and Evaluation	*5.147*
4. Strengthening local-level institutions	*25.737*
5. Strengthening FDs	*25.737*
6. Mission organization, operation and maintenance, contingencies and overheads	*20.590*
Sub Total C	***92.653***
(D) Livelihood activities	*87.506*
Sub Total D	***87.506***
(E) Community conserved area and sacred groves	
1. Improvement planting with protection activities.	*6.5*
Sub Total E	***6.5***
Total (A+B+C+D+E)	***722.399***

WORKS DETAILS UNDER DIFFERENT SUBMISSIONS OF L3 LANDSCAPE " ZEMABAWK"

Sl. No	Sub-mission / intervention	Category	Type	Rate/Ha. (Rs.)	Total Phy target for 2016-17 to 2017-18	2016-17		2017 - 2018			2018 - 2019		2019 - 2020		2020 -2021		2021 - 2022		2022 -2023		Total Phy	Total amount
						Activity undertaken	Fin already achieved	Phy	Fin	Total	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin		
1	***2***			***3***				***6***	***7***		***8***	***9***	***10***	***11***	***12***	***13***	***14***	***15***	***16***	***17***	***22***	***23***
A .Sub Missions and Interventions																						
1	Sub-mission 1 : Enhancing quality of existing forest cover	Category a) Moderately dense forest cover but showing degradation	***ANR Without Plantation***		**25**	**11**																
			Advance work	9450		**7.14**	0.675	**14**	1.323		**25**	2.363									**50**	4.360
			Adv. Work (Bal of 2016-17)	9450		**3.86**		**3.86**	0.365													0.365
			Creation	15660				**7.14**	1.119		**14**	2.192	**25**	3.915								7.226
			Creation (Bal of 2016-17)	15660							**3.86**	0.604										0.604
			1st yr maintenance	9720							**7.14**	0.694	**14**	1.361	**25**	2.43						4.485
			1st yr main (Bal of 2016-17)	9720									**3.86**	0.375								0.375
			2nd yrs maintenance	3510									**7.14**	0.251	**14**	0.491	**25**	0.8775				1.620
			2nd yr main (Bal of 2016-17)	3510											**3.86**	0.135						0.135
			3rd yr maintenance	2160											**7.14**	0.154286	**14**	0.3024	**25**	0.54		0.997
			3rd yr main (Bal of 2016-17)	2160													**3.86**	0.0833				0.083
			Sub Total	40500		**11**	**0.675**	**25**	**2.806**	**3.481**	**50**	**5.853**	**50**	**5.901**	**50**	**3.211**	**42.86**	**1.263**	**25**	**0.54**		**20.250**
		Category b) Eco restoration of degraded open forests Type A 200 Plants /Ha.	***200 Plants / Ha (Type A)***		**30**	**13**																
			Advance work	8100		**12**	0.972	**17**	1.3770		**40**	3.24									**70**	5.589
			Adv. Work (Bal of 2016-17)	8100		**1**		**1**	0.081													0.081
			Creation	15390				**12**	1.847		**17**	2.616	**40**	6.156								10.619
			Creation (Bal of 2016-17)	15390							**1**	0.154										0.154
			1st yr maintenance	8100							**12**	0.972	**17**	1.377	**40**	3.24						5.589
			1st yr main (Bal of 2016-17)	8100									**1**	0.081								0.081
			2nd yrs maintenance	6480									**12**	0.778	**17**	1.102	**40**	2.592				4.471
			2nd yr main (Bal of 2016-17)	6480											**1**	0.065						0.065
			3rd yr maintenance	5130											**12**	0.616	**17**	0.872	**40**	2.052		3.540
			3rd yr main (Bal of 2016-17)	5130													**1**	0.051				0.051
			Sub Total	43200		**26**	**0.972**	**30**	**3.305**	**4.277**	**70**	**6.982**	**70**	**8.392**	**70**	**5.022**	**58**	**3.515**	**40**	**2.052**		**30.240**
			2500 Plants / Ha (Type C)		**50**	**17**																
			Advance work	25650		**14.2**	3.645	**33**	8.465		**70**	17.955									**120**	30.064
			Adv. Work (Bal of 2016-17)	25650		**2.79**		**2.79**	0.716													0.716
			Creation	53460				**14.21**	7.597		**33**	17.642	**70**	37.422								62.660
			Creation (Bal of 2016-17)	53460							**2.79**	1.492										1.492
			1st yr maintenance	20250							**14.21**	2.878	**33**	6.683	**70**	14.175						23.735
			1st yr main (Bal of 2016-17)	20250									**2.79**	0.565								0.565
			2nd yrs maintenance	18090									**14.21**	2.571	**33**	5.970	**70**	12.663				21.203
			2nd yr main (Bal of 2016-17)	18090											**2.79**	0.505						0.505
			3rd yr maintenance	17550											**14.21**	2.494	**33**	5.792	**70**	12.285		20.570
			3rd yr main (Bal of 2016-17)	17550													**2.79**	0.490				0.490
			Sub Total	135000		**17**	**3.645**	**50**	**16.777**	**20.422**	**120**	**39.966**	**120**	**47.240**	**120**	**23.143**	**105.8**	**18.944**	**70**	**12.285**		**162.000**

2	Sub-mission 2: Ecosystem restoration and increase in forest cover	Category a) Rehabilitation of shifting cultivation areas	***1100 Plants / Ha.***		**60**	**29**																
			Advance work	18360		**16.8**	3.077	**31**	5.692		**50**	9.18									**110**	17.949
			Adv. Work (Bal of 2016-17)	18360		**12.2**		**12.24**	2.247													2.247
			Creation	36450				**16.76**	6.109		**31**	11.300	**50**	18.225								35.634
			Creation (Bal of 2016-17)	36450							**12.24**	4.461										4.461
			1st yr maintenance	11340							**16.76**	1.901	**31**	3.515	**50**	5.67						11.086
			1st yr main (Bal of 2016-17)	11340									**12.24**	1.388								1.388
			2nd yrs maintenance	8100									**16.76**	1.358	**31**	2.511	**50**	4.05				7.919
			2nd yr main (Bal of 2016-17)	8100											**12.24**	0.991						0.991
			3rd yr maintenance	6750											**16.76**	1.131	**31**	2.093	**50**	3.375		6.599
			3rd yr main (Bal of 2016-17)	6750													**12.24**	0.826				0.826
			Sub Total	81000		**29**	**3.077**	**60**	**14.048**	**17.125**	**110**	**26.842**	**110**	**24.486**	**110**	**10.304**	**93.24**	**6.969**	**50**	**3.375**		**89.100**
3	Sub-mission 3: Enhancing tree covers in urban and peri urban areas	Category a) Plantation in urban and peri uraban areas	***2500 Plants/ Ha.***		**50**	**15**																
			Advance work	59400		**12.6**	7.492	**35**	20.790												**50**	28.282
			Adv. Work (Bal of 2016-17)	59400		**2.39**		**2.3865**	1.418													1.418
			Creation	81000				**12.614**	10.217		**35**	28.350										38.567
			Creation (Bal of 2016-17)	81000							**2.387**	1.933										1.933
			1st yr maintenance	59400							**12.61**	7.492	**35**	20.790								28.282
			1st yr main (Bal of 2016-17)	59400									**2.387**	1.418								1.418
			2nd yrs maintenance	35100									**12.61**	4.427	**35**	12.285						16.712
			2nd yr main (Bal of 2016-17)	35100											**2.3865**	0.838						0.838
			3rd yr maintenance	35100											**12.614**	4.427	**35**	12.285				16.712
			3rd yr main (Bal of 2016-17)	35100													**2.387**	0.838				0.838
			Sub Total	270000		**15**	**7.492**	**50**	**32.425**	**39.917**	**50**	**37.775**	**50**	**26.635**	**50**	**17.550**	**37.39**	**13.123**	**0**	**0**		**135.000**
4	Sub-mission 4: Agro forestry and social forestry	Category a) Farmers land including current fallows	***Farmers land***		**30**	**16**																
			Advance work	13500		**9.34**	1.261	**14**	1.890		**50**	6.75									**80**	9.901
			Adv. Work (Bal of 2016-17)	13500		**6.66**		**6.66**	0.899													0.899
			Creation	20250				**9.34**	1.891		**14**	2.835	**50**	10.125								14.851
			Creation (Bal of 2016-17)	20250							**6.66**	1.349										1.349
			1st yr maintenance	7020							**9.34**	0.656	**14**	0.983	**50**	3.51						5.148
			1st yr main (Bal of 2016-17)	7020									**6.66**	0.468								0.468
			2nd yrs maintenance	6750									**9.34**	0.630	**14**	0.945	**50**	3.375				4.950
			2nd yr main (Bal of 2016-17)	6750											**6.66**	0.450						0.450
			3rd yr maintenance	6480											**9.34**	0.605	**14**	0.907	**50**	3.24		4.752
			3rd yr main (Bal of 2016-17)	6480													**6.66**	0.432				0.432
			Sub Total	54000		**16**	**1.261**	**30**	**4.680**	**5.941**	**80**	**11.589**	**80**	**12.206**	**80**	**5.510**	**70.66**	**4.714**	**50**	**3.24**		**43.200**
		Category b) Highways/ Rural Roads/Canals/Tank bunds	***Roads/Canals/Tank Bunds***		**15**	**7**																
			Advance work	29700		**6.42**	1.907	**8.00**	2.376												**15**	4.283
			Adv. Work (Bal of 2016-17)	29700		**0.58**		**0.58**	0.172													0.172
			Creation	83700				**6.42**	5.374		**8.00**	6.696										12.070
			Creation (Bal of 2016-17)	83700							**0.58**	0.485										0.485
			1st yr maintenance	32400							**6.42**	2.080	**8.00**	2.592								4.672
			1st yr main (Bal of 2016-17)	32400									**0.58**	0.188								0.188
			2nd yrs maintenance	21600									**6.42**	1.387	**8.00**	1.728						3.115
			2nd yr main (Bal of 2016-17)	21600											**0.58**	0.125						0.125
			3rd yr maintenance	21600											**6.42**	1.387	**8.00**	1.728				3.115
			3rd yr main (Bal of 2016-17)	21600													**0.58**	0.125				0.125
			Sub Total	189000		**7**	**1.907**	**15**	**7.922**	**9.829**	**15**	**9.262**	**15**	**4.167**	**15**	**3.240**	**8.58**	**1.853**				**28.350**
TOTAL OF SUB MISSIONS					**260**	**121**	**19.029**	**260**	**81.962**	**100.991**	**495**	**138.269**	**495**	**129.026**	**495**	**67.980**	**417**	**50.381**	**235**	**21.492**	**495**	**508.140**

5	Promoting alternative feul energy	Biogas, solar devices, LPG, Biomass based systems, improved stoves	***Per Household***	3300				**100**	3.3	3.3	**100**	3.3									**200**	**6.6**
	TOTAL OF A			260	121	19.029	360	104.3	104.3	595	141.569	495	129.026	495	67.980	416.51	50.381	235	21.49	695	**514.740**
B	FOR SUPPORT ACTIVITIES																				
	Research (2%)								2.086		2.831		2.581		1.360		1.008		0.430		10.295
	Publicity/Media/Outreach activities 1%								1.043		1.416		1.290		0.680		0.504		0.215		5.147
	Monitoring & Evaluation (1%)								1.043		1.416		1.290		0.680		0.504		0.215		5.147
	Livelihood activities (17%)								17.73		24.067		21.934		11.557		8.565		3.654		87.506
	Strengthening local level institutions (5%)					0.03			5.185		7.078		6.451		3.399		2.519		1.075		25.737
	Strengthening FDs(5%)								5.215		7.078		6.451		3.399		2.519		1.075		25.737
	Mission organisation, Operation maintenance, Overheads (4%)								4.172		5.663		5.161		2.719		2.015		0.860		20.590
	TOTAL OF B								**36.50**		**49.549**		**45.159**		**23.793**		**17.633**		**7.522**		**180.159**
	TOTAL OF A+B								**140.8**		**191.12**		**174.186**		**91.773**		**68.015**		**29.014**		**694.899**

GREEN INDIA MISSION - AIZAWL FOREST DIVISION, MIZORAM

ANNUAL PLAN OF OPERATION (APO)

ZEMABAWK (L3) LANDSCAPE (2017-18)

Sub-Mission/ Intervention	Category	Items of Work	Rate per Ha. (in Rs.)	2017-18	
				Physical Target (in Ha.)	Financial Outlay (in lakh)
A.					
Sub-Mission- 1: Enhancing quality of forest cover and improving ecosystem services	a) Moderately dense forest but showing degradation	1) Advance Work	9450	14	1.323
		2) Creation	15660	11	1.723
		3)Adv. Work (Balance of 2016-17)	4050	11	0.446
					3.491
	b) Eco-restoration of degraded open forests (Type A)	1) Advance Work	8100	17	1.377
		2) Creation	15390	13	2.001
		3)Adv. Work (Balance of 2016-17)	1350	13	0.1755
					3.553
	b) Eco-restoration of degraded open forests (Type C)	1) Advance Work	25650	33	8.465
		2) Creation	53460	17	9.088
		3)Adv. Work (Balance of 2016-17)	8640	17	1.469
Sub total					**19.022**
Sub-Mission - 2: Ecosystem restoration and increase in forest cover (1.8 mha)	a) Rehabili-tation of Shifting Cultivation Areas	1) Advance Work	18360	31	5.692
		2) Creation	36450	29	10.571
		3)Adv. Work (Balance of 2016-17)	7290	29	2.114
Sub total					**18.376**
Sub-Mission - 3: Enhancing tree cover in Urban and Peri- Urban areas (including institutional lands	a) Plantation in Urban and Peri - Urban areas	1) Advance Work	59400	32	19.008
		2) Creation	81000	18	14.580
		3)Adv. Work (Balance of 2016-17)	13500	18	2.430
Sub total					**36.018**
Sub-Mission - 4: Agro-Forestry and Social Forestry (increasing biomass & creating carbon sink) : 3 m ha	a) Farmer's land including current fallows	1) Advance Work	13500	14	1.890
		2) Creation	20250	16	3.240
		3)Adv. Work (Balance of 2016-17)	5130	16	0.821
					5.951
	c) Highways/ Rural Roads/ Canals/ Tank Bunds	1) Advance Work	29700	9	2.673
		2) Creation	83700	6	5.022
		3)Adv. Work (Balance of 2016-17)	4590	6	0.275
Sub total					**7.970**
Total of A.					**94.381**
Sub-Mission 5: Promoting alternative fuel energy	Biogas, solar devices, LPG, Biomass-based systems, improved stoves	Perhousehold	3300	100	3.3
B. FOR SUPPORT ACTIVITIES					
Research (2% of A)					1.888
Publicity / Media (1% of A)					0.944
Monitoring & Evaluation (1%of A)					0.944
Livelihood improvement activities (17% of A)					16.045
Strengthening local – level inst. (5% of A)					4.719
Strengthening FDs (5% of A)					4.719
Mission organisation, operation and maintenance, contingencies and overheads (4% of A)					3.775
Total of C					**33.033**
GRAND TOTAL (A+B+C)					**127.415**

APPROVAL OF MICRO PLAN

Green India Mission (G.I.M) hnuaia Activities hrang hrang Zemabawk Micro-plan a propose te hi tha kan ti a, kan pawmpuia, hma la turin rem kan ti e.

(R.C. LALENGZAUVA)
Secretary

Secretary
Zemabawk Local Council
Aizawl

(DAVID-A)
Chairman
Local Council
Zemabawk Village

Chairman
Zemabawk Local Council
Aizawl

ZEMABAWK VILCAGE LEVEL - COMMITTEE ON G.I.M PROJECT.

A HUN : Dt 5th Dec 2014 (Friday) 6:30 P.M

A HMUN : Pu Davida In Zemabawk.

CHAIRMAN : Pu Lalsangpuia Pachuau Forester

MEMBER PRESENT

1) Pu Lalsangpuia Pachuau EF&CC Deptt (Appointed)
2) Pu R.C Lalengzauva Secretary L/C
3) Pu H. Lalramnaira VFDC Represent.
4) Pi Vanlalauvi MHIP "
5) Pu H. Lalthiangthlima YMA "
6) CUL Rosangg MUP "
7) C. Lawmkima Member local Council
8) Davida chairman —do—

Meeting chairman Pu Lalsangpuia Pachuau Forestervin Committee kaihruaiin Green India Mission GIM Project kalphung tur leh hmalak dan tur saifiahna a nei a. Heni zawh hian member ten GIM Project chu engtin tih thu leh an pawm thu an sawi hlawm a.

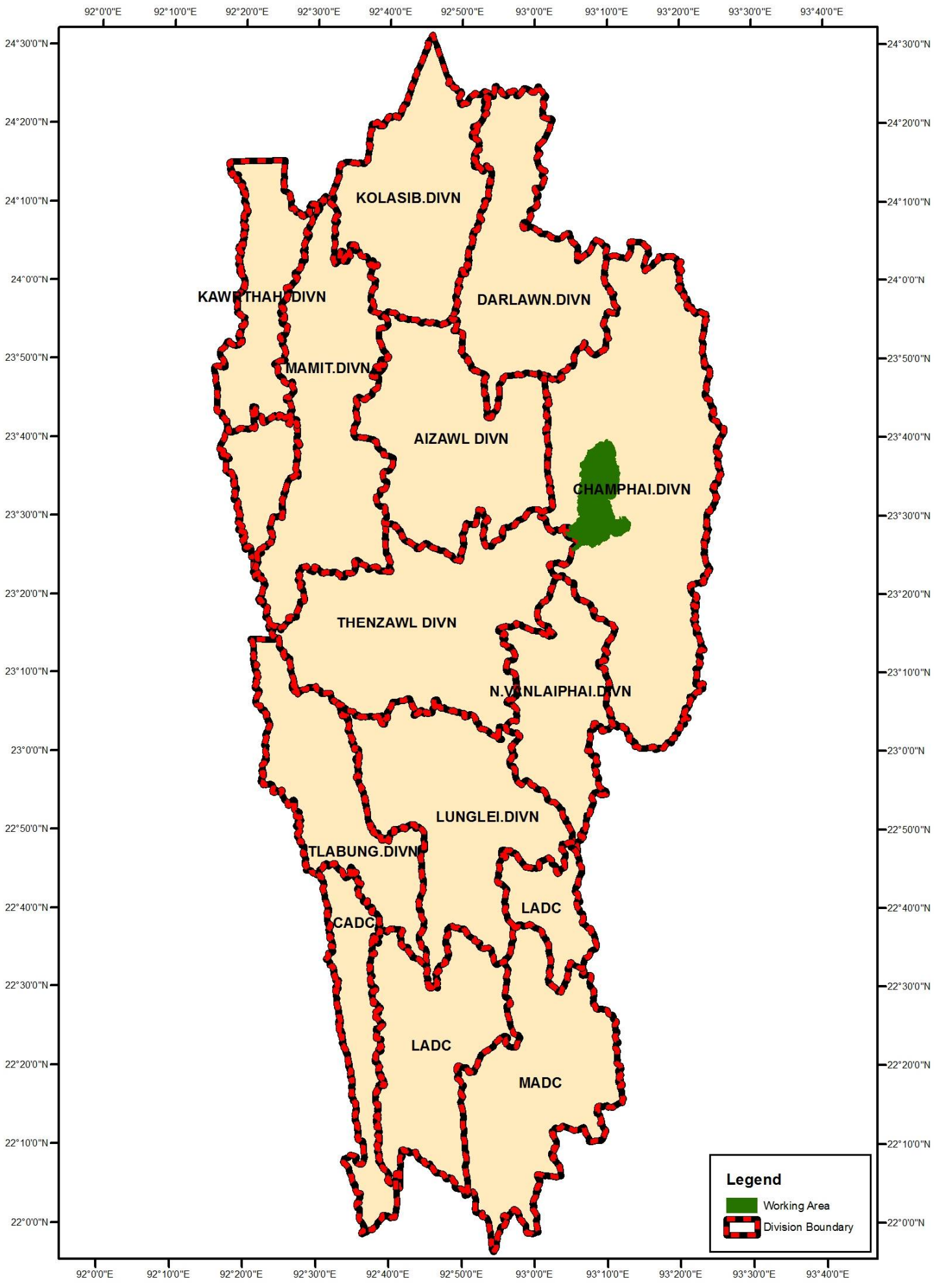
He GIM Project atana data pumpuah tur ang ang collect nghal a ni a. Heni zawh hian Committee kan tih ta a ni.

5/12/2014
(DAVID-A)
Meeting Secretary

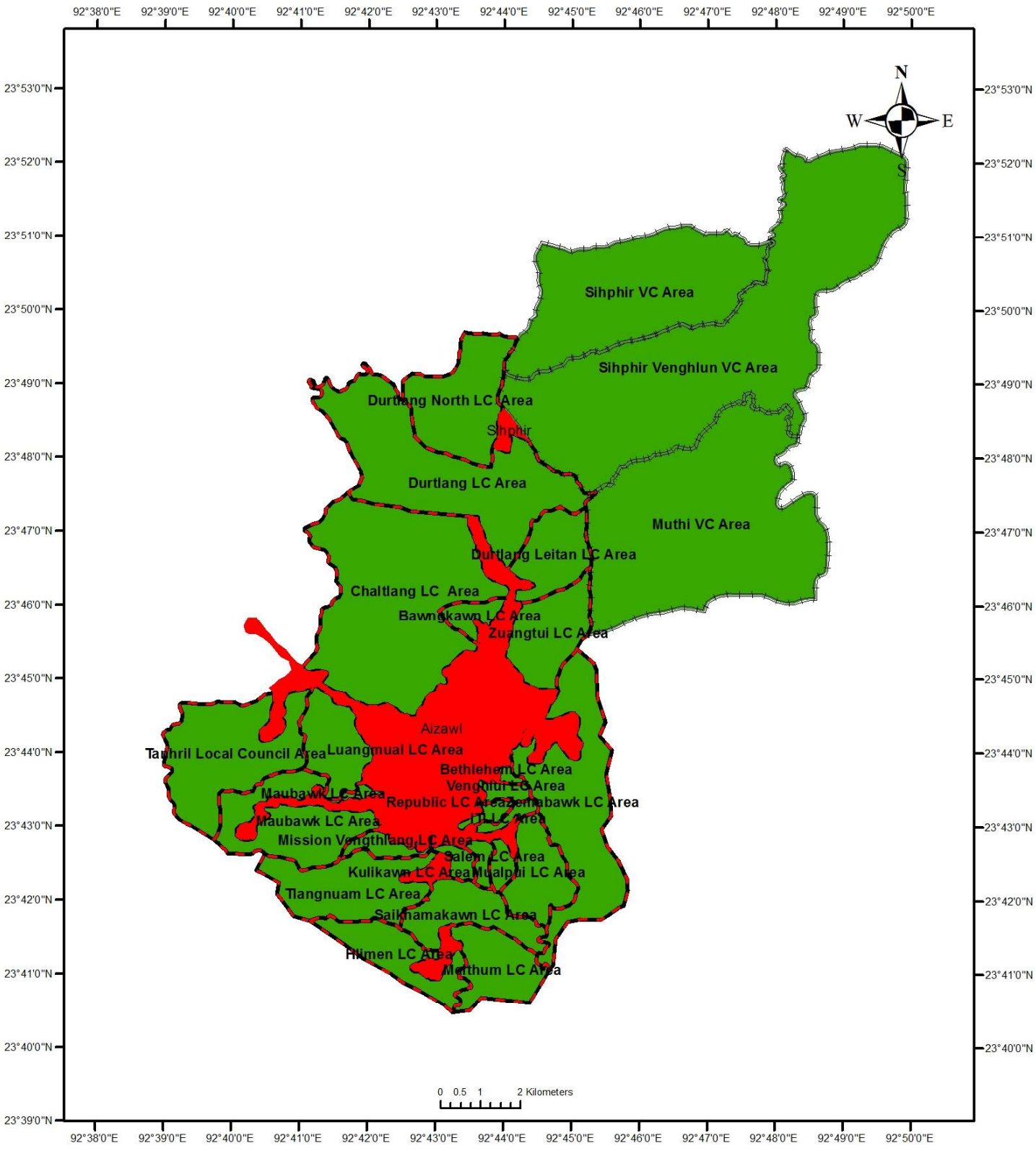
Chairman
Zemabawk Local Council
Aizawl

Chairman.
5/12/14
(LALSANGPUIA. PACHUAU)
Forester

MAP OF L1 LANDSCAPE MIZORAM



GEOGRAPHICAL MAP OF L2 LANDSCAPE AIZAWL FOREST RANGE : AIZAWL FOREST DIVISION



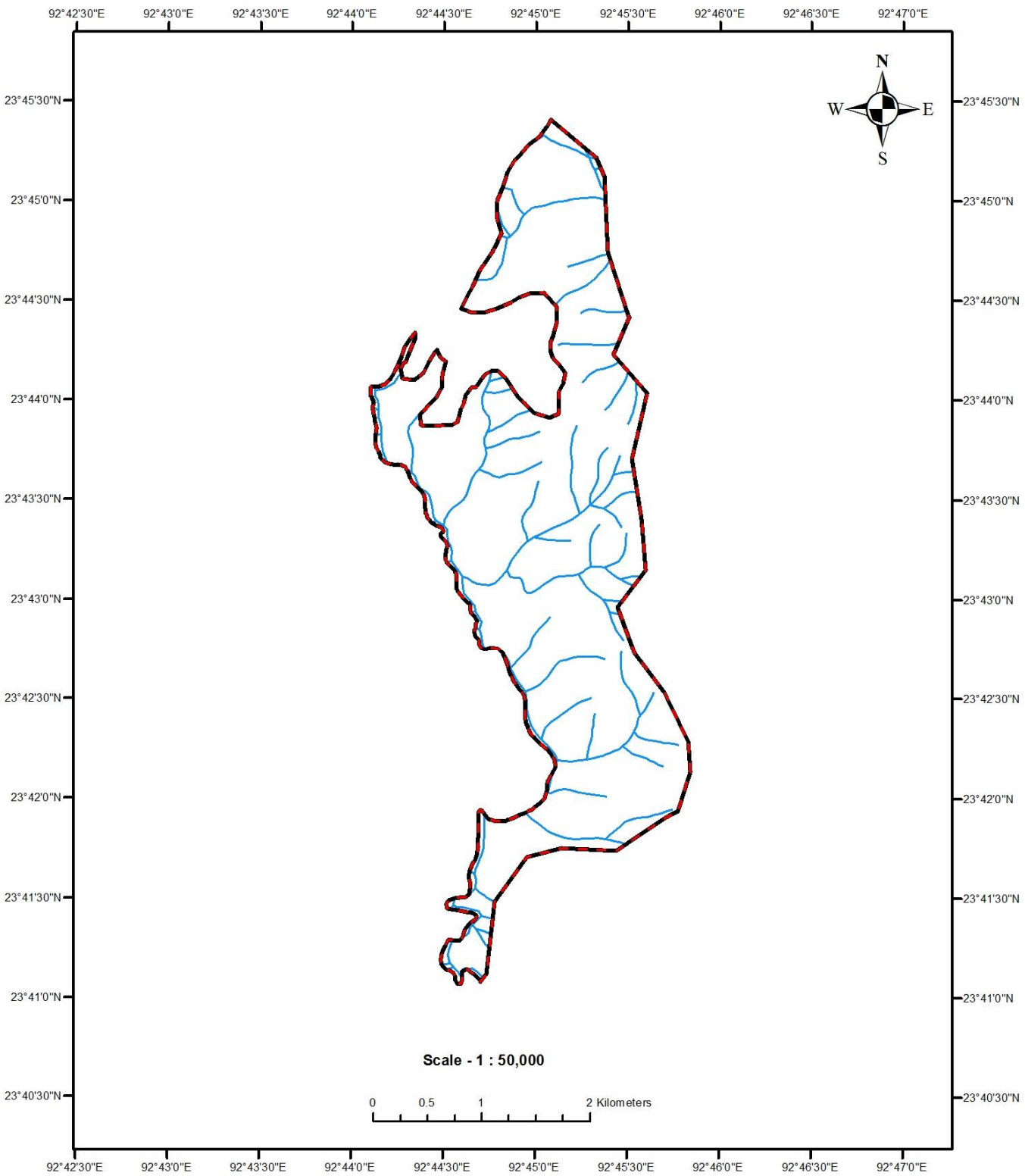
Local Council Area - 95.23 Sqkm
Village Council Area - 69.15 Sqkm
Tptal Working Area - 164.38 Sqkm

Legend

- Working Area
- Village Council Area
- Local Council Area
- Settlement

Prepared by
GIS Cell EF&CC Dept. Mizoram

DRAINAGE MAP OF L3 LANDSCAPE ZEMABAWK

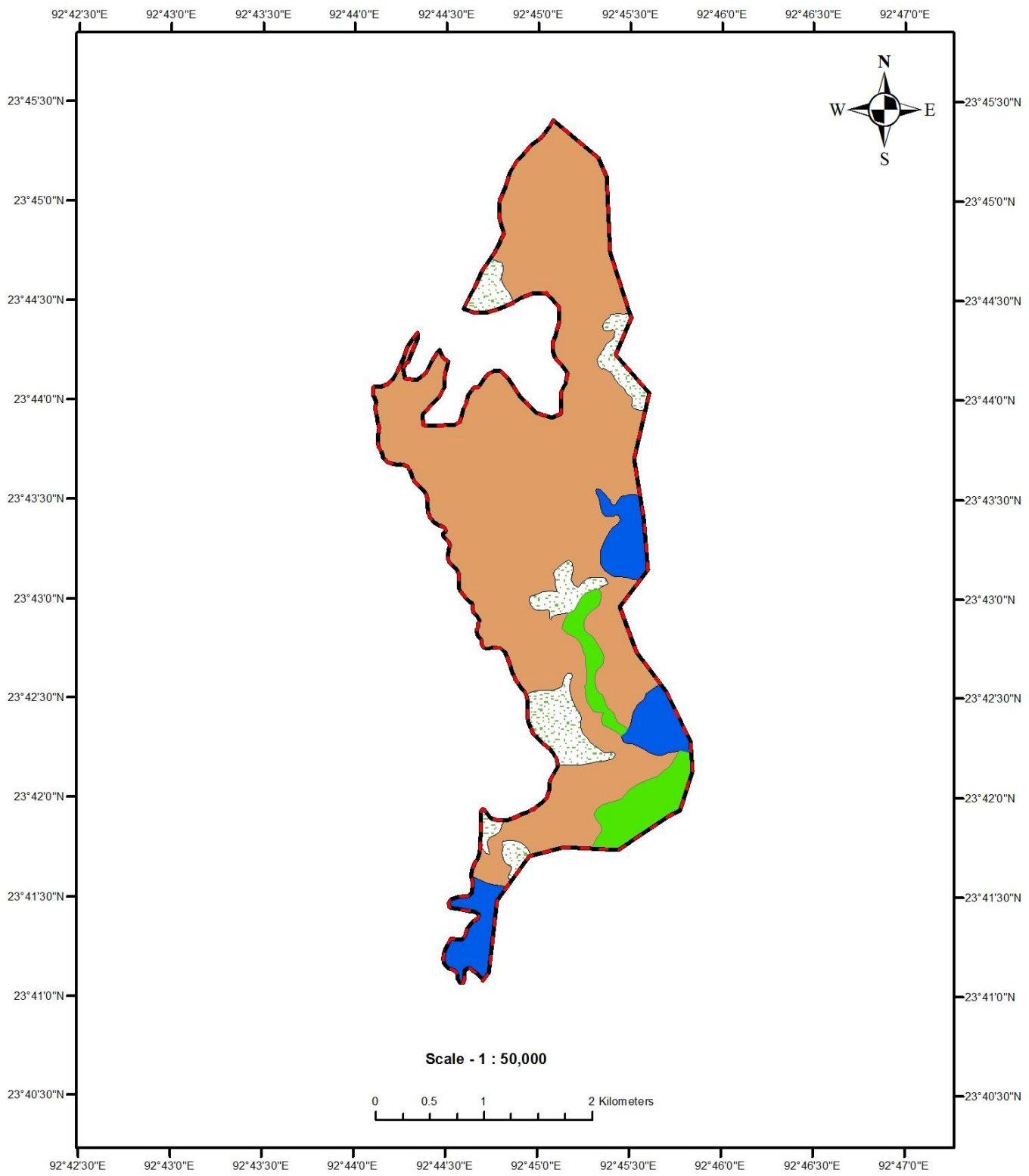


Legend

- Working Area
- Drainage

Prepared by
GIS Cell EF&CC Dept. Mizoram

LANDUSE MAP OF L3 LANDSCAPE ZEMABAWK



Working Area - 9.65 Sqkm
LC Land - 0.59 Sqkm
Private Land - 7.37 Sqkm
Horticulture Land - 0.86 Sqkm
Community Land - 0.81 Sqkm

Legend
- Working Area
- LC Land
- Private Land
- Horticulture
- Community Land

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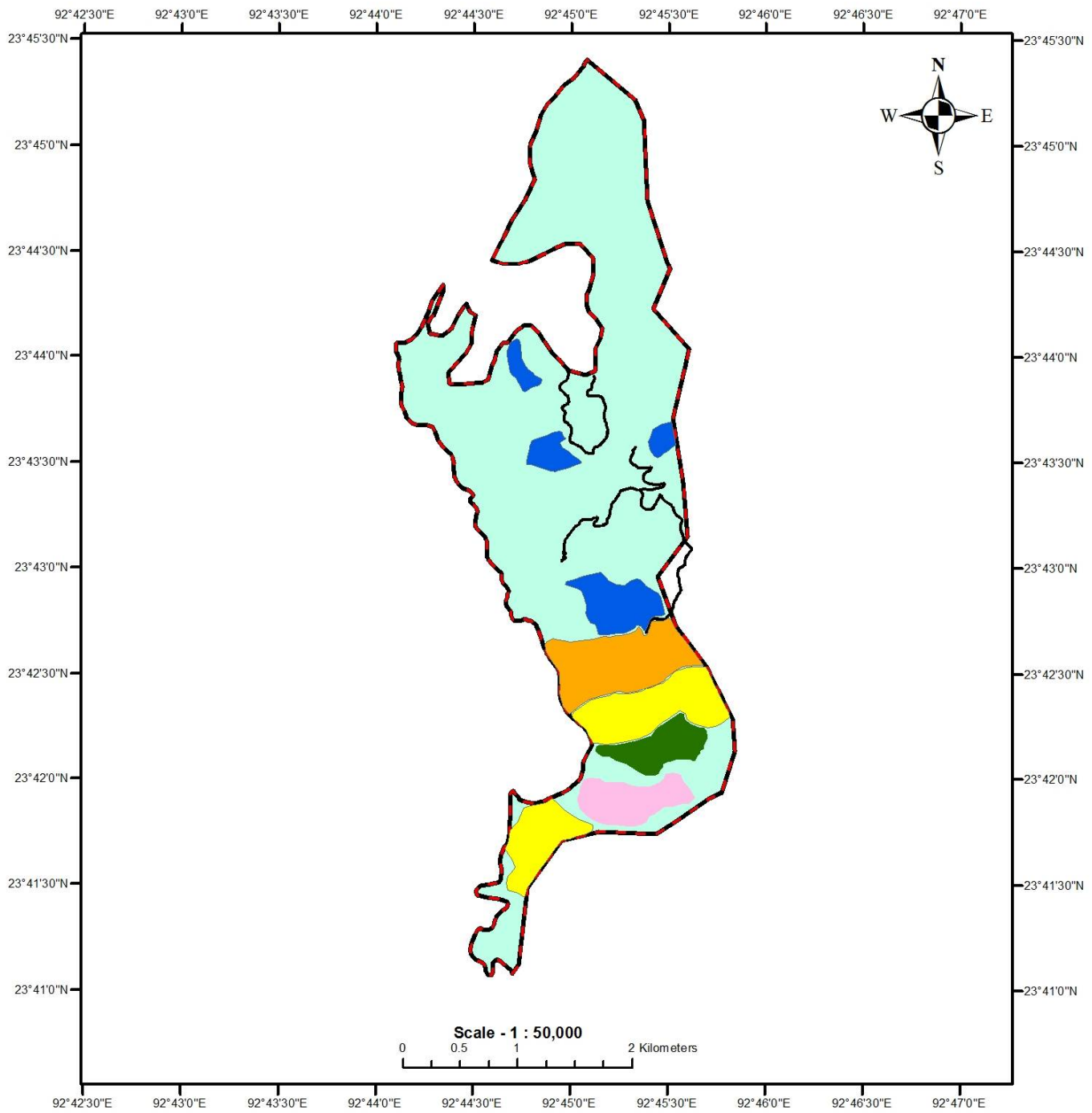
GIS Cell EF&CC Dept. Mizoram

PROPOSED LANDUSE MAP OF L3 LANDSCAPE ZEMABAWK



Working Area - 9.65 SqKm
Rehabilitation of Shifting Cultivation - 0.60 SqKm
Plantation in Urban & Peri-urban Areas - 0.50 Sqkm
Agro Forestry & Social Forestry :
1. Farmers Land - 0.30 SqKm
2. Highway/ Roadside Plantation - 0.15 Sqkm
Community Land :
1. Moderately Dense Forest Cover Showing Degradation - 0.25 SqKm
2.Eco-restoration of degraded open forest - 0.80 SqKm
Community Land - 7.05 Sqkm

Legend
- Working Area
- Community Land Moderately Dense Forest
- Community Land Degraded Open Forest
- Rehabilitation of Shifting Cultivation
- Plantation in Urban & Peri-urban Area
- Farmer Land
- Highway/Roadside Plantation
- Community Land

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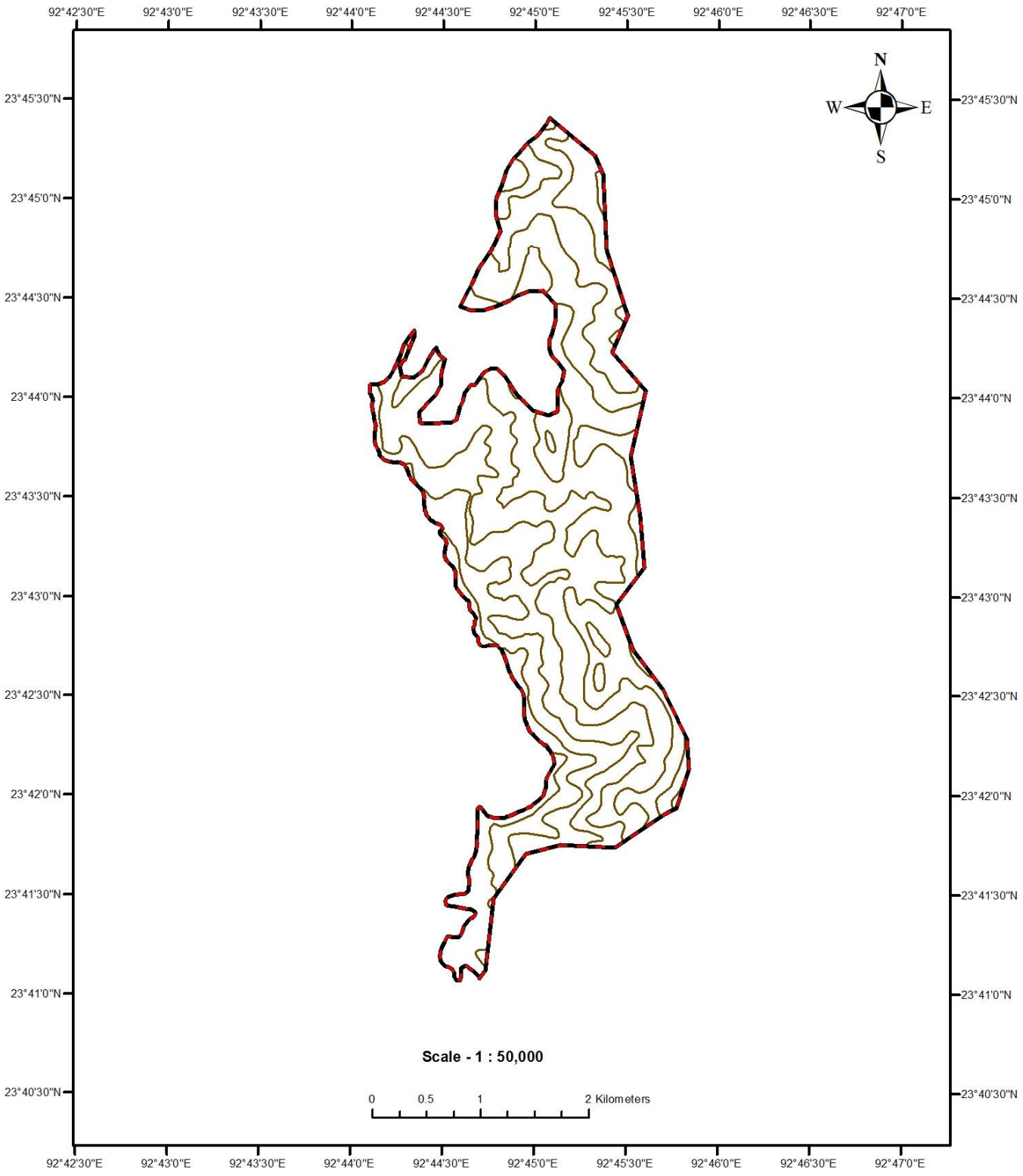
CONTOUR MAP OF L3 LANDSCAPE ZEMABAWK



Legend

- Working Area
- Contour

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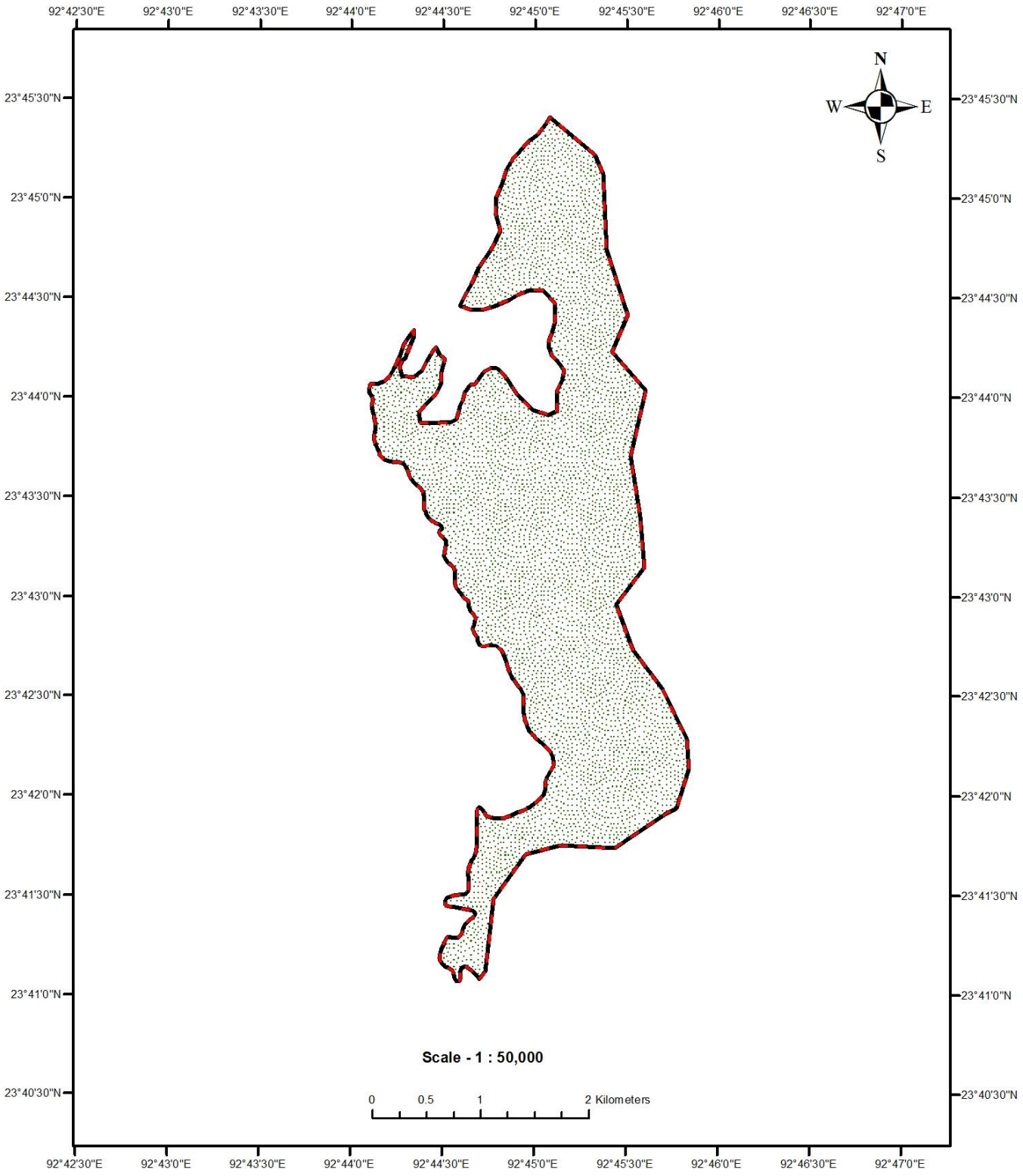
GEOGRAPHICAL MAP OF L3 LANDSCAPE ZEMABAWK



Legend

Working Area

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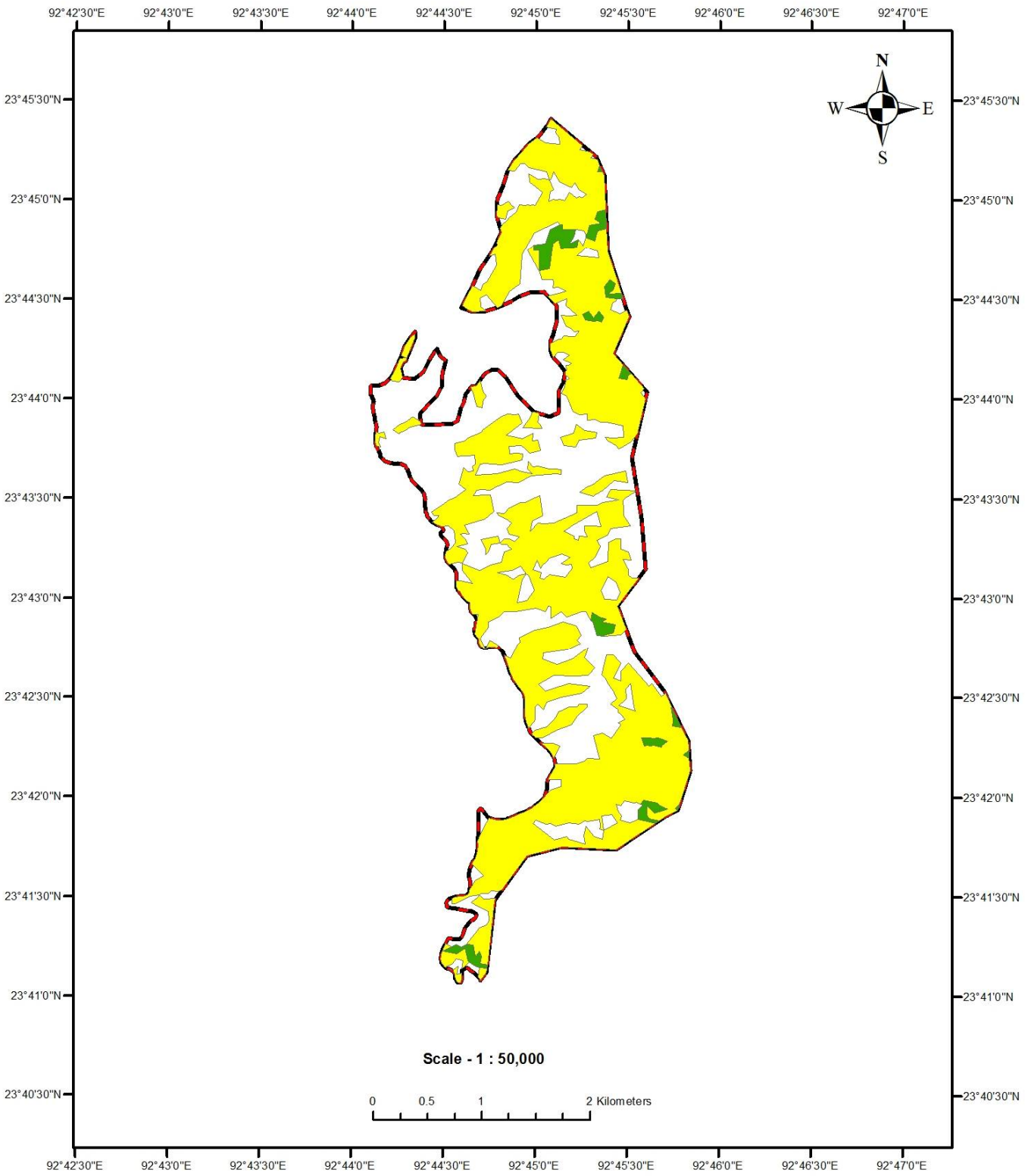
VEGETATION MAP OF L3 LANDSCAPE ZEMABAWK



Working Area - 9.65 Sqkm
Moderately Dense Forest - 0.24 Sqkm
Open Forest - 5.59
Non-Forest - 3.82

Legend
- Working Area
- Moderately Dense Forest
- Open Forest
- Non-Forest

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CALCULATIONS OF TOTAL CARBON STOCK 2017 AIZAWL L2
ZEMABAWK L3

Sl.No.	PLOT NO.	VOLUME	GS	AGB	AGC	BGB	DWB	LBM	SOC	CS	Total Forest area in Ha.
1	***2***	***4***	***5***	***6***		***7***	***8***	***9***	***10***	***11***	***13***
1	31	3.670099									583
2	41	3.7022155									
3	51	1.3996236									
4	52	3.9259712									
5	56	3.7263973									
6	64	1.0167417									
7	74	3.985725									
8	77	3.99427									
		25.421043	76.5809	68.9228	25.501437	32.393718	11.144817	3.271	57.14	249.453	
TOTAL			44646.7	40181.99	14867.338	18885.538	6497.4285	1907	33313	145431	

SHANON WEINER BIODIVERSITY INDEX
UNDER L2 AIZAWL

Zemabawk PLOT No.31			
Sl No	**Tree Species**	**No of trees**	**Shannon Index Calculation**
1	*2*	*3*	*4*
1	Bauhinia variegata	3	0.354349905
4	Albizzia chinensis	1	0.217990479
5	Stercelia Villosa	3	0.354349905
8	Lannea coromandelica	1	0.217990479
9	Gmelina arborea	2	0.309954199
11	Schima wallichii	1	0.217990479
	SUM:	***11***	***1.672625446***

PLOT No. 41			
Sl No	**Tree Species**	**No of trees**	**Shannon Index Calculation**
1	*2*	*3*	*4*
1	Albizzia Linensis	1	0.217990479
2	Bombax insigne	1	0.217990479
3	Erythrina Variegata	1	0.217990479
4	Rhus Semialata	3	0.354349905
5	Sterculia Vellosa	1	0.217990479
6	Albizzia prosera	2	0.309954199
7	Albizzia adoratissima	1	0.217990479
8	Gmelina arborea	1	0.217990479
9	Macaranga indica	3	0.354349905
10	Callicarpa arborea	2	0.309954199
11	Cordia fragrantissima	1	0.217990479
12	Albizzia Chinensis	2	0.309954199
13	Bauhinia Variegata	2	0.309954199
	SUM:	***21***	***3.474449959***

PLOT No. A1/51			
Sl No	**Tree Species**	**No of trees**	**Shannon Index Calculation**
1	*2*	*3*	*4*
1	Callicarpa arborea	1	0.217990479
2	Tectona grandis	2	0.309954199
3	Tectona grandis	1	0.217990479
4	Mangifera Indica	3	0.354349905
5	Schima wallichii	3	0.354349905
6	Albizzia Chinensis	2	0.309954199
7	Lannca coromandelica	2	0.309954199
	SUM:	***14***	***2.074543364***

PLOT No. A1/56			
Sl No	**Tree Species**	**No of trees**	**Shannon Index Calculation**
1	*2*	*3*	*4*
1	Schima wallichii	3	0.354349905
4	Vernicia Montana	2	0.309954199
6	Baihinia Variegata	1	0.217990479
7	Gmelina arborea	1	0.217990479
8	Aglaia Spectabilis	1	0.217990479
	SUM:	***8***	***1.318275541***

PLOT No.A1/64			
Sl No	**Tree Species**	**No of trees**	**Shannon Index Calculation**
1	*2*	*3*	*4*
1	Gmelina arborea	3	0.354349905
4	Derris robusta	2	0.309954199
6	Lannea coromandelica	1	0.217990479
7	Ficus Semicordata	1	0.217990479
8	Macaranga indica	2	0.309954199
9	Rhus Semialata	1	0.217990479
	SUM:	***10***	***1.62822974***

PLOT No. A1/74			
Sl No	**Tree Species**	**No of trees**	**Shannon Index Calculation**
1	*2*	*3*	*4*
1	Schima wallichii	4	0.367854877
2	Albizzia chinensis	2	0.309954199
3	Rhus Semialata	2	0.309954199
4	Bauhinia Variagata	2	0.309954199
5	Gmelina arborea	2	0.309954199
	SUM:	***12***	***1.607671671***

PLOT No. A1/77			
Sl No	**Tree Species**	**No of trees**	**Shannon Index Calculation**
1	*2*	*3*	*4*
1	Callicarpa arborea	2	0.309954199
2	Derris robusta	1	0.217990479
3	Bauhinia Variagata	2	0.309954199
4	Lannea Coromandelica	2	0.309954199
5	Bombax insigna	1	0.217990479
6	Schima wallichii	1	0.217990479
7	Erythrina Variagata	1	0.217990479
8	Albizzia Chinensis	2	0.309954199
	SUM:	***12***	***2.111778712***

TOTAL	13.88757443
SHANON WEINER INDEX	1.735946804