

## **Forest Restoration of Locally Important Species (FORLIS) & Package of Practices (POP)**

Objective 1: Improved local forests and biodiversity conservation as well as ecosystem services for marginalized communities.

### **Introduction:**

RNBA has been closely working with Indigenous/Tribal people for the past 35 years. Its focus thematic area is Sustainable Natural Resource Management and Livelihood. Our interventions are informed by the methods and knowledge systems of Tribal communities and our past experiences.

Indigenous communities in Northeast India have a deep and intricate relationship with the forests they inhabit. Their lives are closely intertwined with the forest ecosystem, and this connection is manifested in various aspects of their culture, livelihoods, and belief systems. Such communities in the hills of Manipur have developed interdependent system of agriculture and forestry that are best suited to the topographical terrain of the region and also established a deep understanding of local ecosystems and the species within them.

Planting native species in forest restoration activities has helped restore ecosystem functions, conserve biological diversity, cultural preservation, livelihood support, food security and diversify forest products (Elliott et al., 2003; Miyawaki, 2004; McNamara et al., 2006; Hall et al., 2011). Native shrubs, herbs, and climbers, in particular, provide habitat and food resources for wildlife, facilitate nutrient cycling, and contribute to the overall structural diversity of forests (Holl & Aide, 2011; Rey Benayas et al., 2009). Moreover, they often serve as pioneer species that colonize degraded areas, paving the way for the establishment of late-successional species (Capers et al., 2005). Additionally, these plant groups have been found to aid in erosion control, soil stabilization, and the suppression of invasive species (Martínez-Garza & Howe, 2003).

### **A. Background:**

The organization observed and learned the value of a sustainable forest management system which is practiced by the tribal communities from time immemorial and the need to create a multi-functional outlook that sustains both people and nature. With the thought to maintain, conserve and restore forest lands to support and accelerate the function of the wide range of ecological services that forests provide, the Forest Restoration with Locally Important Species (FORLIS) System was initiated.

FORLIS as a model works on the trifecta of preservation and conservation of forest by restoring its cover; livelihood sustainability and; documentation of culture and indigenous knowledge systems. The goal of the FORLIS system is to promote rural resurgence where community and local economy thrive by restoring locally important species while keeping the community's native forest intact.

### **B. Rationale:**

FORLIS model has been framed through our rigorous research, pilot studies, failures and successes. This model works on the trifecta of preservation and conservation of forest by restoring its cover; livelihood and; documentation of culture and indigenous knowledge systems.

This model is both our primary intervention and a localised model for forest restoration forest cover while providing sustainable livelihood opportunities and preservation of culture.

Primary focus area – Livelihood, Environment, Culture

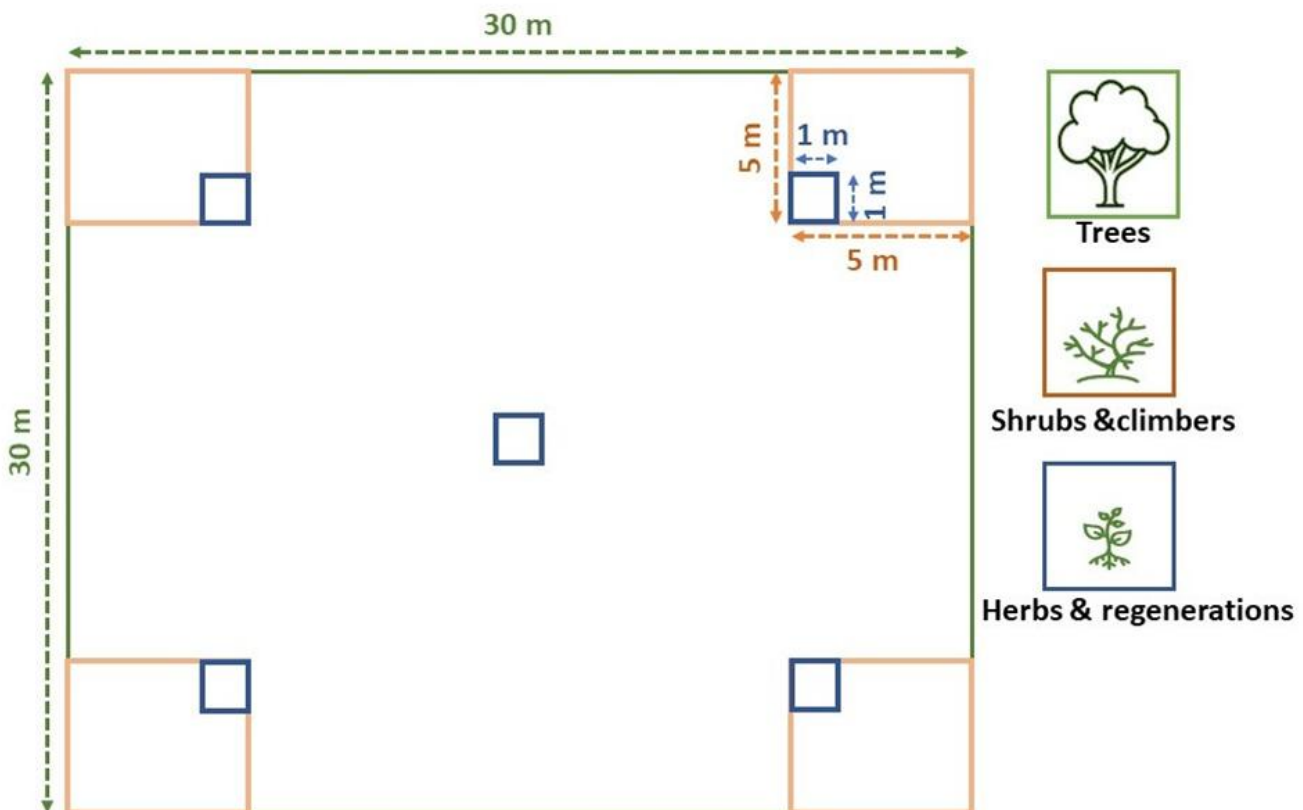
### C. Methodology:

**Household Survey:** Closed-ended questionnaires were collected using Kobo app in mobile phones to understand the household dependency on FORLIS/forest products.

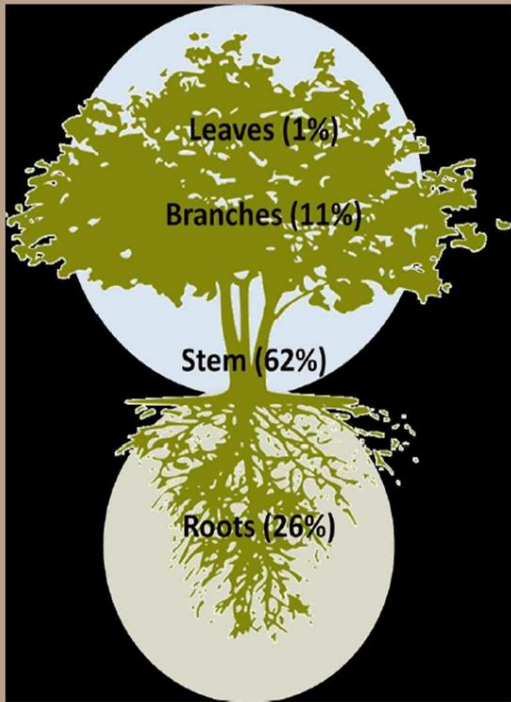
**Forest PRA:** FGDs and key informant interviews were conducted in the sampled villages to understand the relevance and process of FORLIS in the village, resource mapping, seasonality mapping, and documentation of traditional knowledge in respect to ethno-medicine and resource management.

**Vegetation analysis:** Two plots (FORLIS site and Control site) were sampled in each village. Within each sample plot, one 30x30 m, four 5x5 m and five 1x1 m quadrat were laid for vegetation analysis.

- 1) **30 x 30 m Quadrat (1 quadrat):** Measure the girth/diameter of the **Tree** at 1.37 meter from the ground (DBH- Diameter at Breast Height) and a rough estimate of the tree height. Also identify the tree species present within the quadrat and its count.
- 2) **5 x 5 m Quadrat (4 quadrats):** Identify & count the Nos. of **Shrub, Climber and Lianas** species
- 3) **1 x 1 m Quadrat (5 quadrats):** Identify & count the Nos. of **Herbs, Creepers, Tubers and Regeneration** species.

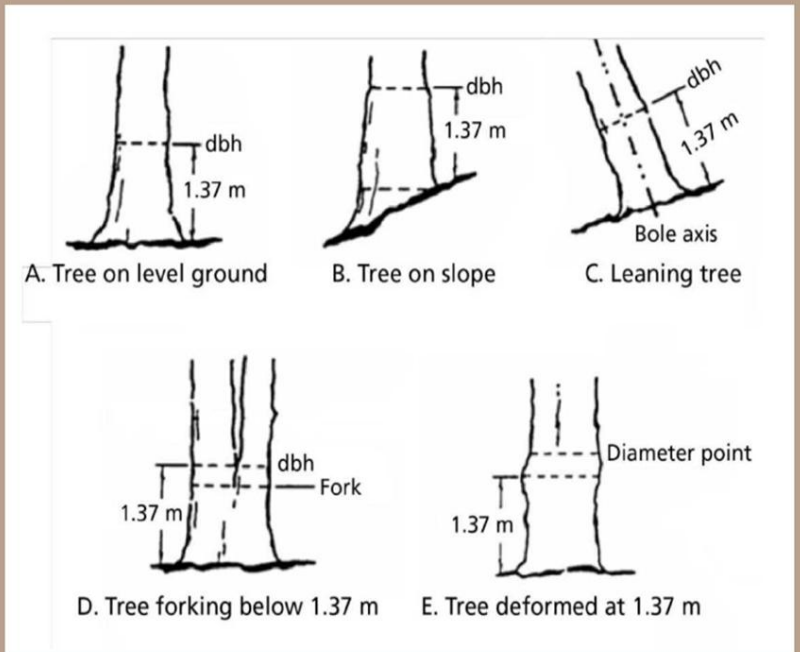


## Why measure DBH?



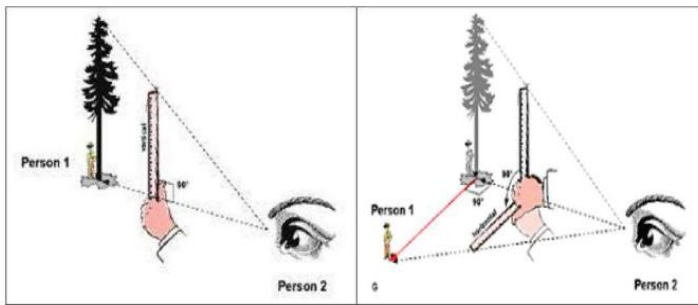
Tree biomass percentage

## How to measure DBH?

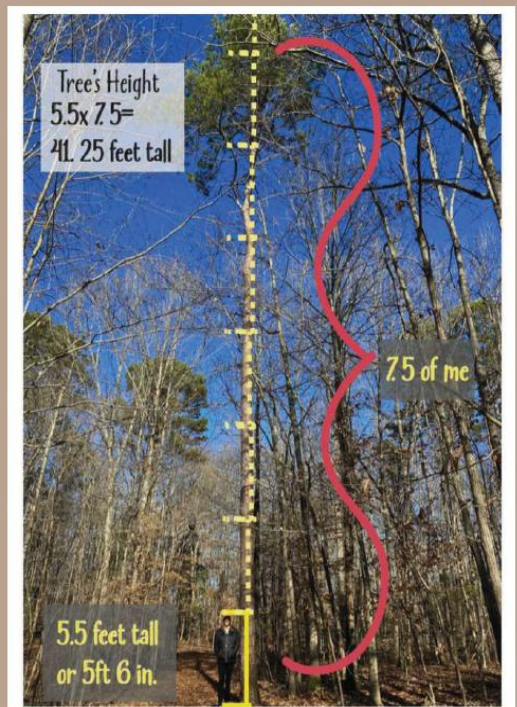


## How to estimate tree height?

### 1. With a pencil/ scale and an assistant



### 2. With a stick/ person of known height



**Forest Restoration of Locally Important Species (FORLIS) through community participation, we are doing the following package of practice:**

- 1) Formation of Committee through V/A & spreads the awareness on FORLIS to the community
- 2) Community identifies species which are native to the land (no foreign species) and carried out mass plantation
- 3) Only in some cases, we provide seeds and saplings. Otherwise most of the species are locally procured from the forest
- 4) Mapping the significance of each of the species (medicinal, aromatic, essential oils, food intake, house building, etc) label with local and common name of each plants
- 5) Assessment of the correlation between species and its market-value in different level
- 6) Prepare a plan with diversified species with the community members through committee
- 7) Institution Building and Capacity Building for VA, VDC or management committee –
- 8) Assist in market forward linkages for selling of the produces
- 9) Assist for institutional for processing units for spices, fruits, cane and bamboo and the skills to run these units
- 10) In parallel, we converge with various agencies to provide access to rights and entitlements
- 11) Assess the impacts after regular intervals as per species (short term, mid-term or long-term)
- 12) Regular monitoring and strict follow up along with community for larger positive impact
- 13) Evidence based register with proper documented materials such as register, photos and video clip

This is expected to gradually and sustainably increases the forest cover, preserve and conserve the environment, protect endangered species, preserve culture and indigenous knowledge systems and most importantly generate regular income without depleting natural resources.

The system is designed to restore locally important species without much interference from outside forces besides carefully assisting in site preparation and planting to actively restore and encourage their development spontaneously. FORLIS approach is not only substantially cost effective but also requires no long term intervention by NGOs or any other agency. This model has been implemented in some of our target villages in Tamenglong, Noney and other hill districts of Manipur. This system is designed in efforts to conserve biodiversity, enhance food security and community's economic stability based on proactive voluntary involvement by the community.

**Output:**

- 1) Awareness Building for restoration of forest cover, market value of species and significance of locally important species for Village Level Authorities and Civil Society Organisations
- 2) Develop IEC materials on climate change, forest restoration, and indigenous knowledge systems
- 3) Training for identifying species, documentation of oral history, topography
- 4) Form Village Development Committees inclusive of women and youth per village
- 5) Identification and mapping for species and land
- 6) Skilling for strategic agro-ecological practices
- 7) Planning of use of land and Non-Timber Forest Produces (NTFP)
- 8) Regular Monitoring and Evaluation while assessing the impact
- 9) Empowering local level institutions for managing and taking care of the forest
- 10) Mapping and documentation of the forest using GPS, documenting and recording plant species and processes on a regular basis for assessing the progress
- 11) Training young volunteers for better understanding of the cultural and traditional practices with scientific inputs

**Outcome:**

- 1) Autonomous and community driven decision making for the shared forest and land
- 2) Well informed Village Authority, Clan leaders, Village Development Committee and other key stakeholders about climate change, forest restoration, market linkages and livelihood practices.
- 3) Enhanced forest conservation activities
- 4) Built awareness, people more informed and concerned about their natural ecosystem
- 5) Enhanced local food basket and diversified nutrition intake
- 6) Increase in income

**Potential Impact:**

- 1) Increased income
- 2) Skilled agriculturalists
- 3) Community-driven development and participation
- 4) Increased forest cover
- 5) Diversified dietary intake and Food basket
- 6) Preservation of culture and indigenous knowledge systems
- 7) Conservation of important and endangered species
- 8) Restoration of forest based on indigenous cultural and traditional practices

**Overall Impact:**

The project is expected to gradually and sustainably increase the forest cover, preserve and conserve the environment, protect endangered species, preserve culture and indigenous knowledge systems and most importantly generate regular income without depletion and exploitation of natural resources.

**Success Indicators of the project:**

The people will be able to make decisions about their forest and land autonomously and well-informed which will also ensure that no private companies can exploit the natural resources. In the three-year's time period, the forest cover may not visibly increase but geo-mapping will ensure the success of converting unused land or depleted land to restoration. However, a tangible indicator is the increase in income. The community will have skilled agriculturalists who will know the effect of climate change and deforestation; will be able to identify, map and document local species; and become methodological and sustainable cultivators enhanced by indigenous knowledge systems

**Sustainability of the project:**

The programme model (FORLIS) has the capacity to sustain on its own due to the governance of the Village Development Committee and the community-driven approach. The strong system and policies with the community level institution, community benefits (income, food & nutrition, medicinal, religious, etc.) will guarantee sustainability. The indigenous traditional practices are continued with only minor changes which makes them non-apprehensive to new practice rather makes them skilled agriculturalists and entrepreneurs. The choice of local species (non-intrusive) will further ensure sustainability of the intervention. The income is only bound to increase as the forest is now used for both cultural and economic reasons and with our intervention, the sustainability aspect of culture and financial gains are instilled. The sustainability of the project is as per our observations and experiences with our on-going target villages.

*Few examples of what RNBA's is initiated*

**RNBA gather information from pilot surveyed**

**Rangkhung III & Bwanruangh Taudaizaeng Villages on Ethno-Medicinal uses of plants**

<b>Sl. No.</b>	<b>Disease name</b>	<b>Species name (Flower- FL, Fruit- F, Tuber-T, Leaves- L, Steam –S, Bark –B, Root- R)</b>
1	Fever	Nongmangkha (L), Raphai (L), Talang (L), Thangni (L), Thingbanam (L), Thalang (B)
2	Cough and cold	Nongmangkha (L), Ivy (L), Heimang (L), gooseberry (FR), Pongring (R)
3	Dysentery	Syang (L), yongchak (B), Guava (L), Ngang (B)
4	Blood Pressure (High)	Chlorodendron (L), Aralia (L, FR), Khang (L,S), Ganluak (L), Puking (L)
5	Blood Pressure (Low)	Khubutti (L,S, FR)
6	Sugar/ diabetic	Ash Gourd (FR), Betel nut (FR), gooseberry (B), KhuangBongthai (FR), Apeinuang (L)
7	Arthritis	Banamauai (L,T), Pudi (L), Talang (L), Karai (L is made into a paste and tied with a soft cloth above the joints)
8	Vomiting	Lemon(FR), Goose berry (FR)
9	Eye problem	Tupit (L), Kuang sing (L,R), Tamjinha(L), Mustard (L)
10	Head ache	Mustard (L), Honey Hive
11	Tooth Ache	Khubuti (L,S), Thangehag (Resin),
12	Stomach Ache/ pain	Chameiga (Black Turmeric), Kham (L), Thingkhump(R)
13	Removing Kidney stone	Touch Me not (Root), Flying squirrel urine
14	Clot bleeding	Chromolaena (L), Bamboo (B), Japan roof (L), Nagapuluai (L), Charcoal, Maikhutdui , Wild Pepper (L)
15	Snake Bite	Tamarind (T), Earth Worm, Colocasia (S)
16	Cancer	Meanuaru (Resin), Pukeamei (L), Leibaklei (R), Luikhummiumei (R), Garimmai
17	Hair Fall	Khui (S), Tajeihei (FR)
18	Bone Fracture	Ndun (L), Thingjikhengnei (L)
19	Gastric	Turmeric juice

## 1. FLOW OF SERVICES FROM FOREST- DOLLANG VILLAGE

To Livestock	To household	To farm	Outside village
Source of water to fisheries	Source of water to household	Source of water to terraces below the forest	Gives fresh air
Maintains good health of the livestock (cattle and cows)	Waterfall near Vangrep pang is an ideal spot for recreational activities (picnic, swimming)	Nutrient flow from forest to terraces	Maintains the water quality of Tupan river which flows to Shangi village and Oinupangba stream which flows to Lungleban village
Seed dispersal/ pollination from the droppings	Give fresh air for healthy life	Protect terraces from landslides	Protect from storm from damaging the crops/ paddy of Longsai and Jaojangtek villages
Provides shed and shelter to the livestock	Nutrient/ manure flow to homestead & flowers	Protect from storm which damages the crops/ paddy	Nutrient flow from forest to Longsai and Jaojangtek villages
	Forest protects the house from storm		Absorbs carbon dioxide/ cleanse the air
	Big trees protect vehicles & people from falling down the cliff in case of accidents		Occasional grazing habitat for livestock from Longsai and Jaojangtek villages
	Protect from the sunheat, rain and storm while foraging in the forest		Improve health condition of forest product buyers in Bishnupur and Imphal markets
	Absorbs carbon dioxide/ cleanse the air		



**Genus Gnetum (*Gan-makhian*)**



**Rhynchotechum (*gan-kariak*)**



**Frankincense (*Agao*)**



**Meliaceae (*Ganluakbang*)**



**Aralia (*Lai in Rongmei & Chonbeh in Kuki*)**



**Sugandh Mantri (*Mantri bi*)**

*End document*