# FARMERS' MANAGEMENT OF FALLOW SUCCESSION IN THAILAND

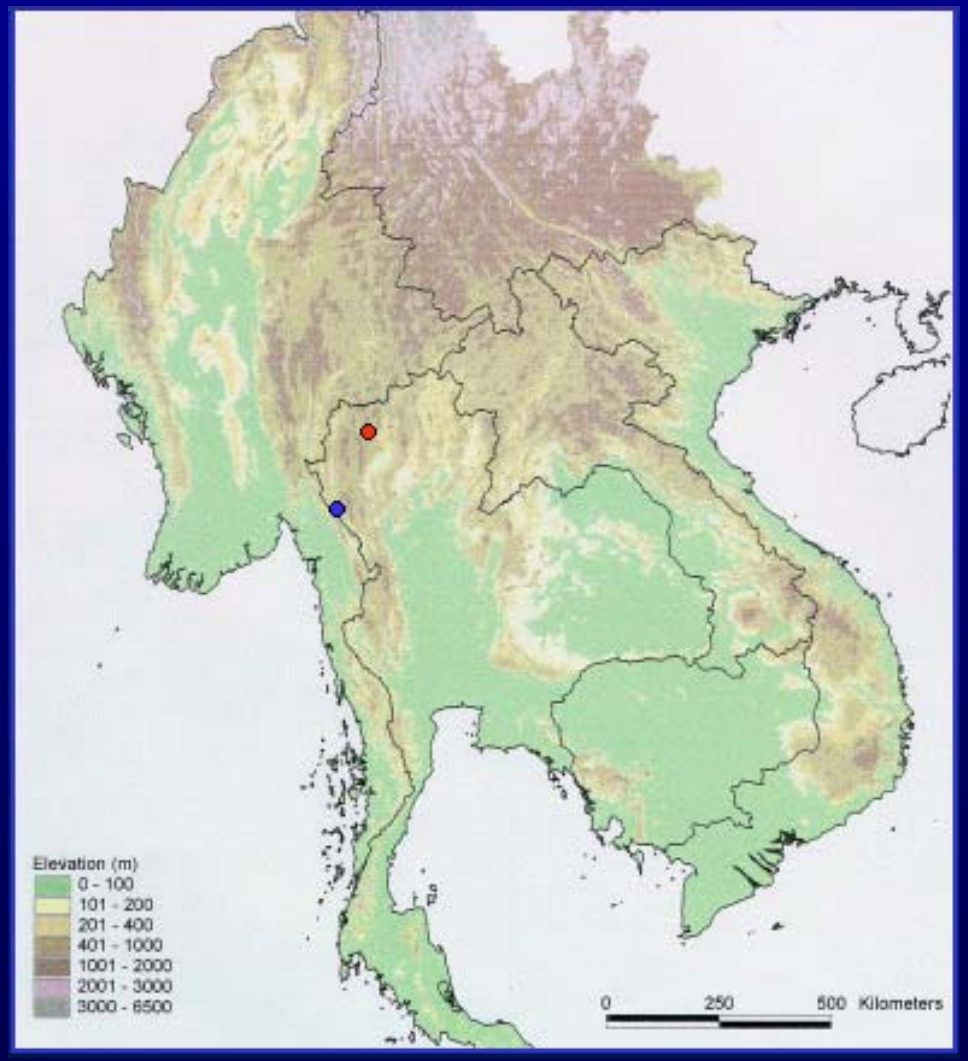
1. PLEC Demonstration Sites and Country Background

2. Some Thought About Management of Fallow Succession and Sustainability of Shifting Cultivation

3. Farmers' Management of Fallow Succession in PLEC Demonstration Sites

4. Conclusions

# Mainland Southeast Asia and PLEC Demonstration Sites




- Pah Poo Chom (Hmong)
- Tee Cha (Karen)

# Extent of land under shifting cultivation in mountainous area of Mainland Southeast Asia

| Country | Area ($10^3$ ha) | | | %Forest under S.C. |
|---|---|---|---|---|
| | Land | Forest | S.C. | |
| Cambodia | 17,652 | 12,163 | n.a | n.a |
| Laos | 23,080 | 13,173 | 400 | 3.04 |
| Myanmar | 65,774 | 28,856 | 181 | 0.60 |
| Thailand | 511,770 | 12,735 | 400 | 3.14 |
| Vietnam | 32,536 | 8,312 | 3,500 | 42.11 |
| Yunnan (Tropical China) | 46,000 | 920 | 130 | 14.13 |

S.C. = Shifting Cultivation

# Traditional Shifting Cultivators in Northern Thailand: *the ethnic minority groups*

***Pioneer Type***

**Slashing and burning of primary forests and plots used exhausively before moving to a new site.**

1. **Hmong**
2. **Lisu**
3. **Lahu**
4. **Akha**
5. **Yao**

***Rotational Type***
**(Established Swidden)**

**Farming in secondary forests on rotational basis. Fixed cultivation within village territories**

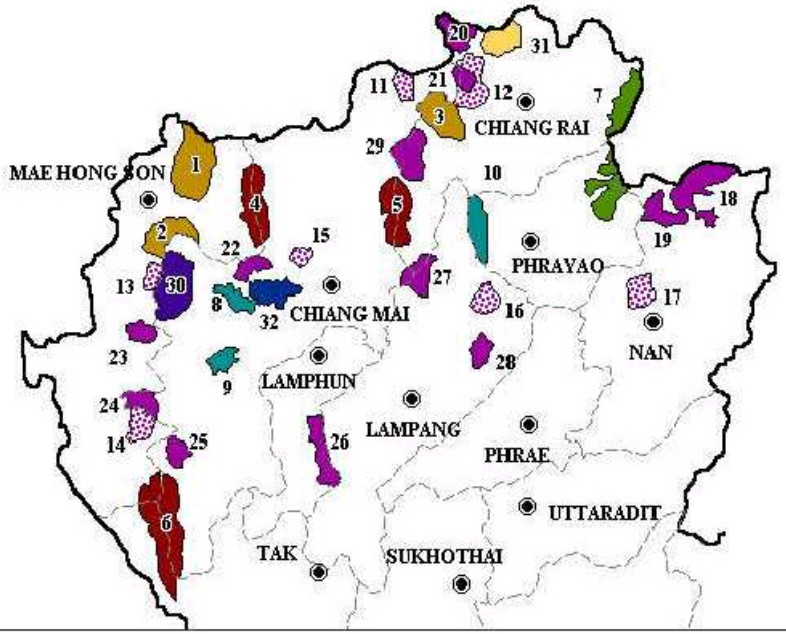
6. **Karen**
7. **Lua**
8. **Khamu**
9. **H'Tin**

# Changes in Thailand

- Rapid change appears in 1972-1998 with the introduction of highland development idea to the ethnic minority groups

- The highland development has set priority on eradication of opium growing (*national and international agenda*) and stop shifting cultivation with encouragement of permanent settlement and granting of nationality (*national agenda*)

# MAJOR HIGHLAND PROJECTS




TG-HDP
1. Huai Pooling
2. Pang Mapha
3. Tambon Wawi

UN PROJECTs
4. Doi Sam Mun
5. Wiang Pha
6. Pae Por
7. Doi Yao-Pha Mon

TN HDP
8. Mon Ya
9. Khao San Aen
10. Pha Dang

TA-HASD PROJECT PHASE 1
11. Lo Pa Khrai

PHASE 2
12. Mae Chan
13. Hua Porn
14. Mae Chang
15. Mae Ta Man
16. Mae Mee
17. Mae Khaning
18. Tung Chang
19. Chiang Klang
20. Huai Mae Kum
21. Huai Lu
22. Khun Saab
23. Huai Peung
24. Mae Rid Pa Gae
25. Tung Loy
26. Tung Hua Chang
27. Mae Mee
28. Mae Sarn
29. Mae Suay

30. Mae Chaem WDP
31. Doi Tung HDP
32. Mae Sa WDP

LEGEND

PROVINCE
INTER. BOUNDARY
PROV. BOUNDARY

N

# Impact of Development on Management of Shifting Cultivation

- Former shifting cultivators stopped growing opium and facing difficulties in managing agricultural alternatives

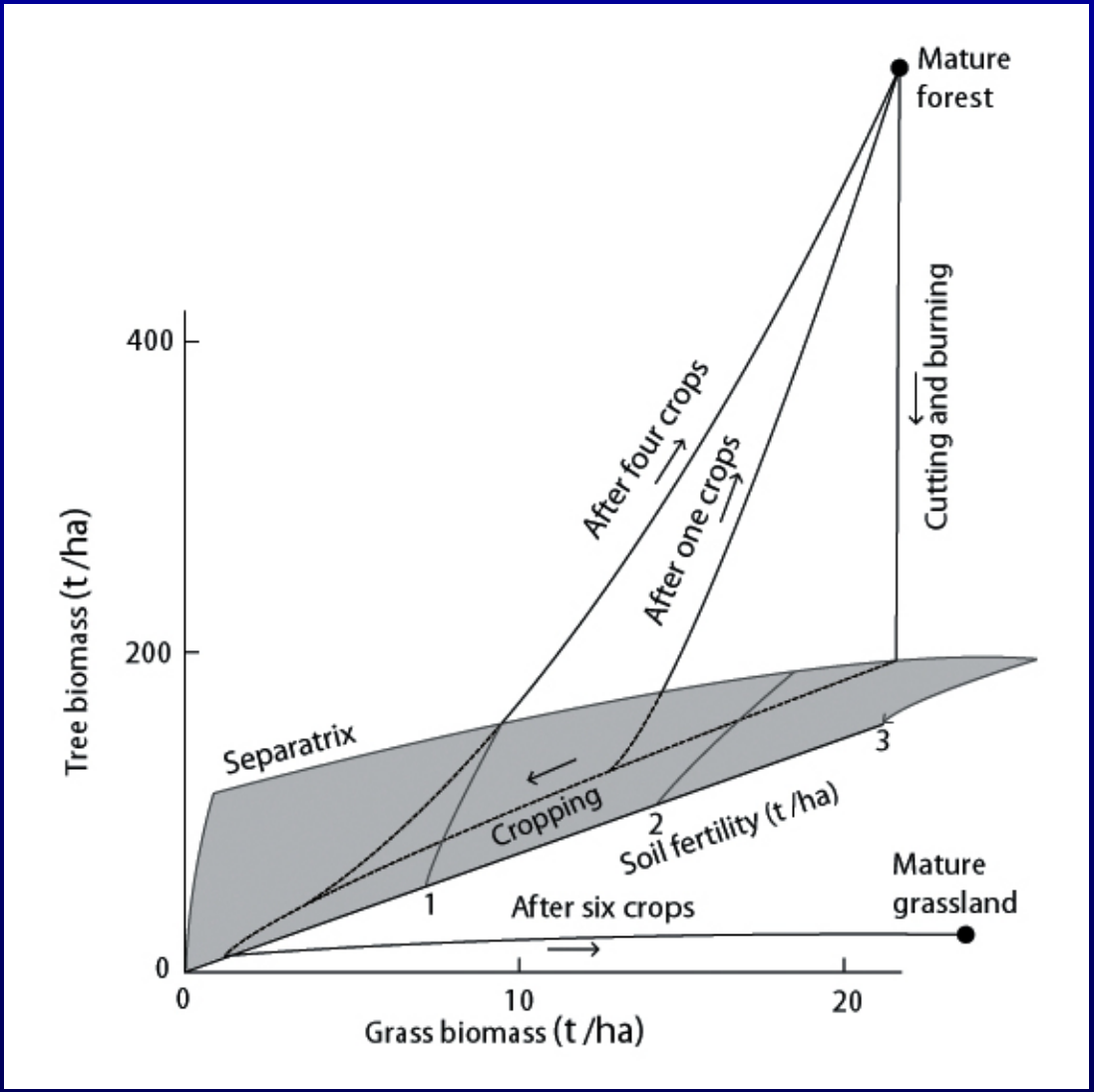
  Intensive cropping with cash crops and vegetables

  Shorter fallow to maintain adequate production from subsistence crops

- Enforcement of government rules and regulation for forest protection and watershed conservation since 1985 further accentuates land use limitation on the shifting cultivators

# Population in specific land categories above 600 m from the sea level, 1997

| Land Category | National | Northern Region | Percentage of National |
|---|---|---|---|
| Reserve forest | 611,400 | 589,279 | 94.6 |
| National parks | 39,421 | 37,877 | 96.1 |
| Wildlife sanctuaries | 40,600 | 30,900 | 76.1 |
| No hunting area | 2,001 | 1,957 | 97.8 |
| De-gazetted area | 283,878 | 250,104 | 88.1 |
| Planned reserves | 8,322 | 8,322 | 100.0 |
| Military occupied land | 5,500 | N.A. | - |
| Total | 991,122 | 918,439 | 92.7 |




**Management of fallow succession and sustainability of shifting cultivation systems (Trenbath et. al. 1985).**

# **Farmers' Innovations:** ***Agrodiversity Management for Shorter Fallow Systems***

- Introduced measures, e.g. bench terracing, grass strips, alley cropping, improved agroforestry and SALT, have been attempted with limited success
  - Farmers rely on their management of fallow to overcome limitation on land use
  - Management of weed succession
- Management of bush fallow/secondary forest succession

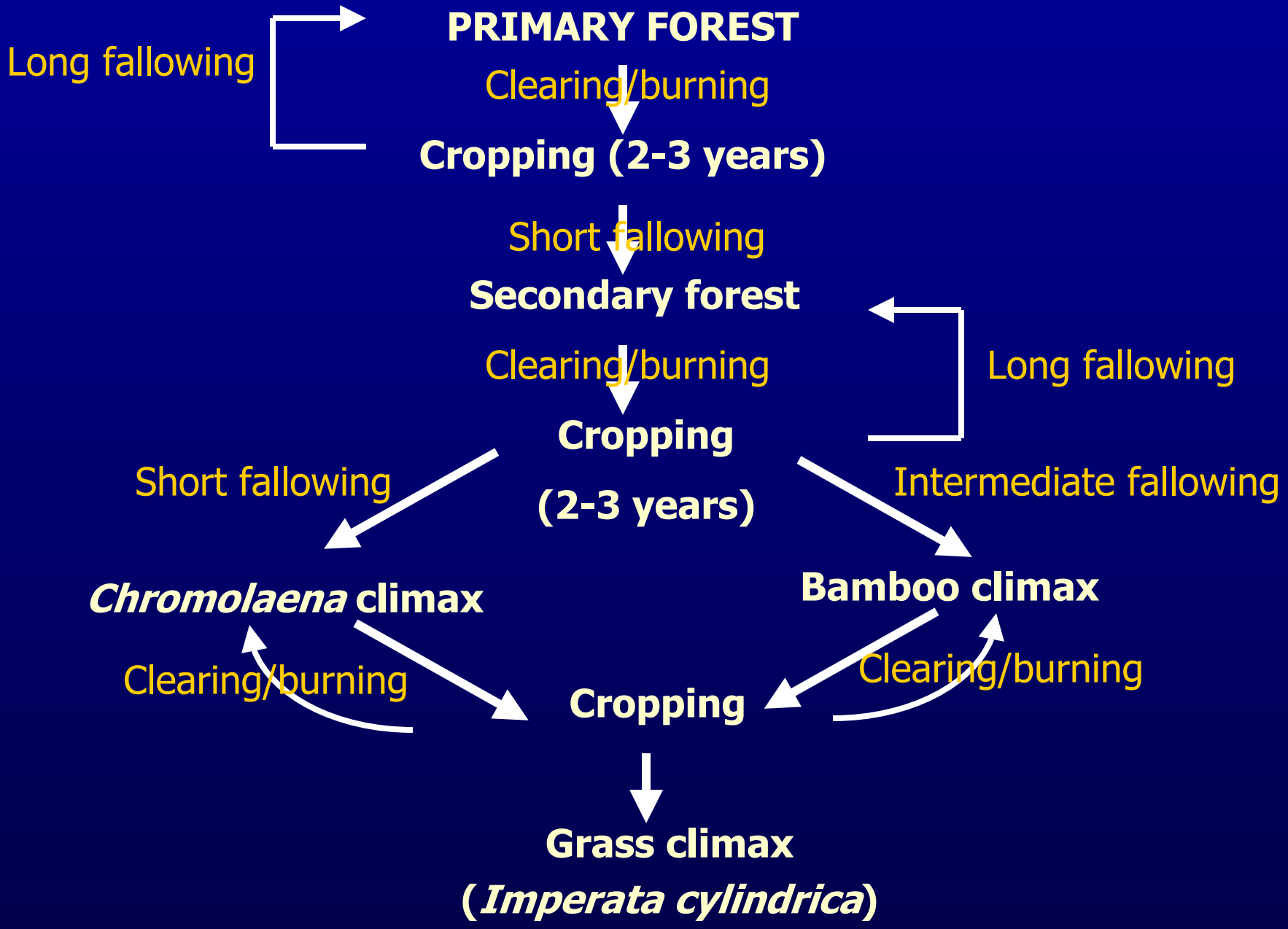
# Farmers' Management of Weed Succession

**Examples of some preferred weeds and grass climax**

| Weed Species | Growth Habit |
|---|---|
| ***Chromolaena odorata*** | Small shrubs |
| ***Euphatorium adenophorum*** | Small shurbs |
| ***Ageratum conyzoides*** | Herbaceous weed |
| ***Pennisutum pedicellatum*** | Grass weeds + inorganic fertilizers |
| ***Imperata cylindrica*** | Grass weeds + shed tree |

# Key points:

- Directional succession with deterioration trends
- Cyclical climax


Long fallowing
PRIMARY FOREST
Clearing/burning
Cropping (2-3 years)
Short fallowing
Secondary forest
Clearing/burning
Long fallowing
Cropping
(2-3 years)
Short fallowing
Intermediate fallowing
Chromolaena climax
Bamboo climax
Clearing/burning
Clearing/burning
Cropping
Grass climax
(Imperata cylindrica)

# Managed species: *Mimosa invisa*

- **Spinny leguminous plant**
- **Introduced species from lowland village nearby for fencing small native vegetable gardens**
- **Farmers observed beneficial effects in degraded land, expansion and management for intensive vegetable production**
  - **Wet season ground cover for high value vegetables in the (cool) dry season**
  - **Grown in association with local glutinous corn for seed production and soil improvement**
  - **Significant amount of atmospheric nitrogen fixed by *M. invisa***

| | |
|---|---|
| Wet season *Mimosa* mulch (no seed produced) | 67 kgN/ha |
| Grown in association with glutinous corn for seed rain for the next wet season | 47 kgN/ha |
| Total amount in Cabbage-G. Corn | 114 kgN/ha |

# **Secondary forest succession:** agrodiversity management of *Macaranga denticulata* in short fallow shifting cultivation

**Tee Cha** : A *Pwo Karen* in the border of Thailand and Myanmar in *Mae Hong son* province

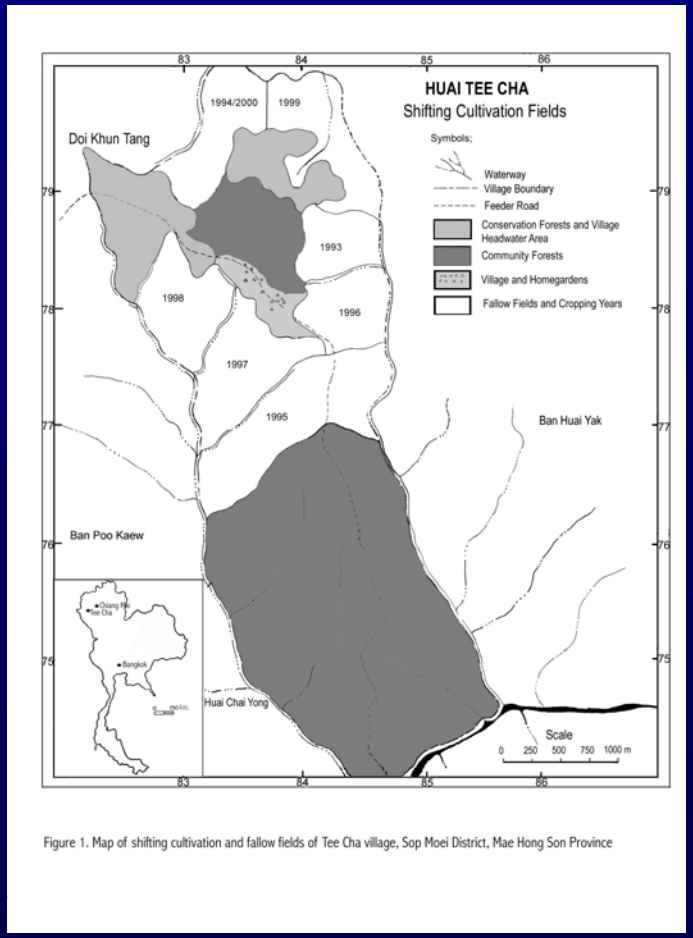



Figure 1. Map of shifting cultivation and fallow fields of Tee Cha village, Sop Moei District, Mae Hong Son Province

## **Managed fallow species**: *Macaranga denticultata*

- A well known pioneer shurb species of the tropical forests, e.g., early succession stage and aggresive gap filling species
- Prolific seed producing species
- Farmers' observed yield benefit from the area with high abundance of *Macaranga*
- With suitable "*microsite*" dense stand of *Macaranga* could be managed to sustain yields of upland rice for >15 years

# Number of species, plant numbers and derived diversity indices of different land use in *Tee Cha* village

| Forest Type | Numbers/Plot | | Derived Indices | | |
|---|---|---|---|---|---|
| | Species | Plants | Shannon-Weiner | Species Richness | Eveness |
| 6-year Fallow | 25 | 143 | 2.11 | 2.09 | 0.65 |
| Community Forest | 54 | 36 | 3.58 | 9.00 | 0.89 |
| Dipterocarpus Forest | 35 | 19 | 2.97 | 8.03 | 0.84 |
| Headwater Area | 37 | 15 | 3.09 | 9.35 | 0.85 |

# Conclusions

1. Pressures on land use

   Management of fallow in traditional shifting cultivation is no longer possible.

2. Alternative systems

   Improved production systems with introduced SWC measures

   - Farmers' innovations on species management of shorter fallow systems

3. PLEC activity

- Identifying and analysing agrodiversity management
- Analysing key process in management and conservation
- Demonstration the successes