Agrodiversity Lessons: Examples from the highlands of northern Thailand

29-30 October 2003, Elizabeth Rose Conference Hall
UNU House, Tokyo, Japan
Outline of Presentation

• Background
• PLEC Work in N. Thailand
• Agrodiversity lessons
• Conclusions
LAND FORMS IN NORTHERN THAILAND:

Area 170,000 sq.km

Upper part 89,500 sq.km
  - Lowlands 11.0 %
  - Uplands 39.2
  - Highlands 49.8

Population (persons)
  - Highlands 772,465
  - Lowlands 6.2 million
System in transition: Fragmentation of shifting cultivation
Traditional Shifting Cultivation

- Illicit opium poppy cultivation
- Government policy to eradicate the illicit cultivation of opium
- Promotion of alternative (cash) crops to replace opium
- Permanent settlement and fixed field cultivation of cash crops
PLEC Sites in Northern Thailand

4 sites selected in 1994
- Loh Pah Krai (*Lahu*)
- Pah Poo Chom (*Hmong Njua*)
- Mae Rid Pagae (*Skaw Karen*)
- Tee Cha (*Pwo Karen*)

2 sites in 1999-02
- Pah Poo Chom (Full demonstration)
- Tee Cha (Research)
MMSEA: Sub-regional linkage between N. Thailand and neighbouring countries

- Southwestern China
- Northern Myanmar
- Northern Thailand
- Northern Laos
- Vietnam

(Modified from Thomas 2000)
MMSEA –

People and Land Use

- Ethnic minority populations
- Last remaining forests in the region
  - Diversity in natural species and ecosystems
- Shifting cultivation
  - Diversity in agricultural species and land use types (over space and time)
- Tradition/history of opium production among some groups
MMSEA

- Pressures on the land

- Population growth, migration, encroachment from lowlands
- Arrival of market, promotion of cash cropping to replace opium
- Conservation policies: drastic reduction of area available for agriculture (shorter rotation cycle)
<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>Shifting cultivation (pioneer, rotational with 10-20 years rotation cycles); some wetland rice; largely subsistence (except for opium)</td>
</tr>
<tr>
<td>2000</td>
<td>Sedentary (no more pioneer); shorter rotation; more permanent cropping (tree crops; vegetables); increasing market integration; opium poppy replacement; wetland rice development where possible</td>
</tr>
</tbody>
</table>
Agricultural Landscape for Permanent Cash Crop Production in Lancang and Menglian, China
Cabbage: alternative crop for former pioneer shifting cultivators in northern Thailand
PLEC Site in Gaoligongshan, China
PLEC Work in Northern Thailand, 1999-2002
PLEC focuses on agrodiversity management and conservation of biodiversity of

1. Domesticated and semi-domesticated species

2. Wild species
Tee Cha

Traditional shifting cultivation with 7 years rotational cycle

• 6 years in fallow, and

• 1 year in upland rice

Narit Yimyam et. al. (2003)
Twenty plus kinds of crops sown with upland rice; others are planted before or after rice sowing.
Macaranga denticulata, a fallow enriching tree for acidic (pH 4) and infertile soil
Upland rice yield with *M. denticulata* at different densities and rotation cycles

<table>
<thead>
<tr>
<th>Pada density* (trees/10 m²)</th>
<th>4</th>
<th>1</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotation (years)</td>
<td>7</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Grain (t/ha)</td>
<td>2.57a</td>
<td>0.83b</td>
<td>0.74b</td>
</tr>
<tr>
<td>Straw (t/ha)</td>
<td>2.35a</td>
<td>0.97b</td>
<td>0.72c</td>
</tr>
</tbody>
</table>

*Before slash and burn

*Narit Ymyam et al. 2003*
Diversity of arbuscular mycorrhizal fungi
in the rhizosphere of *M. denticulata*

<table>
<thead>
<tr>
<th>Genus</th>
<th>Number of species found</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Acaulospora</em></td>
<td>6</td>
</tr>
<tr>
<td><em>Archaeospora</em></td>
<td>1</td>
</tr>
<tr>
<td><em>Gigaspora</em></td>
<td>2</td>
</tr>
<tr>
<td><em>Glomus</em></td>
<td>18</td>
</tr>
<tr>
<td><em>Paraglomus</em></td>
<td>1</td>
</tr>
<tr>
<td><em>Scutellospora</em></td>
<td>2</td>
</tr>
</tbody>
</table>

*G. multicaule*

*A. laevis*
Pah Poo Chom the Demonstration site in 1960-80

- Poverty
- Opium dependent
- High population of addicts
- Severe rice deficit
Working with community on participatory land use planning to resolve conflict and encourage biodiversity conservation
Working with households to conserve crop genetic resources
Agrodiversity Lesson 1:

• Edges are locally innovative sites for *in situ* conservation of wild, semi-domesticated and domesticated plant species but they are insignificant land use, say in comparison to cash crops. Establishing the importance of the edges, collecting relevant data and information for community sharing could lead to the implication for biodiversity conservation on a wider scale.
Agroforest Edges: the biodiverse systems for multiple functions (production, conservation and social service)
A complex AF edge managed by Mr. Saophang Saetao of Pah Poo Chom

- Highest species richness (114) vs. other edges (38)
- Highest utility (firewood, food, construction material and making tools)
- Conservation of headwater for production of cash crops
Reintroducing bambo for making *Hmong* pipe in AF edge, managed by Saophang Saetao of *Pah Poo Chom* village
Edges: systems for management and conservation of crops from
Harvesting local vegetables from the edge for cooking and sale to outside markets
Agrodiversity Lesson 2:

• Dynamisms of PLEC demonstration are recognized and used to facilitate and motivate local community and relevant development workers in the demonstration site.
Pah Poo Chom: Survey of Land Use and Monitor the Change

- Permanent plots for cash crops;
- Village headwater
- Community forests
Community Conflicts in Land Use: community forest encroachment for cash crop production
Conducted Survey of Agrodiversity Management and Field Measurement of Biodiversity in Different Land Use and Field Types

Management of *Mimosa invisa* for building
Strategies for Local Capacity Building and Community Organisation for Management and Conservation of Biodiversity

- Exchange of idea and information
- Evaluation of demonstration plots
- Training and cross visits to other communities
- Empowering expert farmers
- Field workshops and village meetings

Major Outcome: Village Committee for Forest Protection and Biodiversity Conservation
Agrodiversity Lesson 3:

• Mainstreaming the idea of PLEC, i.e., agrodiversity, involves active participation of local community and partners’ institutions
Revision of Village Land Use

Information inputs from PLEC demonstration activities
• Short series of field workshops and village meeting
  - Negotiation
  - Consensus and agreements
• Proposal development for local authorities, e.g., TAO, District Office, Local Forest Offices
  - Drafting village plan
  - Formal submission
• Concrete outputs
  - RFD funding for reforestation
  - Pilot site for national program on Farmers’ Field School
  - Development support from TAO
Conclusions

1. Appreciating, awaring and building on

- **Farmers’ innovations** (including farmers’ knowledge of spatial and temporal diversity of their biophysical environment and limitations, hybrid agroecosystems and others)

- **Community capacity in management and conservation of biodiversity**

- **Dynamisms of agricultural landscape**

- **Social and economic conditions for biodiversity conservation**
2. Approaching the demonstration and capacity building with

- The whole and significant parts of the demonstration site (village ecosystem in this case)
- The idea of interface between different land use types and stages in relation to agrodiversity management
- Active participation at all levels
Thank You