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Collaboration and Conflict – Developing Forest Restoration Techniques for Northern Thailand's Upper Watersheds Whilst Meeting the Needs of Science and Communities

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The Forest Restoration Research Unit FORRU-CMU
Founded in the Biology Department of Chiang Mai University, November 1994

To develop effective methods to restore indigenous forest ecosystems …

…for biodiversity conservation and environmental protection.

Our initial field trials were done in partnership with the village communities of the upper Mae Sa Valley, in Doi Suthep-Pui National Park, northern Thailand.

Stage 3 Degradation

Forest remnants <10 km from site

Insufficient sources of natural regeneration remain viable <3100/ha

Fire risk high

Small seed dispersers remain

Weeds Dominate

3 Main Restoration Tasks

Protection

Prevent fire and other disturbances.

+

ANR

Accelerated natural regeneration. TAKE CARE OF WHAT'S ALREADY THERE. Weeding + fertilizer for natural regenerants.

+

Plant Framework Tree Species

Plant minimum number of indigenous forest tree species for maximum ecosystem recovery.

Framework species method

Planting 20-30 indigenous forest tree species, which enhance natural forest regeneration

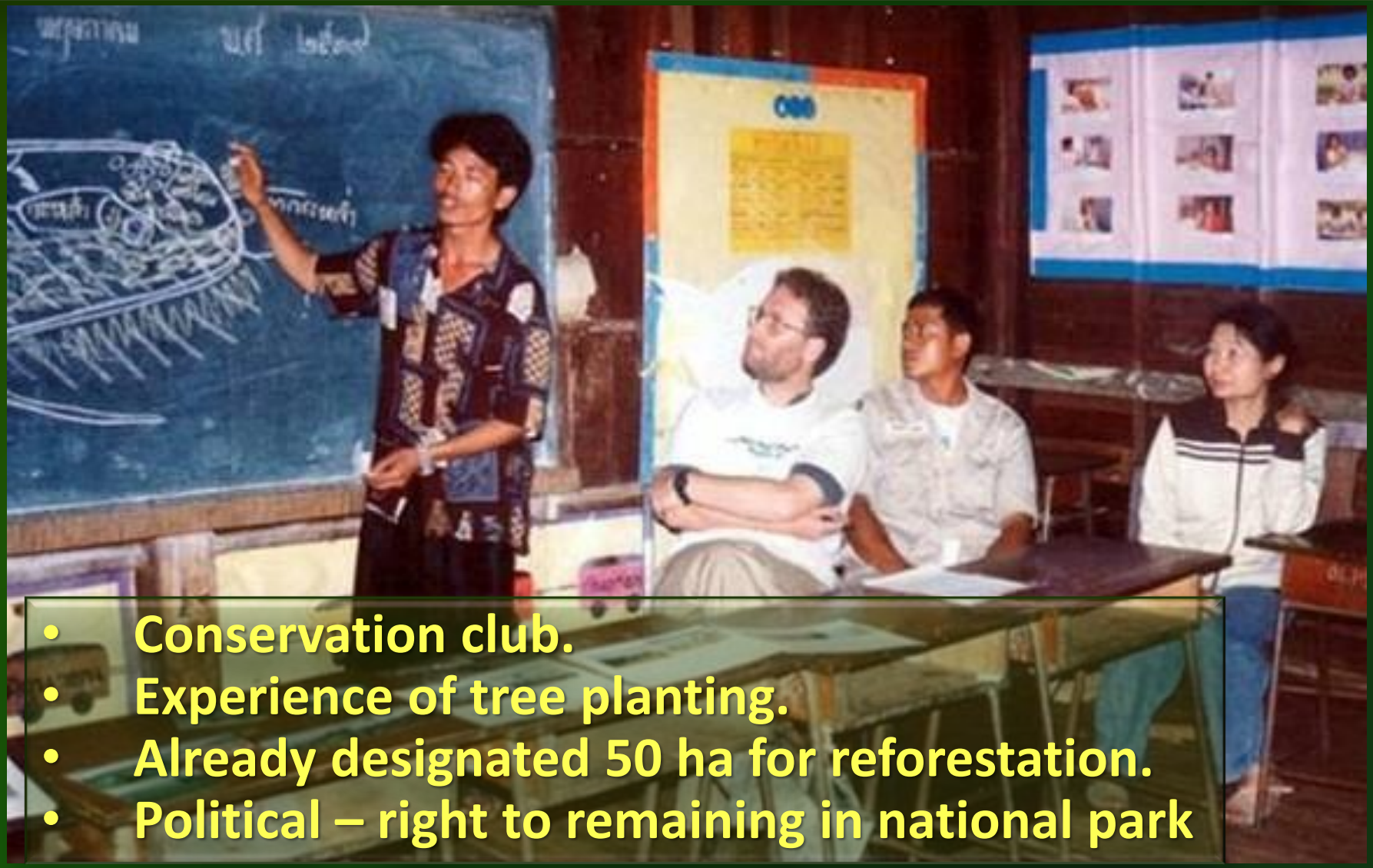
Search for and test forest tree species with:

- High survival, rapid growth
- Dense spreading crowns - shade out weeds
- Attract seed-dispersers with fruit, nectar etc.

Scientific Research

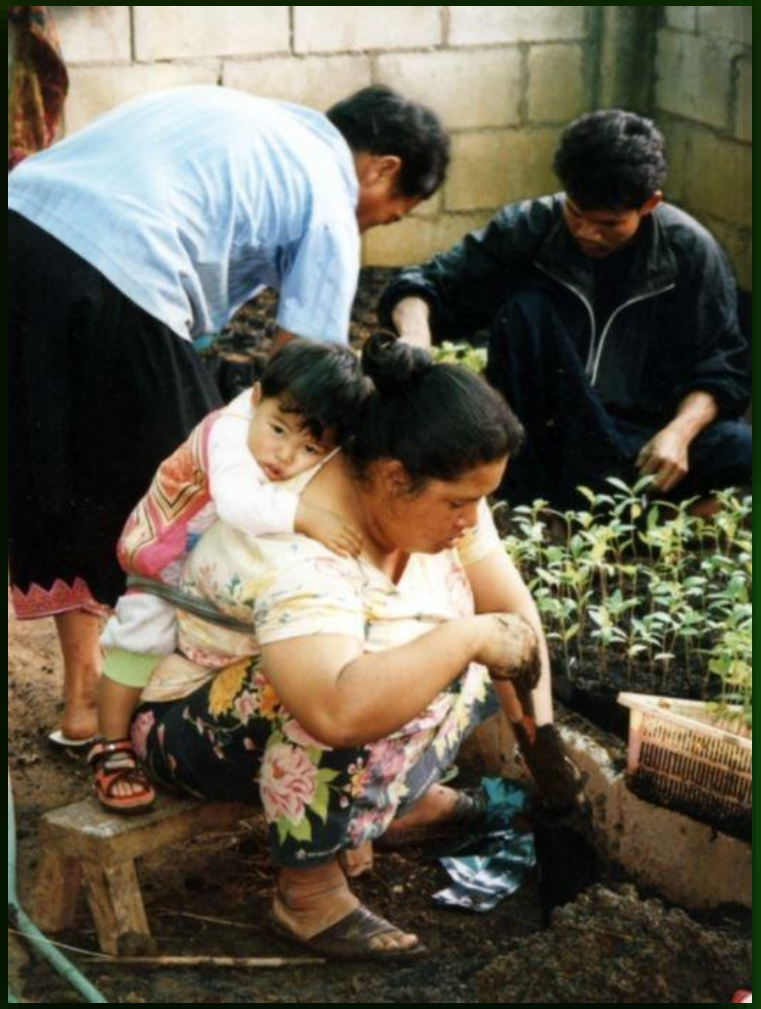
- Tree propagation (>470 species tested in the nursery)
- Field trials – compare species and silvicultural treatments
- Monitor biodiversity recovery and carbon storage

We worked with the villagers … from planning…



- Conservation club.
- Experience of tree planting.
- Already designated 50 ha for reforestation.
- Political – right to remaining in national park

…to growing the trees …



… in a community tree nursery, sponsored by FORRU-CMU


Tree planting

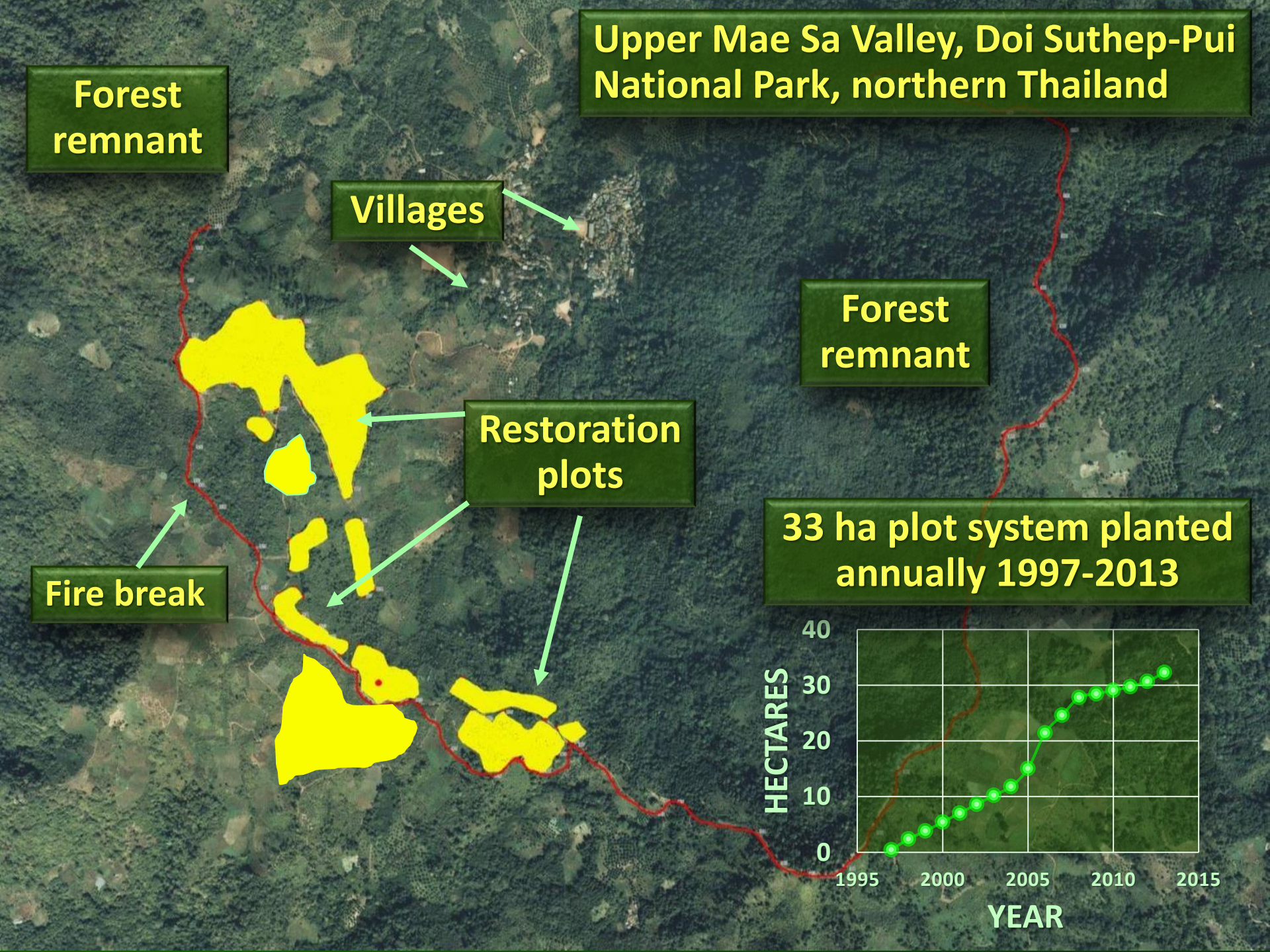
Caring for planted trees

Fire Prevention


… and finally monitoring success.

Inputs from the community

- Indigenous knowledge and local seed sources – species selection
- Local tree production nursery
- Test bed for the social acceptance of scientific methods
- Source of field labour


Upper Mae Sa Valley, Doi Suthep-Pui National Park, northern Thailand
Forest remnant
Villages
Forest remnant
Restoration plots
Fire break
33 ha plot system planted annually 1997-2013
HECTARES
40
30
20
10
0
1995
2000
2005
2010
2015
YEAR

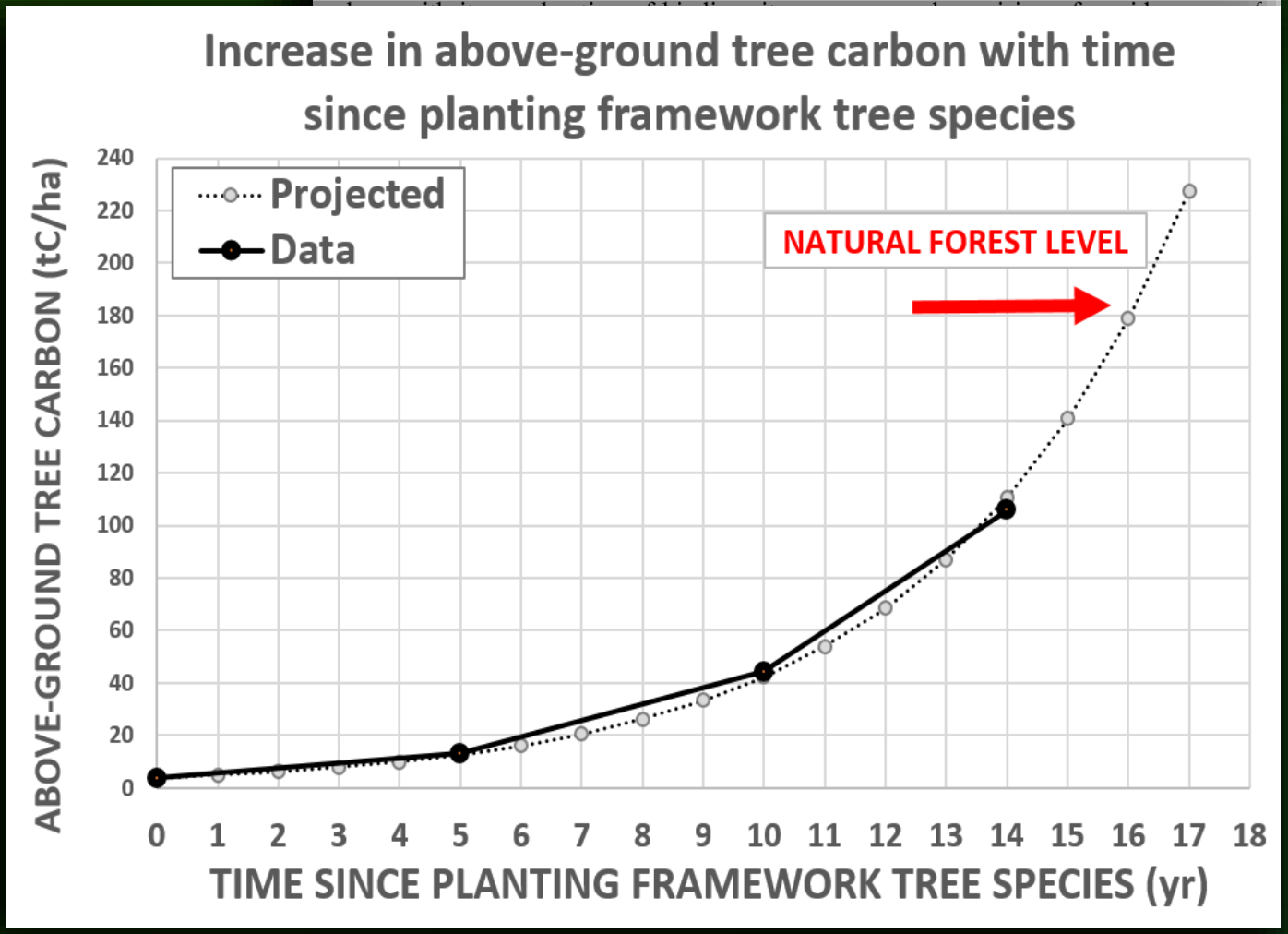
Project outcomes, impacts and monitoring


10 YEARS

Above-ground carbon sequestration during restoration of upland evergreen forest in northern Thailand

only 9.80 kgC/tree. An even framework species mix would sequester 13.2, 44.3 and 105.8 tC/ha, 5, 10 and 14 years respectively after planting and would achieve carbon storage levels similar to those of nearby natural forest in 16-17 years. The framework species method is therefore capable of rapidly accumulating carbon, a property which,

But potential benefits from carbon not being realized because there is no forest carbon trading system in place in Thailand.



BIODIVERSITY – rapid recovery

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Biodiversity Recovery after planting 29 FW tree species

- **Bird species richness increase from 34 to 88[1] in 6 years. 66% of forest bird species returned.**

[1] *Toktang*

ECOLOGICAL FUNCTIONING

Seedling dynamics – self sustained forest ecosystem

Planting 30 framework tree species fostered the recruitment of an additional (non-planted) 72 tree species within 8-9 years (Sinhaseni, 2008).

Aquilaria crassna

Project benefits perceived by villagers (structured interviews 2005-07)

Social Benefits

- "Improved public image" - strengthening their right to live a national park
- "Improved relationships" with local government and NGO's – attracting matching funds for social projects
- "Improved social harmony" - by reducing internal conflicts over resource shortages

Project benefits perceived by villagers (structured interviews 2005-07)

Environmental Benefits

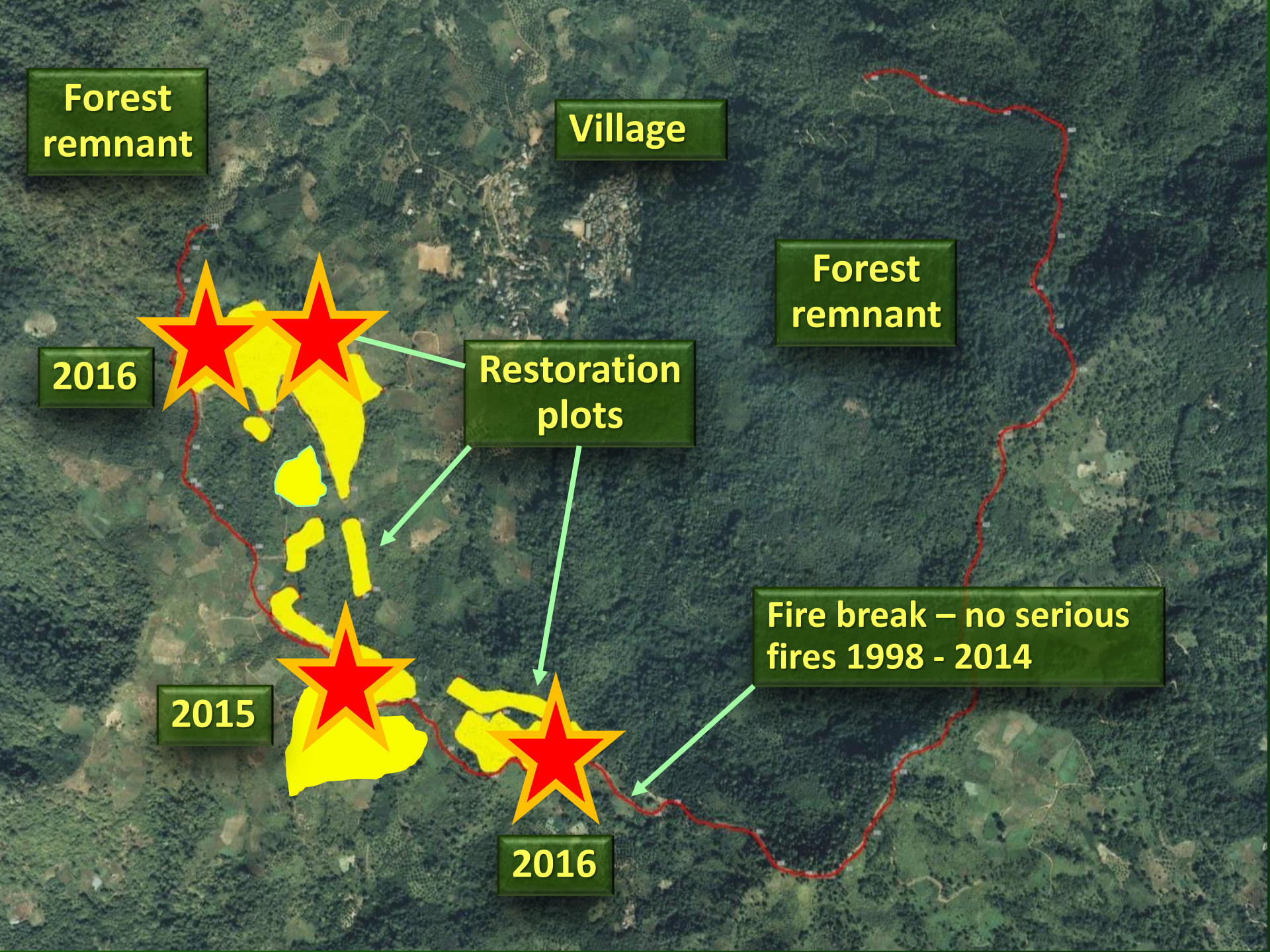
Improved water quality - more reliable supply of water in the dry season.

Project benefits perceived by villagers (structured interviews 2005-07)

Tangible Economic Benefits - Not highly valued!

- Payments from the project for labour etc.
- Non-timber forest products – estimated at US$ 20-314 per household per year.
- Ecotourism income – but benefit not shared equally across the village

Challenges & Critical reflections


Forest remnant
Village
Forest remnant
2016
Restoration plots
Fire break – no serious fires 1998 - 2014
2015
2016


12 YEARS

16 YEARS – 1 week after FIRE


17 YEARS – 1½ years after FIRE

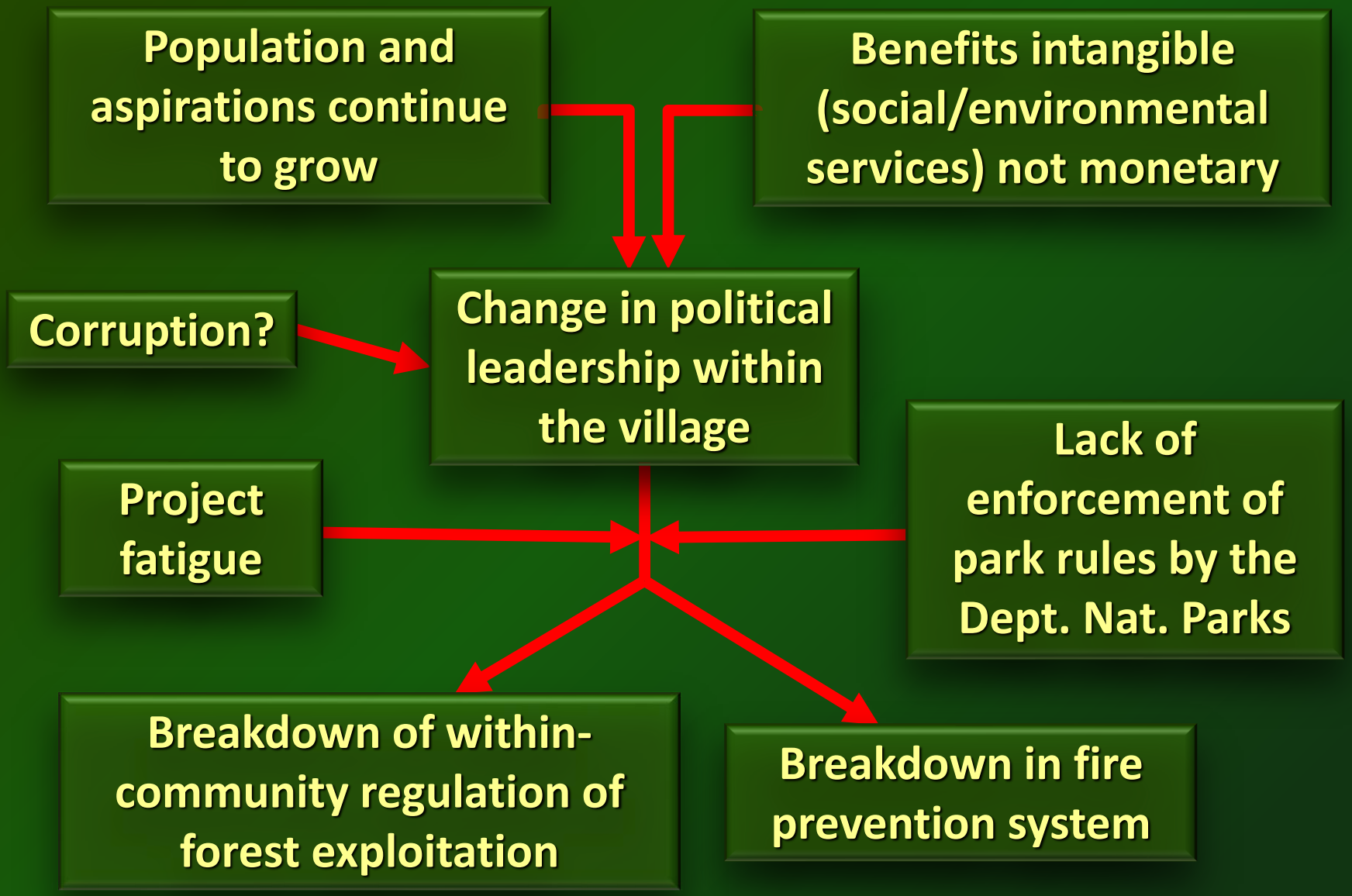
Encroachment – conversion back to agriculture (planted 2009)

… and yet the villagers continue to organize their own tree planting events.

2014 - 2016

… and in 2018, all 12 nearby Hmong communities pledged to eradicate fire in a public show of commitment.

Fluctuating Factors



Final thoughts …

- Science-community partnerships can result in FLR.
- Communities comprise dynamic political factions, each responding differently to changes in socio-economic-political circumstances.
- Intangible benefits cannot sustain FLR in the long term. Funding mechanisms based on the actual value of the restored forest ecosystems (PES? - carbon credits, watershed services or ecotourism) are needed.

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Thank you for listening

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