FOREST RESTORATION THROUGH AGROFORESTRY ACTION-RESEARCH AT THE GUNUNG WALAT EDUCATION FOREST, INDONESIA

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INTRODUCTION

- Gunung Walat Educational Forest (GWEF) at Sukabumi District, Indonesia established since 1973 by Faculty of Forestry, Bogor Agricultural University.
- About 350 ha forest area covered by very good vegetation dominated by Agathis (*Agathis lorantifolia*) and Pine (*Pinus merkusii*).
- 1997-2000 the GWEF faced a rapid degradation due to illegal cutting and encroachment by local people who were mostly landless and unemployed due to economic crisis.
- About 200 households encroached about 75 ha of the GWEF area, so difficult or even impossible to expel them from the forest area.
- To restore the forest area and improve the livelihood of the community surrounding the GWEF, an agroforestry action research project was the only possible promising solution.
- Supported by Korean Government through ASEAN-Korea Environemnetal Cooperation Project (AKEOP) for two project phases in 2001-2004 and 2005-2008, the forest restoration through agroforestry action research was then implemented in the GWEF

LOCATION OF THE GUNUNG WALAT EDUCATIONAL FOREST (GWEF)

ILLEGAL ACTIVITIES BY LOCAL PEOPLE AT GWEF

Why conserving and preventing further degradation of the GWEF was very important,

so that an agroforestry action research project was implemented at the Gunung Walat Educational Forest ?

IMPORTANCE OF THE GWEF FOR LOCAL PEOPLE

APPROACH TAKEN

- An action research using participatory approach through involving local people in the establishment of agroforestry system was applied and supported with various researches on biophysical as well as socio-economic aspects.
- PRINCIPLES:

a. The people living in and surrounding the forest must and need to be concerned in developing forestry sector in Indonesia, because they are integrated part of forest ecosystem, most of them deserve justice after being neglected and set aside for long time, have shown big power which could seriously destructive if being ignored and could be supportive if given enough concern (Darusman, 2000),

b. The change of forestry paradigm from protecting the forest from community to involving community in forest management (van Gelder and O'Keefe , 1995),

c. The conceptual changes needed in the forestry management into forest management based on partnership and participation (Campbell, 1997)

APPROACH (CONT.)

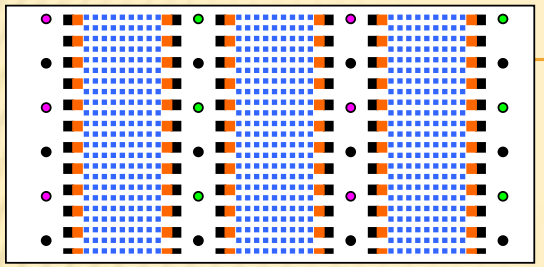
- Establishment of agroforestry at forest area was not a new concept in Indonesia. The Dutch started it in the beginning of 19's century for teak forest establishment in Java and continue until now by Perhutani (State Forest Enterprise).
- What was new then in the project?

a. Trees and crops planted at agroforestry system in the GWEF were selected according to the local people preference instead of decided by forest manager, i.e. sengon (*Paraserianthes falcataria*) and already existing *Agathis loratifolia* as trees component and coffee (*Coffea robusta*), banana, cassava, cardamom as agriculture crops component

b. The local people were allowed to manage the agroforestry plots for 10 years (only 2 year in Perhutani, at that time) with possible extension under agreement between farmers and the management of GWEF.

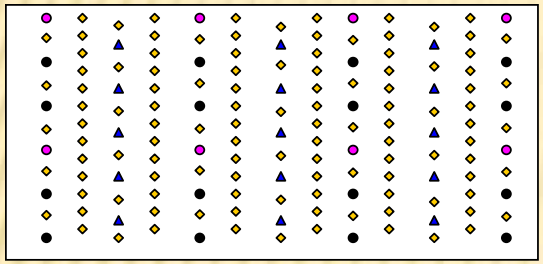
c. Training and extension for farmers on agroforestry management were conducted to improve their capability.

AGROFORESTRY DESIGN



- *Agathis dammara* (50 x 10 m)
- *Paraserianthes falcataria* (50 x 10 m)
- Banana
- Pineaple
- Chili
- Rice/Corn/Peanuts

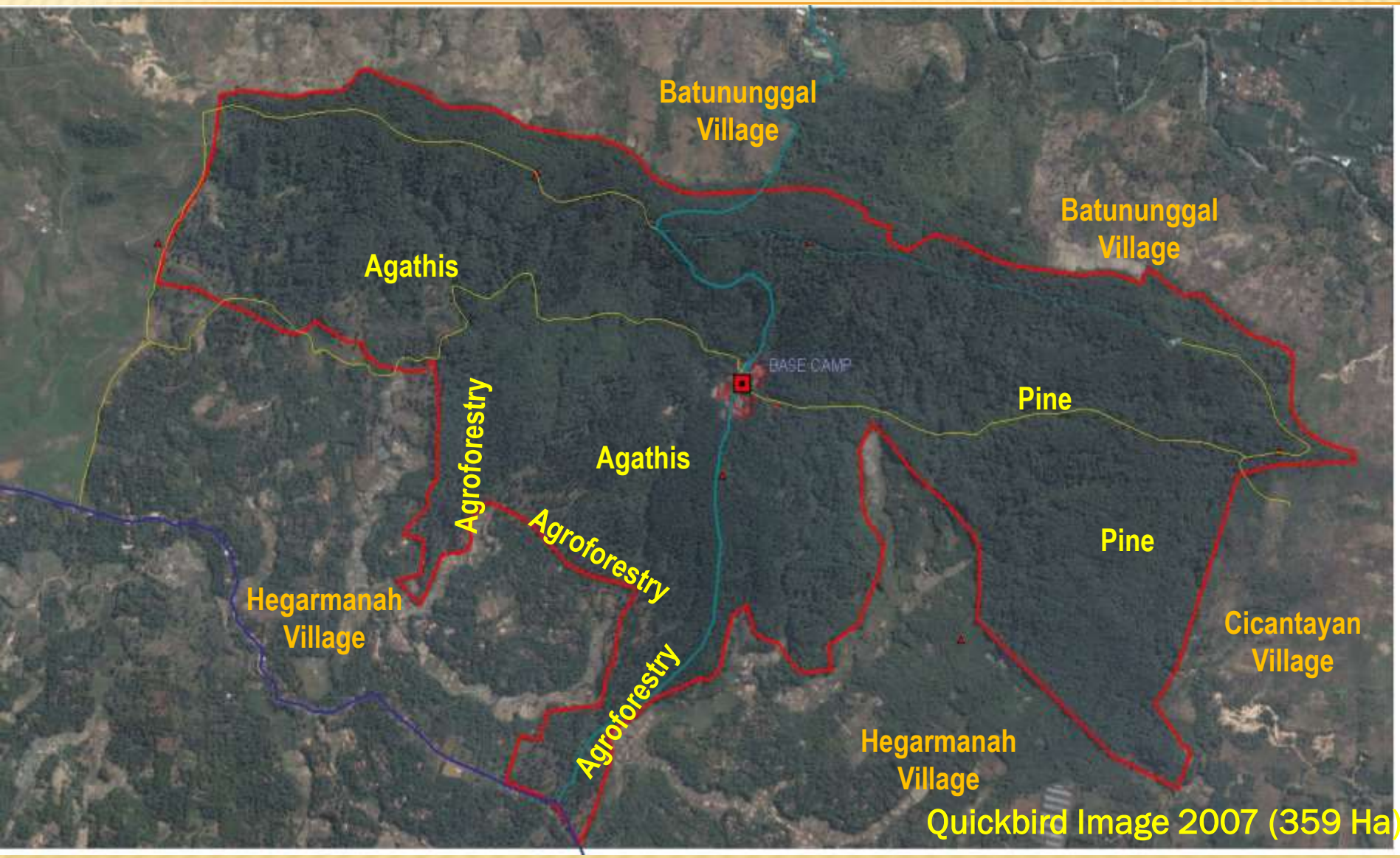
Figure 2 : First and Second Design of Agroforestry System



- *Agathis dammara*
- Banana
- Cardamon
- Coffea

Figure 3 : Third Design of Agroforestry System

PROJECT LOCATION AT GUNUNG WALAT EDUCATIONAL FOREST



CAPACITY BUILDING OF FARMERS AT GWEF

IMPROVEMENT OF AGORORESTRY PRODUCT PROCESSING

SUPPORTING RESEARCH

- Study about marketing of agroforestry products from research site
- Analysis of income contribution and labor allocation in agroforestry
- Study about socio economical condition of people surrounding the GWEF
- Study on the factors affecting farmer's participation in forest rehabilitation project
- Study about diversity of mycorrhiza at agroforestry area
- Study about diversity of plant species in the garden of local people
- Study about seed yield of *Agathis loranthifolia* in agroforestry stand
- Study on diversity of pest sand diseases commonly found in the agroforestry system
- Study on the vertical and horizontal space allocation of intensive and less intensive agroforestry systems in relation to yields
- Techniques to produce and inoculate mycorrhiza in the field
- Study of erosion in several agroforestry sites with respect to slopes variation and vegetation composition

SUPPORTING RESEARCH

INTENSIVE TREATMENT OF AGROFORESTRY

RESULT AND IMPACT

1. RESTORATION OF FOREST AREA

1. Establishment of agroforestry has gradually restored and prevented further disturbance of the forest area in GWEF. There was no further illegal cutting and encroachment activity in the GWEF
2. Agroforestry combined trees and agriculture crops, so that could provide food and cash for the people and in the same time restore the forest ecosystem.
3. The farmers could harvest the food crops but not allowed to cut Agathis as the main tree component. Although that they get income from tapping resin from Agathis.
4. Tree species which could produce non timber products (resin, fruit, etc.) such as Agathis is very suitable to use in agroforestry project with multiple objectives

2. IMPROVEMENT OF COMMUNITY LIVELIHOOD

- Agroforestry in GWEF has contributed to household cash income and given a certain level of staple food security to the farmers.
- Agroforestry contributed about 10% until 20% to the household cash income, because the average agroforestry plot per farmer was very small, only about 0.16 ha.
- Although that the farmers worked in the agroforestry plots only in their spare time, so that the agroforestry was not the main income sources but an additional income that very important for the poor people especially during the hard times.

3. INCREASING OF BIODIVERSITY

Non-Agroforestry	Agroforestry
Trees: Damar (*Agathis lorantifolia*) Pine (*Pinus merkusi*i) Puspa (*Schiima walichii)*	**Trees:** Damar (*Agathis lorantifolia*) Pine (*Pinus merkusii*) Puspa (*Schiima walichii)* Sengon (*Paraserianthes falcataria*) Mahagoni (*Swietenia macrophylla)*
Agriculture crops: None	**Agriculture crops:** Cardamom (*Amomum cardamomum*) Taro (*Colocasia esculentum*) Cassava (*Manihot esculenta*) Coffee (*Coffea robusta*) Banana (*Musa* sp.)
Other plants: non economic valuable shrubs and tubers	**Other plants:** non economic valuable shrubs and tubers

Source: AKECOP Annual Report 2005

AGRICULTURE CROPS AND PRODUCTS OF AGROFORETSRY IN GWEF

Agriculture crops:
Banana,
Coffee,
Cardamom,
Cassava

Agroforestry
products
from GWEF

4. SECURING TENURIAL SYSTEM

- Agroforestry project at the GWE involving local people has practically legalize the illegal cultivation activities conducted by local people.
- Through the project then the people recognize and admit that the land still belong to the state
- Securing the tenurial system has been conducted through a longer period of contractual agreement with local people and a better sharing of benefits
- The farmers as the project participants were allowed to cultivate the forest land according to the planned agroforestry design for about 10 years.
- The farmers were secured to get all the agricultural crops, with 50 % of wood volume from *Paraserianthes falcataria* and resin from *Agathis loranthifolia*

5. PEOPLE'S INTEREST AND PARTICIPATION

- People's interests were the concern of the project
- Through Participatory Rural Appraisal (PRA) and regular meetings, the interest of local people, including their preference of plant species were discussed.
- The time opportunity cost of the people invited in the meeting, training, trip, extension, as well as in certain forest works was valued, because they were mostly very needy people.
- Participation of the local people in the project was very important to ensure the success of the project.

MAINTAINING PEOPLE'S INTEREST AND PARTICIPATION

6. GENERATION OF KNOWLEDGE

- Reports of research projects
- Students thesis on agroforestry
- Publications of research results

ACKNOWLEDGMENT

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THANK YOU
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