

Wanagama



From Bare Land To Forest

**LESSONS LEARNT:
CONVERTING ENVIRONMENTALLY
FRAGILE AREAS INTO
WANAGAMA TEACHING FOREST**



**WANAGAMA
FACULTY OF FORESTRY
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LESSONS LEARNT : CONVERTING ENVIRONMENTALLY FRAGILE AREAS INTO WANAGAMA TEACHING FOREST

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Introduction

Wanagama Forest is a Teaching Forest managed by the Faculty of Forestry, Universitas Gadjah Mada, Yogyakarta. It is located in Gunung Kidul District, Yogyakarta Special Province about 40 km in the southern part of the UGM Campus. Wanagama Teaching Forest was established in 1964 from a bare land with the total area of 600 ha. It is a representative of semi-arid area, indicated by average rain fall of 1,900 mm/year with 2-6 dry-months (<60 mm/month) and 80 days rainfall/year. It gives serious effect on water availability in that area especially in dry season.

This forest has become a good example on how a power of spirit plays important roles in converting environmentally fragile bare land area and poor local people into a real forest with green vegetations and more prosperous local communities.

The Objective

Wanagama Teaching Forest establishment has been dedicated for:

- Find out the pattern of forest rehabilitation in the critical area and establishment of multi purpose forest
- Establish the education center for students, community and field praticions
- Preparing research facilities for Faculty of Forestry staffs to identify problems related to critical area rehabilitation
- A training center to increase skill and knowledge for local communities, students and teachers, government officers, private sectors in the field of forest rehabilitation, forest productivity, and soil, water and environment preservation
- A place for transfer of research finding, knowledge and technology from Faculty of Forestry UGM to the private and government institutions, social and non-government organization and others.

Gunung Kidul district in the 60's era was known as a critical area. This critical condition was not only related to soil and environment aspects but also in social and economic aspects of the community. In the Dutch colonial period up to 1940's, forest area in the Gunung Kidul District was dominated by climax teak forests. Afterwards, the forest condition declined sharply, especially in the Japanese occupation period in 1942-1945. This condition continued to decline even after Indonesian become independent in 1945, and finally, when a conflict of communist party happened in 1965, the teak forest has really gone from Gunung Kidul District.

This condition led to the formation of a large number of critical areas. The process has been encouraged by heavy soil erosions due to a mountainous topography accompanied by heavy rainfalls in wet season and hot temperatures in dry season. Those factors have detrimental effect on soil conditions. It did not just converting fertile soil to become infertile but also eroding soils leaving the area with only scarce soils between rocks. In fact, this condition occurred in many area in Indonesia, especially in the eastern part of Indonesia.

At that time, almost all people leaving in the surrounding forest area worked as farmers with very limited agricultural lands. Therefore they were depended on the forest land for producing their daily need such as cassava, rice, corn and peanuts. The people are also depended on the forest for obtaining fodder for their cattle, fire wood for cooking, and wood for housing. In the same time, the number of population in the area were increasing. All these factors caused forest rehabilitation programs which were conducted in the Gunung Kidul District were really difficult to be realized.

Actually, all mentioned phenomena have become a big challenge for UGM foresters to find out the way to solve the problem. In line with that issue, the UGM foresters wanted to establish a forest station where all lectures and reseachers could, not only share their thinks and ideas, but also possible to realize those into practical works in the field. Therefore, Wanagama Teaching Forest was established by Faculty of Forestry UGM in 10 ha forest area onwed by Forestry Services of Yogyakarta Special Region. In 1968, the size was increased to become 79.9 ha covering the whole area of the compartment 5. Finally in 1983, Wanagama was enlarged to become 600 ha.

After more than 40 years, the environmental condition of Wanagama has totally changed. Almost all of the area have been covered by trees which favoring the development of the soils from limestone parent rock materials. Cool and fresh environment have been created, many water springs became available and many kinds of birds could be detected. Eventhough until at present, the condition of climax forest in Wanagama has not been achieved yet, a monumental work which give spirit to improve the environment have been done by UGM foresters. Wanagama is an example of a spirit and struggle of dedicated Foresters.

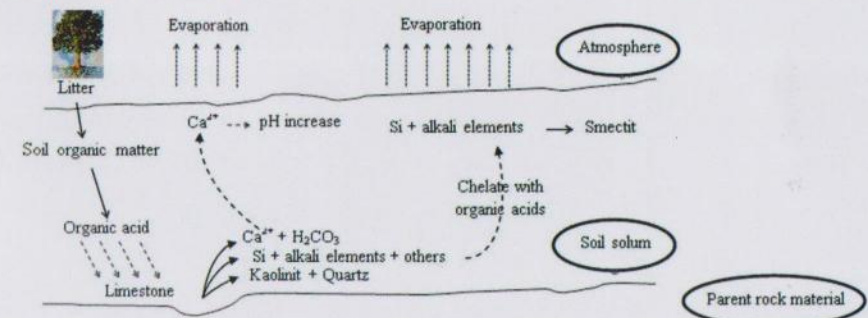
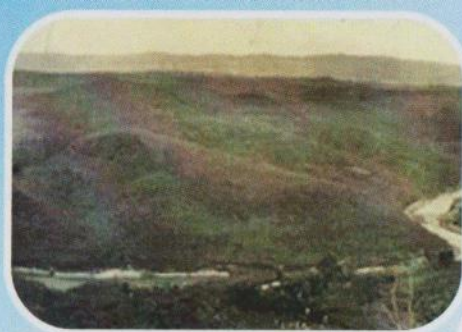
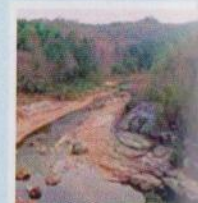
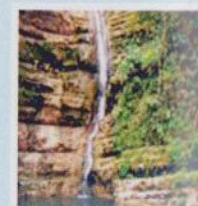


Fig 1. Schematic diagram of smectit formation from weathering of limestone parent rock materials



Soil Development
in Wanagama Teaching Forest



Wanagama
for Edu-Ecotourism Objects



**Better environments
for a better life**

To create and to establish
a Teaching Forest through
Smart Work Spirit
Hard Work Spirit
Total Work Spirit
Sincere Spirit

Based on the spirit and experiences in converting environmentally fragile area to Wanagama Teaching Forest, the Faculty of Forestry, Universitas Gadjah Mada has developed and implemented a silviculture method named Intensive Silviculture (SILIN) Method which aims to increase forest productivity. This method consists of several aspects namely genetically improve planting material (breeding and tree improvement), environmental manipulation and integrated pest management. SILIN method has been applied to several tree species, one of them is teak, in both research scales and also operational scales.

The Intensive Silviculture Method on Teak

Teak (*Tectona grandis* L.f) is one of the most important tropical timber species due to its reputation in high quality timber. It grows naturally, though discontinuously, in deciduous forests in central and southern India, Myanmar, northern Thailand and Laos, ranged from sea level to 800 m and in exceptional cases up to 1300 m above sea level (Monteuuis, 1994). It has been introduced to many southeast Asian countries such as Indonesia (especially Java about 400-600 years ago), Sri Langka, Vietnam and the Solomon islands.

In Indonesia, teak has been regenerated artificially in Java. It is planted in the community forestry areas which are covering more than 1.5 millions ha. Teak is a species in Indonesia where tree improvement work was carried out for the first time and it initiated by establishing international provenance trials on several sites in Java in 1932. However, since the Japanese occupation and independent war periods, these genetic studies had been neglected until 1980s. The main objective of teak improvement program was to produce genetically improved seed through establishing both clonal and seedling seed orchards (CSOs and SSOs).

Beside these orchards, in 1997 Faculty of Forestry UGM in collaboration with Perum Perhutani State Owned Company have initiated the establishment of hedge orchards of selected clones based on clonal tests. It has been established in several locations to produce good cutting materials, as fundament resources for clonal forestry. By these vegetative materials (cuttings), the clonal forestry in teak could be implemented in operational scale. The commercial name of the developed teak In Wanagama Teaching Forest then has been called Jati Mega Wanagama.



Fig. 2. Converting a fragile areas becoming a better environment

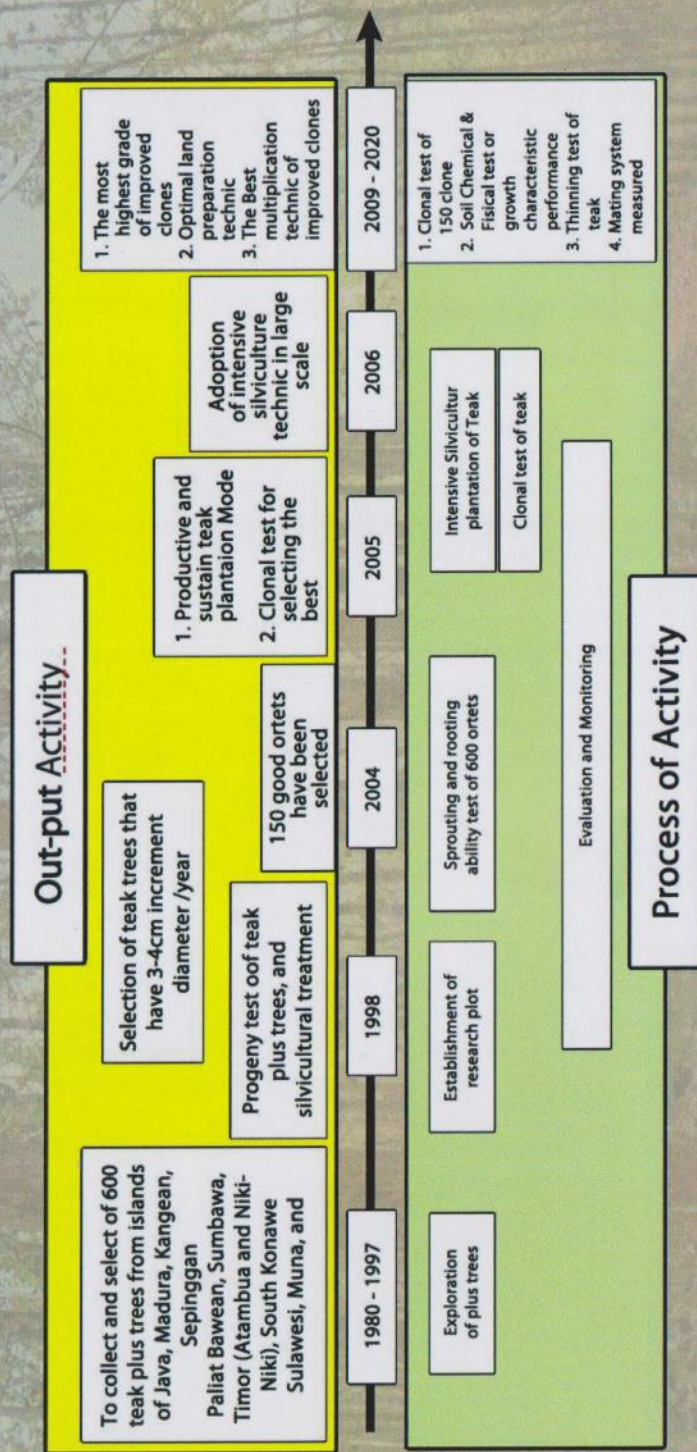
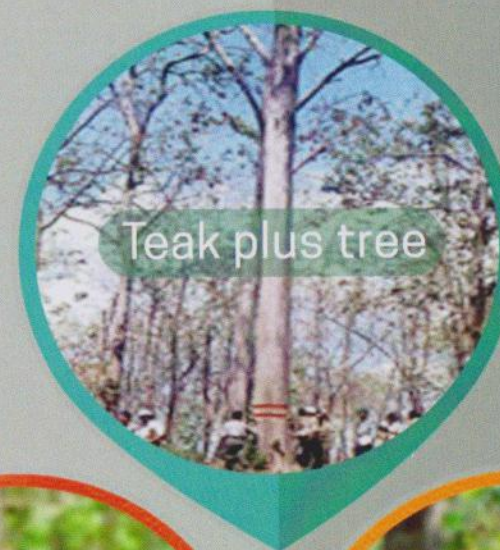
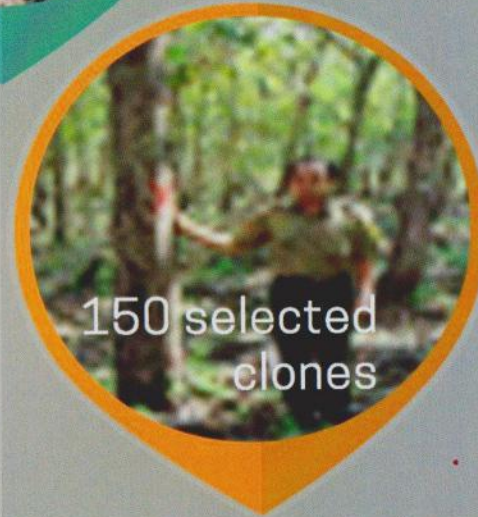
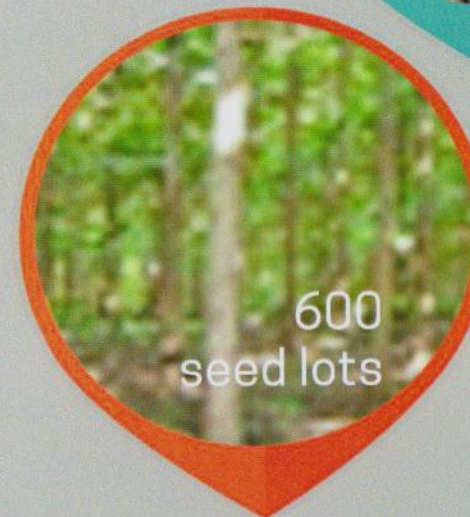


Fig 3. Road Map of Breeding Activity on Teak

TEAK IMPROVEMENT PROGRAM STARTED SINCE 1997 (Based on 600 Selected Mother Trees)



[illegible]

Table 2. Cost analysis of Clonal Plantation Establishment per Hectar for 20 Years Cutting Rotation

[illegible]

WOOD QUALITY TEAK



Jenis Jati	Kelas Awet	Kelas Kuat	Persentase Teras
JPP Cepu (7 thn)	III – V	III	31,61
JPP Cepu (5 thn)	III – V	III	26,07
Biji Ngawi (15 th)	III – V	III	27,99
Biji Ngawi (35 th)	I - II	II	71,99

Petak 49a, KPH Pemalang (umur 12 tahun)

Formation of heart wood is good, the percentage of heart wood to total diameter in the zone close to basal almost 80%

(Lab. THH FKT UGM, 2015)

Sumber: Puslitbang Perhutani 2016

Fig.4. The effect of thinning in several ages of clone teak on its wood quality

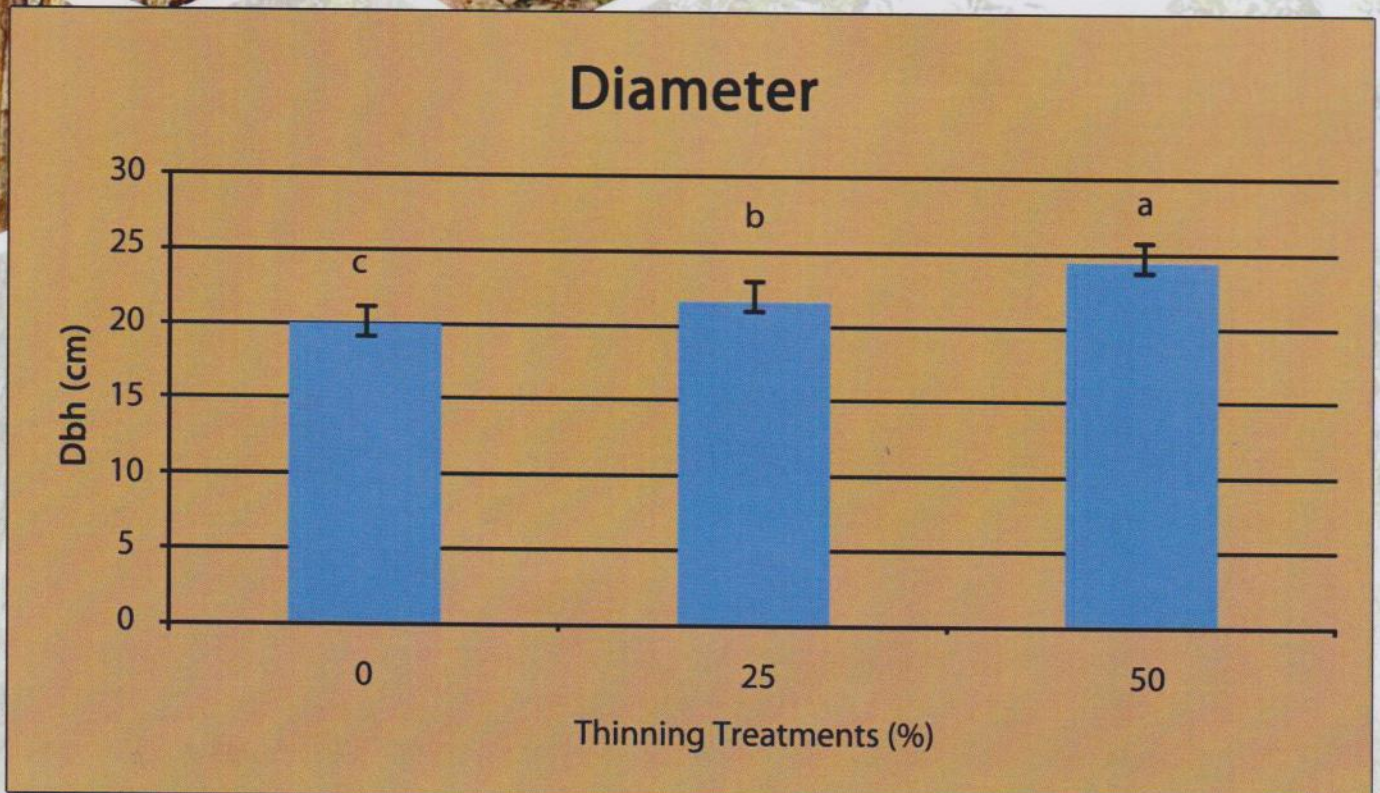


Fig. 5. The effect of thinning intensity to diameter variation of Mega



Fig. 6. The 12th years old performance of Mega Teak in Wanagama

