

# Management Plan of Gunung Walat Educational Forest.

Third Semester Project “Development of a Forest Region” of the MSc programme  
“Tropical and International Forestry” of the Georg-August-Universität Göttingen,  
in cooperation with the Bogor Agricultural University (IPB)

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Resin Tappers: *Pak Achep, Gelly, Pak Aauk*

## EXECUTIVE SUMMARY

This mid-term Forest Management Plan (FMP) is prepared as a guide on forest management in Gunung Walat Educational Forest (GWEF) in Sukabumi district, West Java, Indonesia. The plan is put together by the students pursuing their masteral program on “Tropical and International Forestry” at the Georg August University Goettingen in cooperation with the Faculty of Forestry of Bogor Agricultural University (IPB). The GWEF FMP is divided into 3 chapters. Chapter I describes the context at the landscape scale and stand characteristics. Chapter II is the working plan for 10 years taking into consideration two scenarios, (1) with zero cutting policy and (2) with timber production. Lastly, Chapter III is the Financial Plan with emphasis on the profitability of GWEF and a comparative economic analysis of the two scenarios.

GWEF is a 359-ha forest managed by IPB intended as “Educational and Training Forest.” Located at 7° S, it has an equatorial climate with a mean rainfall of 2400 mm per year and the soils identified are of latosols and podzol type. Currently, GWEF has 95% forest cover, comprising at least 44 species of plants including 2 species of rattan, 13 species of bamboo, 68 medicinal plants, agroforestry species, wild fauna and 52 species of birds coming from 22 families including the rare Javan eagle. GWEF is surrounded by three major villages: Hegarmanah, Batununggal and Cicantayan. Resin tappers are mostly coming from Hegarmanah and Cicantayan hired as employees but with no adequate health and safety measures at work. Potential conflicts revolve around competing interests in timber production, nature conservation, agroforestry, NTFP (Non-timber Forest Products) collection, recreation, carbon storage, and watershed management.

Of the 359-ha area of GWEF, only 195-ha is the focus of the FMP, inventoried through systematic sampling with the first random point (31 sample plots) on the eastern part of the area. The five forest formations comprised the five strata but only *P. merkusii* and *A. loranthifolia* stands were considered in this FMP. Based on qualitative and quantitative data, annual allowable cuts for the two designated production areas have been developed together with their corresponding silvicultural treatment suitable for sustainable forest management.

For the *P. merkusii* stand, the harvesting of target diameters and moderate thinning from below have been proposed with an annual allowable cut of 9 m<sup>3</sup>/ha/a. Enrichment planting with *A.*

*loranthifolia* is recommended as well. For the production area of *A. loranthifolia*, the harvesting of target diameters and moderate thinning from above have been proposed to generate income and ensure natural regeneration with an annual allowable cut of 15m<sup>3</sup>/ha/a. Other recommendations include the continuation of zero cutting policy in the agroforestry area with sustainable tapping of resins, proper site selection for *A. loranthifolia* plantation and its regular thinning to prevent sporadic death by fungi, regular monitoring and timely control of damage to *P. merkusii* (oversized resin tapping wounds), regular mapping and monitoring of the encroachment area, seed collection, production of planting stock in the greenhouse and in a private nursery, and the mapping of individual plus and mother trees for easier monitoring and seed sourcing.

To develop effective nature conservation actions, a preliminary assessment of the forest functions was organized to delineate the forest management zones in full consideration of the ecological, economic and social functions of GWEF. Using GIS techniques, management zones were identified the production, protection and recreation areas. Protection forest is the dominant use having an allocation of 123.3 ha or 63% of the total area. Production area has 71.7 ha or 37% of the total area while 44 ha are allocated for agroforestry models.

Forest utilization, infrastructure and harvesting were given due consideration. Infrastructure includes establishment and maintenance of roads for transport of forest products. In GWEF, timber harvesting is done mainly by chain saw and transported manually to the forest road. It is proposed that supplied timber will be transported from the forest roads by buyers themselves. Timber buyers are the operators of small saw mills in the villages nearby.

Wood produced will be classified into firewood, medium quality and high quality logs. It is recommended that the first two will be sold at the local market, whereas the latter will achieve highest revenues if sold at the regional market. Estimation for resin production per year from pure *A. loranthifolia* stands is 13 tons and from pure *P. merkusii* stands 70 tons. The basic price used for financial analysis of resin production is Rp 7,250/kg for the former and Rp 5,000/kg for the latter. The NPV of resin production in the status quo scenario with a discount rate of 4% in 10 years is Rp 724.545.895. It has been shown that the implementation of silvicultural treatments and harvesting could increase the NPV to Rp 2.283.333.331. The effect of silvicultural activities on resin tapping could be a decrease of 9% of income.

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### List of Abbreviations

AAC	<i>Annual Allowable Cut</i>
ASL	<i>Above Sea Level</i>
BCR	<i>Benefit-Cost-Ratio</i>
CAI	<i>Current Annual Increment</i>
DBH	<i>Diameter at breast height</i>
DBHi	<i>Diameter (at breast height) class i</i>
ENSO	<i>El Niño Southern Oscillation</i>
FAO	<i>Food and Agriculture Organization of the United Nations</i>
FMP	<i>Forest Management Plan</i>
FRA	<i>Forest Resources Assessment</i>
GWEF	<i>Gunung Walat Educational Forest</i>
H	<i>Height</i>
ILO	<i>International Labour Organisation</i>
IPB	<i>Faculty of Forestry of the Bogor Agricultural University</i>
ISS	<i>Identified Seed Stands</i>
ITCZ	<i>Intertropical Convergence Zone</i>
JICA	<i>Japan International Cooperate Agency</i>
MAI	<i>Mean annual increment</i>
MASL	<i>Meters above sea level</i>
NPK	<i>Nitrogen, Phosphorus and Potassium Fertilizer</i>
NPV	<i>Net Present Value</i>
NPV	<i>Net Present Value</i>
NTFP	<i>Non Timber Forest Product</i>
RandD	<i>Research and Development</i>
RIL	<i>Reduced Impact Logging</i>
RP	<i>Rupiah</i>
SFD	<i>Sukabumi Forestry Department</i>
SPA	<i>Seed Production Area</i>
SQ	<i>Status Quo</i>
Vi	<i>Tree volume in dbh class i</i>

## Introduction

Gunung Walat Education Forest (GWEF) was established in 1950 and the Faculty of Forestry of the Bogor Agricultural University (IPB) directs it since 1970. At the present it is being used for educational purpose, environmental services generating public benefits.

GWEF is located 56 km south from Bogor city, between 6°53'35"-6°55'10" S and 106°47'50"-106°51'30" E, and the topography is mountainous ranging from steep (15-25%) to very steep slopes (> 40%).

Starting almost with bare land this forest has become very diverse, dominated by planted trees such as *Agathis loranthifolia*, *Pinus merkusii*, *Swietenia macrophylla*, *Dalbergia latifolia*, *Schima wallichii*, *Gliricidae sp*, *Altingia excelsa*, *Paraserianthes falcataria*, *Shorea sp*, and *Acacia mangium*. (Source: <http://fahutan.ipb.ac.id/general-condition-walat-education-forest>)

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## **Framework**

The overall objective of this management plan is to provide reliable information in order to manage the forest in a sustainable way. The forest is managed according to the goal that it generates profits and services to fulfil the needs of people today as well as those of future generations on the same or even improved level. This objective is the baseline for the planning period of the next ten years as well as the long-term goal for Gunung Walat.

Sustainability of forest management can be achieved and defined in three dimensions and shall be explained by: (1) ecologically, economically and socially responsible, (2) All three dimensions are crucial for an overall sustainability and (3) To achieve sustainability in the long term, actions within the 10 years planning period need to be subordinated under the following standards.

**1. Ecological sustainability shall be achieved by enclosing the following standards:**

- 1.1 Soil protection and hence choice of site-matching tree species, protection and rehabilitation of the natural potential of forest soils,
- 1.2 Increase the area of stands with a mixed species composition to enhance the ecological value and improve resilience against biotic and abiotic disturbances,
- 1.3 Identification and/or establishment of potential seed sources for sustainable production of good genetic quality tree seed,
- 1.4 Improvement of forest structure regarding conservation value and an enhancement of ecological niches, conservation of rare plant and animal species,
- 1.5 Protection and improvement of forest functions regarding its relevance for climate, water budgeting and soil fertility,
- 1.6 Application of ecological compatible forest utilization techniques (RIL etc.),
- 1.7 A silvicultural system that allows a utilization which inherits the points mentioned above and does not exceed the natural productivity of the forest ecosystem but even enhances it.

**2. Economical sustainability shall be achieved by enclosing the following standards:**

- 2.1 Forest management operations need to be structured and managed as to be sufficiently profitable,

- 2.2 Maximization of profits from forest management under the constraints of ecological and social sustainability,
  - 2.3 Short-term benefits need to be outweighed with eventual long term economic costs and disadvantages.
- 3. Social sustainability shall be achieved by enclosing the following standards:**
- 3.1 All management/enterprise policies and practices must respect the legal framework of Indonesian law,
  - 3.2 Employees must be guaranteed a standard of labour safety,
  - 3.3 The commercial management of Gunung Walat is beneficial for the surrounding communities.
  - 3.4 The feature of Gunung Walat forest as a research forest must be taken into consideration. The implementation of this management plan can be a subject for further research in sustainable forest management.