# General Biophysical Conditions at Grand Forest Park Sultan Thaha Syaifuddin, Jambi

*Iskandar Z. Siregar, Sri Wilarso Budi R and Nurheni Wijayanto*

*Silviculture Laboratory, Department of Silviculture, Faculty of Forestry-IPB*

**Technical Report No. 3**

## Abstract

***It is known that factors influencing land and forest productivities need to be carefully considered while planning restoration, rehabilitation and agroforestry projects at Grand Forest Park Sultan Thaha Syaifuddin (Tahura Senami), Jambi. A preliminary analysis of available secondary data on bio-physical conditions of the project sites was done to capture information on edhapic and climatic factors as well as existing flora and fauna. Results showed that bio-physical conditions at Tahura Senami, i.e. annual temperature, humidity and degree of sunlight are very favorable for most plant species growth. The existing flora and fauna can be used as guide for species choices applied in the project activities on restoration, rehabilitation and agroforestry.***

***Key words: edhaphic factors, climatic factors, flora, fauna***

## Introduction

### *Background*

In the past, the Grand Forest Park (Taman Hutan Raya) Sultan Thaha Syaifuddin or Tahura Senami was well known for its dominant ironwood tree populations. The ironwood grew at almost every part of Jambi forest except in Kerinci District, but due to the present over exploitation, this species can only be found in some limited forest areas such as Tahura Senami, Sengkati, Durian Luncuk, and some areas in Merangin, Sarolangun, Bungo and Tebo Districts. Local people recognized four varieties of ironwood namely *daging, kapur, sirap* and *tanduk* (Irawan and Gruber, 2002).

Historically, Tahura Senami are dominated by iron wood trees (*Eusideroxylon zwageri*), medang (*Litsea* spp.) and balam (*Palaquium* spp.). During the Dutch colonization, the forests belonged to local people, and were known as customary tradition (adat) or marga forests. Since 1955 the forests have been managed by the government forestry services and later by a forest concessionaire.

The Tahura Senami comprises of various stages in its succession processes and are less heterogeneous within and between the sites, consequently they are also less diverse. A range of factors determine the pace at which succession proceeded, including the intensity and duration of the perturbation, the distance to primary forest and the availability of seed-dispersers. General venue conditions such as climate and soil characteristics including accessibility is known to influence succession processes.

The productivity of Tahura Senami may vary in relation to various factors such as site conditions (in particular topsoil and humus conditions), duration of settlement and, more specifically, the number of subsidiary crop-fallow cycles at a particular site. The type and intensity of land-use during the subsidiary cropping stage and the prevalence of disturbances such as accidental burning during the fallow period will all influence productivity.

Degraded forestlands in Tahura Senami are typically characterized by imperata grasses or abandoned unfertile lands, which are usually eroded or nutrient-deficient soils. This soil usually is hydrologic instable, having reduced productivity and low biological diversity. Natural forest regeneration processes in this type of land is very difficult due to the non-availability of suitable microhabitats for plant establishment, which caused low propagule availability (seeds, rootstocks), low soil nutrient availability, the absence of obligate or facultative fungal or bacterial root symbionts, root competition with old field vegetation (particularly grasses), and fire.

Stressful climatic conditions may also limit seedling survival and growth. The relative importance of these factors depends on the original ecosystem, the history of the disturbance, and the landscape pattern. In some situations the intensity, frequency and scale of the disturbance may push the system over an ecological threshold. This may mean that recovery is slow or impossible and that, once abandoned, the site may remain as it is or even continues to degrade.

### *Objectives*

This paper tries to depict the general site conditions of Tahura Senami, especially in the localities where the projects of restoration, rehabilitation and agroforestry are to be carried out.

## Methodology

### *Data collection*

The secondary data collection was focused on current general conditions of the project sites. Various recent reports, including technical reports, student thesis, research reports as well as internet records, were compiled to obtain the best feature of the project sites, in terms of edhapic and climatic factors, including existing species of flora and fauna in the forests.

### *Data Analysis*

Simple analysis was conducted to present descriptive information, simple tabulation or graph illustrations of the project site. Secondary data on general conditions of the site are classified into i) Edaphic factors, ii) Climatic factors, and iii) Flora and Fauna.

# Results & Discussion

### *Edaphic Factors*

Geographically Tahura Senami lies between 1° 45' 55" and 2°14' 30" south latitudes and between 103° 12' 30" and 104°47' 30" east longitudes. In this forest ecosystem, the site for restoration, rehabilitation and agroforestry are approximately located as presented in Figure 1.

In general the field conditions of Tahura Senamis are flat to undulate with an altitude range of 10 – 100 m above seal level. Dominant soils are red yellow podzolic (70%) followed by Alluvial (18%), Granosol (3.24%) and other soils (8.58%).

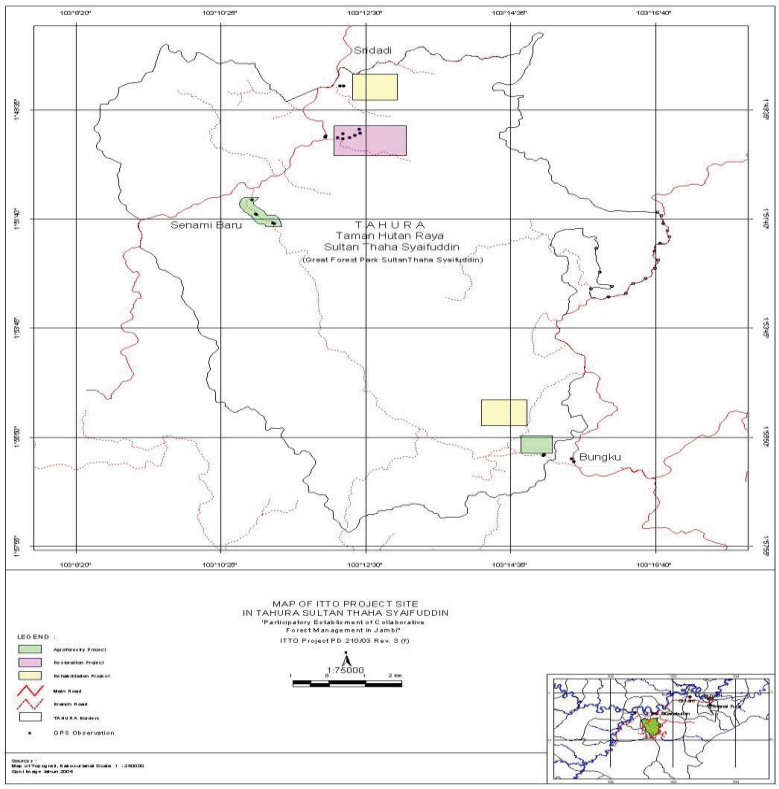


Figure 1. Approximate locations for restoration, rehabilitation and agroforestry projects

Project site for restoration and rehabilitation are located inside the Grand Forest Park or Tahura Senami, while agroforestry sites are found outside the park, in the village of Senami Baru (Table 1). The village enclave within the park and inhabited mostly by indigenous tribe, called Suku Anak Dalam or known as Suku Kubu.

**Table 1. Sizes of the project site and the villages belonged.**

| No. | Project activities | Size (ha) | Village |
|---|---|---|---|
| 1 | Restoration | 200 | Desa Sridadi |
| 2 | Rehabilitation Site#1 | 100 | Desa Sridadi |
| 3 | Rehabilitation Site#2 | 100 | Desa Bungku |
| 4 | Agroforestry Site#1 | 50 | Desa Senami Baru |
| 5 | Agroforestry Site#2 | 50 | Desa Bungku |

***Climatic factors***

As anywhere else, temperature and water availability are fundamental environmental factors at the Tahura Senami. Moreover, since they are directly or indirectly linked to a number of other biophysical factors, data on temperature and precipitation can be used as a basis for approximating characterization of the overall environmental condition. Table 2 and Figure 2 present data on historical weather (2001-2006) as recorded at Sultan Thaha Airport, Jambi, which is located approximately 60 km from Tahura Senami. These records were used as reference since they are the most reliable climate data in the region near Tahura Senami.

**Table 2. Historical mean temperature (2001-2005) recorded at Sultan Thaha Airport (approx. 60 km from Tahura Senami)**

| Month | Years (2001-2005) | | | | |
|---|---|---|---|---|---|
| | 2001 | 2002 | 2003 | 2004 | 2005 |
| Jan | 26.50 | 27.10 | 28.10 | 27.20 | 26.60 |
| Feb | 26.90 | 27.40 | 27.40 | 27.40 | 27.20 |
| Mar | 26.30 | 28.10 | 28.10 | 27.90 | 27.20 |
| Apr | 28.50 | 27.50 | 27.90 | 27.40 | 27.60 |
| May | 28.20 | 29.00 | 28.50 | 27.90 | 27.50 |
| Jun | 27.50 | 28.70 | 28.20 | 27.70 | 27.40 |
| Jul | 28.10 | 28.10 | 28.10 | 26.90 | 27.20 |
| Aug | 27.50 | 28.00 | 27.90 | 28.10 | 26.70 |
| Sep | 29.00 | 28.90 | 28.20 | 28.10 | 27.10 |
| Oct | - | 28.40 | 27.60 | 27.90 | 26.80 |
| Nov | 26.40 | 27.70 | 27.70 | 27.10 | 26.50 |
| Dec | 28.00 | 27.50 | 26.80 | 27.00 | 26.50 |
| Average | 27.54 | 28.03 | 27.88 | 27.55 | 27.03 |

For precipitation data, it was recorded that the data obtained in year 2005 was the most reliable data within the five year period (2001-2005). The average monthly precipitation in 2005 was 221.7 mm, which was higher than that of year 2002 (174.5 mm/month).

It is known that combination of the climate and soil characteristic produce sites with different qualities or indices. Understanding the site quality of a given area is an important factor to set up strategies for sustainable management of available natural resource. Tahura Senami represent typical moist lowland tropical forest, which has

similar general characteristics worldwide with respects to stem density, number of species, diversity and basal area (Lamprecht, 989).

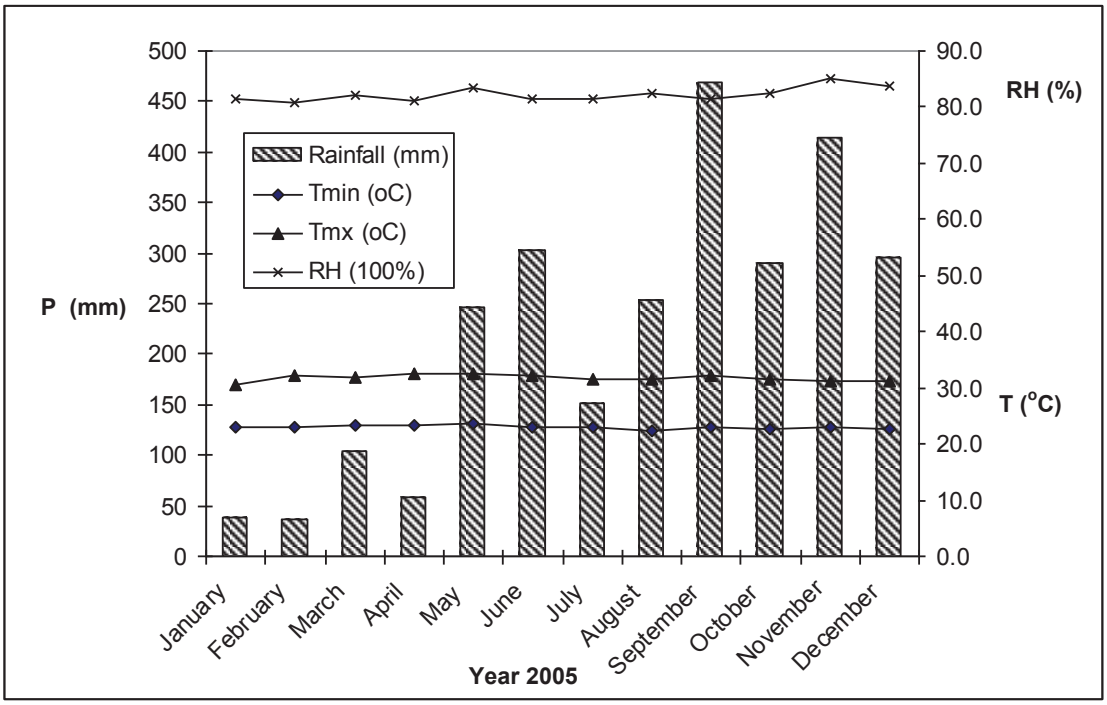


Figure 2. Climatic conditions in 2005 as recorded from Sultan Thaha Airport (approx. 60 km from ITTO Project Sites). Note: P=Precipitation (mm); RH= Relative Humidity (%); T= Temperature ($^{o}$C)

***Flora and Fauna***

Tahura Senami is habitat for several important forest trees such as ironwood (*Eusideroxylon zwageri)*, meranti (*Shorea* spp.), mersawa (*Anisoptera costata*), medang (*Litsea* spp.), balam (*Palaquium* sp.), mahang (*Macaranga* sp.), wild durian (*Durio* sp.), pulai (*Alstonia scholaris*) etc. In this forest, the existence of important animals have been recorded such as wildpig (*Sus scrofa*), macaca (*Macaca fascicularis*), deer (*Cervus* sp.), cobra (*Phyton morukusi*), murai bird (*Copsychus malabarius*), balam bird (*Stretyopila* sp.), eagle (*Elanus* sp.), merbahbird (*Pycnonotus bruneus*) etc (Dinas Kehutanan, 2006).

Irawan and Gruber (2003) mentioned some important species that economically important for wood production in Tahura Senami, namely *Eusideroxylon zwageri*, *Palaquim sp*., *Dyera costulata*, *Litsea sp*., *Shorea sp*., *Hopea mengarawan*, *Tetramerista glabra*, *Ochanostachys amentacea*, *Peronema canescens*, *Koompassia malaccensis*.

Some other species that produce economically important fruit and vegetable, especially for local people are *Nephelium sp*, *Artocarpus rigida*, *Baccarurea crassifolia,*

*Archidendron pauciflorum,*, *Archidendron microflorum*, and *Parkia speciosa*. While Eurycoma *longifolia*, and *E. zwageri* are species known as medicinal plants (Irawan and Gruber, 2003)

## Conclusions

Factors influencing land and forest productivities need to be considered while planning restoration, rehabilitation and agroforestry projects. Baseline information obtained from secondary data sources can help understanding the interaction between edaphic, climatic factors and existing flora and fauna. The information is important in developing sound natural resources management plan. Information from secondary data can be coupled with details coming from primary to sharpen the strategies formulation.

***ACKNOWLEDGMENTS***

This Technical Report No. 3 on General Biophysical Conditions at Grand Forest Park Sultan Thaha Syaifuddin, Jambi has been prepared to fulfill Objective 2 Point 2.4. of the Workplan of ITTO Project PD 210/03. Rev 3 (F): Participatory Establishment of Collaborative Sustainable Forest Management in Dusun Aro, Jambi.

The author would like to thank ITTO, The Ministry of Forestry (GOI), Batang Hari Forest Distric Service, for their support. Appreciation also goes to the Project Steering Committee members for their suggestions.

## References

Dinas Kehutanan Batanghari. 2006. Laporan Pelaksanaan Lapangan Calon Lokasi Rehabilitasi Hutan dan Lahan di Taman Hutan Raya Sultan Thaha Syaifuddin (Tahura Senami). Final Report. Muara Bulian.

Lamprecht, H. 1989. Silviculture in the Tropics. GTZ GmbH. Eschborn.

Irawan, B. and F. Gruber. 2003. A study on tree diversity in association with variability of ironwood (*Eusideroxylon zwageri* T. et B.) in Jambi Indonesia. Deutscher Tropentag. University Goettingen.