

# Green Practice through Petung Bamboo Biodiversity by PT. PJB UP Gresik

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**Abstract**— Benefit of the bamboos tree, especially Petung bamboo, PT. PJB UP Gresik performed the forestification by plant ten thousand Petung bamboo trees along roadside from karang cangkring to babak bao village and dry land in dukun district, to capture CO<sub>2</sub> emission, water conservation, land erosion, as well as biodiversity. The soil water contain exhibit increase year by year as increase the size and height bamboos tree. 3600 m<sup>2</sup> Pentung bamboo plant can be reduce CO<sub>2</sub> emission about 21 tone/years. It is an evidence that the program was successfully performed to maintain planet sustainability trough water conservation, carbon footprint reduction and local plant diversity.

**Index Terms**— Conservation program, Bamboo, ecosystem.

## I. INTRODUCTION

The phenomenon of global warming is the immediate crisis [1]. Today, solution is needed for that problem such as natural conversation to recovery forest function [2]. The conservation requirement must be effective and fast process. The natural conservation, that use wood plants, is needed long time to treatment.

Many research have been clearly established the importance of bamboos tree as an effective natural resource conservation and findings have reported positive utility [3]. Bamboo biological characteristics have been used to solve many environmental problems such as carbon sequential and erosion control as well as regulating soil movement and hydrological flow. In bamboo forest, soil erosion was low than other forest plantation types (178.15 Kg/Ha) [4]. And that also would be increased biodiversity nearby plant. [5]

Bamboo is a plant with fast growth ability with a grow rate from 30 to 100 cm per day in growing season, a good grasp of water hence it increases water reserves in the ground, enabling for sustainable harvesting, and has been known as a useful plant from ancient time [6]. Bamboo is also easy to be planted, does not require specific treatment. Bamboo plant is a mature plant if it at 3-4 years of age, and can be harvested per year without must be damaging cognate [7].

Usage of bamboo for global warming is produced oxygen, 35 % more than other plant, so that can be increase ambient quality of air [8]. Each hectare of bamboo plants was able to absorb up to 62 ton of carbon dioxide from air per

year. Protects against radiation from ultraviolet, atmospheric and soil purifier [9].

One of Indonesia original bamboo type is petung bamboo (*Dendrocalamus asper*). It can be grow well on high humidity and wet conditions, and also grow well in dry condition. It was able to grow up to 20 m height with 12-20 cm of diameter.

Refer to benefit of the bamboos tree, especially Petung bamboo, Jawa-Bali Power Generation Company Gresik Power Generation Unit (PT. PJB UP Gresik) performed the forestation by plant ten thousand Petung bamboo trees along roadside from karang Cangkring to Babak bao village and dry land in Dukun district, to capture CO<sub>2</sub> emission, water conservation, land erosion, as well as biodiversity.

## II. PROCEDURE FOR C PROGRAM

In order to achieve the aim of the program, the procedure should be follow by PT PJB UP Gresik green team, as shown in Figure 1.

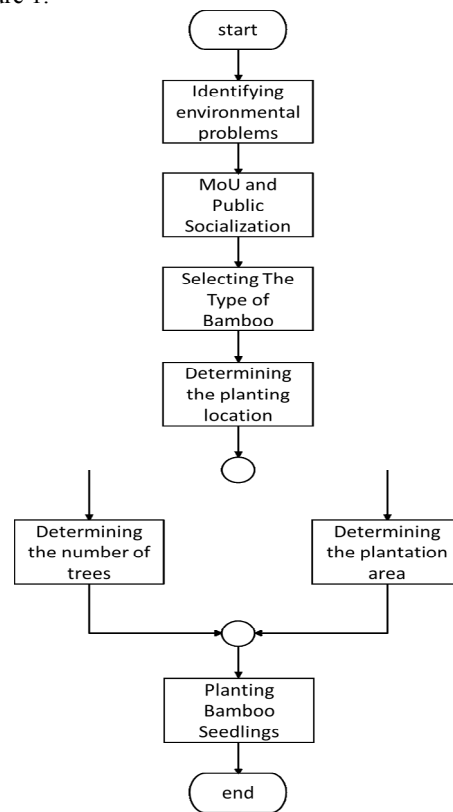


Figure 1. Flowchart of Conservation Program

In the beginning of conservation program, the identification of environmental problems were performed, such as land

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quality degradation, dry land, etc. [10]. Then, signing the MoU between PT PJB UP Gresik and Gresik Government as shown in Figure 3.

Petung bamboo (*Dendrocalamus asper*) was chosen due to their capability to grow well on high humidity and wet conditions, as well as on dry condition. It was able to grow up for 20 m with 12-20 cm of diameter. Based on area and type of selected bamboo, it was decided to plant 10.000 bamboo at different eight areas (Figure 2). The detail areas are tabulated in Table 1.



Figure 2. Bamboo Seedlings

Socialitation the program have been conducted to the society in selected area to obtain awareness and good team wrok to do the program (Figure 4)

Table 1. Table of land planted on roadside

| Village    | Length (m) | Wide (m) | Area (m <sup>2</sup> ) | Lane       |
|------------|------------|----------|------------------------|------------|
| Babakbawon | 850        | 1        | 850                    | Right-side |
| Tebuwung   | 300        | 3        | 900                    | Left-Side  |
| Lowayu     | 300        | 3        | 900                    | Right-side |
| Lowayu     | 550        | 1        | 550                    | Right-side |
| Wonokerto  | 400        | 1        | 400                    | Right-side |



Figure 3. Planting Bamboo Seedlings



Figure 4. The Sozialization of Bamboo Comunitiy

Planting of bamboo seedlings were conducted by PT.PJB UP, Government, and local communities in choosen area i.e. along the roadside from Karang cangkring to Babak bao village, Riverbanks, and dry land in Dukun district (Figure 5).



Figure 5. Planting Bamboo Seedlings

### III. RESULT OF CONSERVATION PROGRAM

Ten thousands Petung bamboo plantation has been perform in some place as shown in Table 1, cover 3600 m<sup>2</sup> area. The soil water contain exhibit increase year by year as increase the size and height bamboos tree as shown in Table 2 and Figure 6. The Table 2 shows, the average water reserve rates about 8335 Gallon/years. The soil water contain data were obtain from sampling laboratory in some point of measurement in whole plantation.

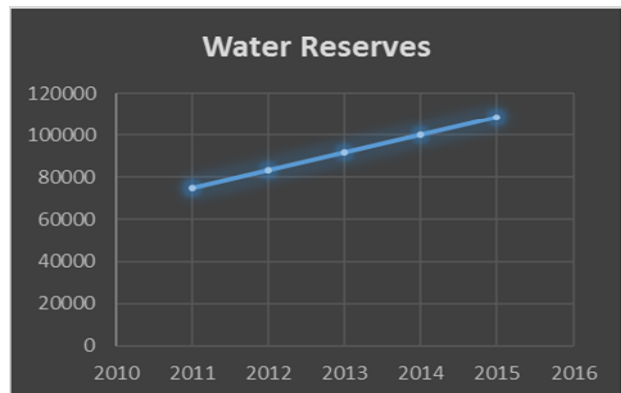


Figure 7. Graph of Water Reserves

Table 2. Water Reserves

| Year | Water Reserves (Gallon) |
|------|-------------------------|
| 2011 | 75015                   |
| 2012 | 83350                   |
| 2013 | 91685                   |
| 2014 | 100020                  |
| 2015 | 108355                  |

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In another hand, 3600 m<sup>2</sup> Pentung bamboo plant can be reduce CO<sub>2</sub> emission about 21 tone/years. It can be conclude that the program was successfully performed to maintain planet sustainability trough water conservation, carbon footprint reduction and local plant diversity.

#### IV. CONCLUSION

Conservation program conducted by PT. PJB UP Gresik and Government is an attempt to maintain planet sustainability especially Gresik district. The soil water contain exhibit increase year by year as increase the size and height bamboos tree. 3600 m<sup>2</sup> Pentung bamboo plant can be reduce CO<sub>2</sub> emission about 21 tone/years. It is an evidence that the program was successfully performed to maintain planet sustainability trough water conservation, carbon footprint reduction and local plant diversity.

#### ACKNOWLEDGMENT

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