PROJECT

IMPROVING FOREST FUNCTIONS IN BENGKULU PROVINCE THROUGH COMMUNITY PARTICIPATION IN REHABILITATION OF DEGRADED FOREST BY USING LOCAL PROSPECTIVE COMMODITIES

TECHNICAL DESIGN OF ACTIVITIES
DURIAN BENTARA ENTRES SOURCES

(Activity 2.1.1. – Improve nursery technology to produce and distribute planting materials)

MINISTRY OF ENVIRONMENT AND FORESTRY, ENVIRONMENT AND FORESTRY SERVICE OF BENGKULU PROVINCE & INTERNATIONAL TROPICAL TIMBER ORGANIZATION (ITTO)

PD 477/07 REV.4 (F)

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Improving Forest Functions in Bengkulu Province Through Community Participation in Rehabilitation of Degraded Forest by Using Local Prospective Commodities.

TECHNICAL DESIGN OF ACTIVITIES DURIAN BENTARA ENTRES SOURCES

Activity 2.1.1. – Improve nursery technology to produce and distribute planting materials

Sub Activity: Improving Seed Sources Management and Nursery Technology to Support the Procurement a High Quality of Durian Bentara and Kayu Bawang Seedlings in Bengkulu Province

Technical Report, December 2017

By: Dr. Gunggung Senoaji, National Expert

Prepared in order to fulfill information related to activities of "Improving Forest Functions in Bengkulu Province Through Community Participation in Rehabilitation of Degraded Forest by Using Local Prospective Commodities".

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PREFACE

This Technical Report is prepared in order to provide a short of information to stakeholders (who involved in activities), and others who wish to learn more about the activities of "Improving Forest Functions in Bengkulu Province Through Community Participation in Rehabilitation of Degraded Forest by Using Local Prospective Commodities" especially in terms of durian (*Durio* spp) propagation.

Acknowledgments and appreciations are shared with all parties involved in the preparation of this report.

Hopefully this report will benefit the readers.

Jakarta, December 2017

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1. INTRODUCTION

1. 1. Background

The ITTO PD 477/07 Rev. 4 (F) program in Bengkulu was initiated in order to participate in the realization of sustainable forest management in Bengkulu Province through rehabilitation of forest areas and forest land by planting local seeded species involving local community participation. The best selected local plant species are kayu bawang (*Azadirachta excelsa*) which has been widely known by the people of Bengkulu as a timber producing tree and durian bentara (*Durio spp*), namely superior durian, both fruitfulness and quality.

In the first year of this ITTO program, seed sources were identified for both local seeded species and a number of seeds were prepared to cover the land within or around the forest area. Around 100 people have been invited to plant this type of tree in the area of HPT (Limited of Production Forest) Air Ketahun and HPT Air Talo, involving the management authority (KPH). To see the growth of the two types of local superior crops, model planting is established around the planting area in the area of HPT Air Ketahun North Bengkulu regency of 5 ha, in the area of HPT Air Talo area of 2 ha and on the land owned by Giri Mulya village of 3 ha, in Seluma District. Demonstration-making activities were carried out in early January 2016, coordinated by forest management authorities (KPH) for those within forest areas and village heads of Giri Mulya for those outside the forest area by involving the community.

Procurement of kayu bawang seeds and seedlings, to date are no significant difficulties. The community and the collectors have sufficiently understood the characteristics of the kayu bawang logs; ranging from flowering time, how to download the seeds, to treat in the making of seeds. There are enough people who make nursery kayu bawang , either for their own needs or traded for the needs of the fulfillment of seeds in Bengkulu. The ITTO program of 2016 has succeeded in establishing a parent tree that will be used as a source of seeds in the Village Penyangkak, Kerkap District, North Bengkulu. Public interest and desire for Durian Bentara, both the demand for seeds and fruits is very high, but the limitations of seeds, the number of trees, and skilled human resources in seed propagation cause market demand can't be fulfilled. This is due durian bentara is a local flagship type of North Bengkulu that has a certificate of national seeds. "Bentara" is an abbreviation of North Bengkulu, the name of the district in Bengkulu Province, where the fruit tree is located. Prior to the issuance of the Decree of the Minister of Agriculture No. 493 / Kpts / SR.120 / 12/2005 On the Release of Durian Bentara as Superior Varieties, this durian variety is locally called Durian Copper Local Batu Layang. The local name reflects the origin of the durian coming from Dusun Batu Layang, Batu Layang Village, Kerkap District, North Bengkulu Regency in Bengkulu Province. This variety has been registered in the Center of Plant Variety Protection and Licensing of Agriculture, Ministry of Agriculture with No. 001 / PVL / 2006, July 21, 2006.

The superiority of Durian Bentara compared with other durian is round fruit shape reversed, fruit easy to split, aroma of fruit, very thick flesh fruit, small oval seeds (*kempet* in local name), yellow copper flesh color fruit, dried fruit and fiber texture, very sweet fruit flesh (legit), average weight of fruit 2.5 - 4 kg / fruit, and well adapted in the lowlands. The special thing of Durian Bentara is its sugar content reaches 25.8 brix, meaning that this durian taste is very sweet in its class. It has a low fat content, i.e. 4%, moisture content of 76%, and fruit production can reach 125-175 fruit / tree / season.

Procurement of durian bentara seeds was relatively little and only in certain circles. The process of manufacture that requires precision and diligence to make the price of durian seeds herald is quite expensive. At the price level of one seedling durian seeds aged 6 months, can reach Rp. 60,000; whereas in place of distributors seedlings that are far from the source, such as in the city of Bengkulu, the price reached Rp. 100,000 per seedlings. Therefore, in the year 2016-2017, the ITTO program has conducted Training of Trainer (TOT) about the vegetative propagation of durian seeds. The problem is how to get entres durian seeds are easy and guaranteed quality?

So far, the durian seed entres were obtained from the parent tree and / or its derivative tree at several locations in North Bengkulu. Durian bentara tree is located in Batu Layang Village, Kerap District, North Bengkulu Regency, Bengkulu Province, owned by a farmer named Sutarkam. The age of this tree, according to its owner, has been over 60 years. Trees were planted by his parents Pak Sutarkam. This parent tree has been the source of seed for the breeding of Durian Bentara seeds. Three farmers in North Bengkulu who usually reproduce Durian Bentara seedlings originally from the parent tree are Pak Sutarkam, Pak Uri, and Pak Sutardi; all citizens in North Bengkulu. An intensive farmer developing Durian Bentara seeds today is Pak Uri who already has one white labeled tree and eight stalks labeled purple as a source of propagation seeds.

To meet the needs of large-scale, Pak Uri as the developer of seedling durian bentara, quite overwhelmed. To order as many as 100 seedlings just have to wait until 6 months. The difficulty of obtaining the entres part and the process of making its vegetative durian seeds is the reason why it is rather difficult to meet the demand for seedlings. The ITTO PD 477/07 program through one of its activities (Activity 2.1.1 - Improve nursery technology to produce and distribute panting materials) intends to develop a "garden entres durian bentara" with a complete kayu bawang plant as a protector.

1. 2. Purpose and Objectives

The Purpose of Preparation of the Technical Design of Durian Bentara Garden Entres Activity is to prepare technical and operational guidance in the implementation of gardening entres durian bentara, in order to be more realistic and easy to be implemented in the field that takes into account the local situation and condition.

The objective of the activities of the preparation of the Technical Design of Durian

Bentara Garden Entres Activity is the compilation of the Durian Bentara Entres Design which contains technical and operational guidance, from seed preparation, land preparation, planting, until maintenance, on the land agreed upon.

1. 3. Theoretical Framework

Durian trees can be propagated by generative and vegetative means. Generative propagation in superior durian is not done, because it does not guarantee the characteristics of the parent plant decreased 100 percent in the seed or seed produced. The choice is through vegetative propagation that is guaranteed to reduce 100% characteristics of the parent plant in the next generation. In addition, planting durian plants by vegetative means will accelerate fruitful time. Durian plants that are generatively propagated will bear fruit after the age of 12-15 years, while durian plants derived from vegetative propagation have been able to produce fruit at the age of 4-5 years.

Vegetative propagation that still considers the environmental function as it is formed by the root is vegetative propagation by means of grafting, grafting and budding. In this way, the multiplication of the durian plant still uses the seeds for the lower stem and the entres rod for the upper trunk; so the plants can still produce taproot roots, unlike pure grafting like transplants. Based on the experience of three farmers of Durian Bentara in Bengkulu, in the proliferation of Durian Bentara, the success of propagation by using the eye patch (grafting) is higher and more favorable than the connect method. In addition, the use of sticky eyes does not damage the parent tree structure.

Propagation of vegetative seedlings will work well if they meet the requirements that include; a) the upper and lower stems are compatible / compatible, b) slices / making of smooth and smooth spots, c) cambium upper stem and cambium rootstock touching flat, d) especially for grafting, wood bark should be easy to peel (sticky eye should be easy removed from the wood part), and e) environmental conditions (moisture and temperature) meet plant requirements for the type of plant to be reproduced. For durian type, altitude less than 800 m a.s.l, rainfall 1,500 - 2,500 mm / year, air temperature 22^{O}C-32^{O}C, the soil is well-drained and aerated, loose soil structure, light intensity 40-50%, soil pH 6-7.

The vegetative propagation technique that has been done for propagation of heralds is grafting (budding), which is the propagation of plants by combining two different parts of the plant in such a way that the vessel tissue portion of each plant can coalesce. Thus, the plant becomes an integral whole and will grow after tissue regeneration of the scar of the joint or the link. The success of propagation of durian bentara plants by spinal eye grafting is determined by the readiness of rootstock and the quality of the sticky eye of the main tree / stem (entres).

The rootstock serves to take food from the ground for the top stem or canopy. Seeds that will be used as rootstocks should be selected that can adapt to the top stem,

so that the seeds can unite and sustain the growth of the stem top. In addition, plants should be in good health, good and deep root system, and do not reduce the quality and quantity of fruit in plants that are connected / inoculated.

ENTRES (SCION) is the top candidate or canopy of the plant which will produce superior quality crops in the future, it can be EYE (grafting) or branch with shoot buds (connection). Entres is connected to the rootstock to combine what qualities are superior in a single plant seed. Therefore entres as the top stem must be taken from the parent tree which is well known to its superior nature; especially for fruit crops (such as durian) should be a tree that has produced the highest quality fruit and tested as desired. The upper stem criteria to be used as entres material must meet the following requirements:

- Derived from a branch that is not too old and not too young (half-woody).
- The color of the skin is light greenish or light gray.
- Select a leafless branch (leaf has fallen). If forced leaf must dirompes, two weeks before taking entres stem.
- Branches to be taken entres it comes from a fertile and healthy plant.
- Entres are taken after the bark looks watery branches indicating that the cambium is active.

2. GENERAL REVIEW

The making of durian bentara garden entres is intended to be able to prepare the needs of durian bulk entrants at all times, owned by the forest management authority (KPHP) in Bengkulu with superior durian fruit quality. The dependence of the top rod (entres) on the individual side can't be guaranteed for its continuity. To create this garden entres durian bentara, it takes a plot of land with a description of the condition of the land as follows:

2. 1. Physical Bio Region

2.1.1. Location and Area

a. Administrative Location
   - Village: Air Merah
   - District: Arma Jaya
   - Regency / Province: North Bengkulu / Bengkulu
   - KPHP: North Bengkulu
   - Land Area: 1,675 m2 (25 m x 67 m)

b. Geographical location
   - Geographically, the location of the garden activity entres durian bentara is located at (about the midpoint) coordinates 03^{O} 27' 20.8" South Latitude and 102^{O} 11' 12.5" East Longitude, with a land area of about 1,675 m2.
   - Hydrologically, the location lies in the Iron Water Basin
   - The location of this entres garden is the land owned by the Provincial Government of Bengkulu, KPHP of North Bengkulu. The location is located behind the office of KPHP Bengkulu Utara.
   - The location is located on Jalan Raya Bengkulu- Argamakmur, about 3 km before Argamakmur Town, in the village of Air Merah, Arma Jaya District, North Bengkulu Regency.
   - The total area of land entrusted to this entrée garden is 1,675 m2 (25 m x 67 m); but from the extent, specifically for planting crops around 1375 m2, the rest for the development plan nurse durian bentara to be inoculated.

c. Land Use Conditions

   The field of prospective entres garden is in the form of high shrubs with interspersed rubber stands that quite a lot, with the size of the rubber tree diameter varies from the diameter of 10 cm - 30 cm. Rubber trees are still productive, visible former wiretap conducted by the community. However, the tapping community, already knowing that the land belongs to the government and will accept if the government will use it. The large number of large diameter rubber trees will have an impact on the length of time and the cost of land clearing. Topographic conditions of the land, consisting of sloping land (65%) and steep-sloping (35%).

d. Type of soil
   - Soil Type: Inceptisol (great group: dystropepts)
   - Soil texture: Somewhat smooth / Fine
   - Soil depth: Very deep

e. Climate Type and Rainfall
   - Climate Type: Type A1 (Oldeman), Type A (Ferguson)
   - Average rainfall per year: 4,135 mm / year
   - Air humidity: 80 to 86%
   - The average number of Rain Days: 169 - 214 rain days / year
   - Air temperature: 26.3oC -27.8oC

f. Elevation Place and Topography

   Elevation Place 140 - 160 meters above sea level, with topography ramps (65%) and steep (35%)

g. Vegetation

   In general, the type of vegetation contained in the demplot area in the form of a thicket of shrub that seemed to form a secondary forest with a number of rubbers stand aged 5-10 years in it. Around the location entres garden in the form of bushes are planned to be built offices and agricultural land North Bengkulu.

Figure 1. Conditions of Vegetation Closures at the Candidate Site

h. Accessibility

   Accessibility to the prospective location of the garden entres durian herald is not constrained by the weather. The road leading to the location of the asphalt road can be passed in the dry and rain season. Distance the location of entres durian garden to several important locations is as follows:
   - City District: 15 Km (Asphalt Road)
   - City District: 3 Km (asphalt road)
   - Provincial City: 45 Km (asphalt road)
   - Air Merah Village Office: 2 Km (asphalt road)

3. TECHNICAL DESIGN OF DURIAN BENTARA ENTRES GARDEN

3.1. Physical Design of Activities

3.1.1 Layout

The planned location for the activities of durian bentara garden entres in the area of Air Merah Village, Armajaya Sub-District, North Bengkulu Regency; precisely behind the office KPHP North Bengkulu, Jl. Raya Bengkulu-Arga Makmur. The total land area of the planned banana durian plant is about 1,675 m2 (25 m x 67 m) located at a position of about 03^{O} 27' 20.8" South latitude and 102^{O} 11' 12.5" East longitude. The altitude of the place ranges from 140 - 160 meters above sea level. The land of this durian entres entity is owned by the Regional Government of Bengkulu Province, at the office of KPHP Bengkulu Utara.

3.1.2. Setup of Entres Durian Bentara Garden

The location of durian bentara garden entres has been jointly agreed between ITTO Project and KKPHP Bengkulu Utara. The use of this land as an entres garden, stipulated in the cooperation agreement between the ITTO with the local government represented by KPHP North Bengkulu.

The condition of the area is a tall shrub that is surrounded by a rubber stand with a diameter of about 10-30 cm. The activity of preparing the garden of entres garden is done in cooperation between ITTO project and KPHP of North Bengkulu, involving the people who live in the demplot location as their workforce. Land preparation activities are:

- Land clearing; ranging from rubber cutting, bush clearing, and land clearing,
- Entres garden landings using barbed wire, to protect crops from wild boar attacks and other animals on site,
- Making the planting hole and installation of the tread in accordance with the pattern of planting has been agreed.

3.1.3. Preparation of Durian Bentara and Kayu bawang

In establishing the durian bentara garden entres, the main seed needed is durian Bentara seeds. In addition, for the protective crop at the edge of the garden entres planted also kayu bawang. Therefore, the seeds for the activities of making this entres garden is the seed of kayu bawang and durian seeds "Bentara" which is superior quality.

Durian seeds "Bentara" prepared, according to the seed certification system of the Ministry of Agriculture, are seeds with blue label or white label or purple label. The process of grafting is supervised by the quality controller of BPSB seedlings of Bengkulu Province, North Bengkulu Regency, so that the seeds of Durian Bentara are produced certified. Durian Bentara single tree originated from Batu Layang Village, Ulu Palik Subdistrict, North Bengkulu Regency, owned by Mr. Sutarkam. The process of making

durian seeds is done by Mr. Uri Ali Almubarok in Unit IV of Arga Mulya Village, Padang Jaya Subdistrict, North Bengkulu.

Seeds of kayu bawang seeds, derived from seeds extracted from the source of kayu bawang seeds in Desa Penyangkak, Kerkap District, North Bengkulu Regency. The process of making kayu bawang seeds is done in the location of KPHP North Bengkulu nursery. Once the seeds are ready to plant, in accordance with the criteria of good seedlings, the seedlings will be transported to the location of the entres garden. Seeds are prepared to meet good physical physiological quality, namely: have a height of 30- 50 cm, healthy, the diameter of the base of the stem of at least 3 mm, the growth medium must be compact, normal seedlings are healthy seeds, single trunked and woody root neck.

The number of seedlings needed for making entres garden is as follows:

- Durian Bentara seedling for planting = 55 stems
- Durian Bentara seedling for replanting = 15 stems
- Seedling of kayu bawang for planting = 35 stems
- Seedling of kayu bawang for replanting = 10 stems

3.1.4. Preparation of Temporary Nursery

Temporary Nursery (TPS/Tempat Persemaian Sementara) are places for recovery of seeds that are stressful due to transport activities from the nursery to the planting site. The location of this TPS is located around the area of planting and/or other safe land, so that there is a watch. Preparation of TPS locations includes:

- Provision of a "shaded" place for temporary storage until seedlings are ready for planting; the extent depends on the number of seeds to be stored.
- Location of TPS near water sources, to facilitate watering; or prepared a means to water the water.
- Provision of equipment including: fungicide sprayers, work tools (hoes, sickles, crowbars, etc.).
- Provision of sustaining labor.

3.1.5. Maintenance of seedlings at TPS

- Shade

  Seeds that require shade in the process of maintenance, given a shade that is adjusted to the intensity of light required by the seeds to grow optimally. Better still if the shade is also installed as a wall that surrounds the rows of beds. The shade frame can be made of bamboo.
- Sprinkling

  Water used is clean water. While the sprinkler used is a solo sprayer with red or yellow colored nozzles. Watering should be done 2 times a day: Morning between 07.00 - 08.00 hours and evening hours 16.00 - 17.00 (local time).

- Fertilization

  Fertilization is done if the seedling duration in TPS is more than 1 month. Fertilizer is given after a long seed in the TPS ± 1 (one) week. Fertilizer used NPK type (15 : 15 : 15) with a total dose of 28 g dissolved in 4.5 liters of water for 300 polybags. If the number of seeds is less than that, it can be done for the next repeat.
- Pest and Disease Control

  Pest and Disease Control in the nursery can be done both physically by cleaning weeds and other garbage that can be the host of any disease by chemical means through the administration of fungicides and insecticides. The dose and concentration to control pests / diseases adjusted with the advice contained on the packaging label. Good spraying time is in the morning between the hours of 07:00 to 10.30 or evening between the hours of 15:00 to 17:00 (local time).

3.1.6. Transporting seeds

The transport of seedlings to the planting area is done after the completion of the planting hole. Seedlings can be transported using carts, baskets or shouldered to the planting site and placed close to prepared plant holes. If the location is steep, transportation can be done in a technically feasible way. If at the location of planting can be achieved by two-wheeled motor vehicle, then the transport by two-wheeled vehicles can be allowed provided that in the transport does not cause damage / death to the seeds.

3.1.7. Planting

Planting the materials is done in the planting hole that has been installed stem. Planting holes are made in accordance with predetermined cropping patterns. In each planting hole that has been created, installed one stem. The size of the plant hole to be made is 25 x 25 x 25 cm for the kayu bawang ; and 40 x 40 x 40 cm for durian "bentara". The quarry resulting from the manufacture of this planting hole is placed on the edge of the pit, where the topsoil is collected at the side of the hole, and then a deeper soil layer is placed on the other side. The hole is left for about 2 weeks so that the pores of the soil that may contain gas are not good to be able to exchange with fresh oxygen. In the planting hole that has been prepared, given manure about 2 kg / hole for durian seeds and about 1 kg for kayu bawang seedlings, to improve fertility.

Materials for plant spray are made from bamboo from around the location. The size of the tread is made as long as 100 cm with a width of 2-3 cm. The installation is done after clearing the land by pulling the rope from the direction of the first line with parallel directions and following the distance of the existing plant. Ajir (stake) is grown with a depth of 30 cm and the remaining 70 cm above ground level.

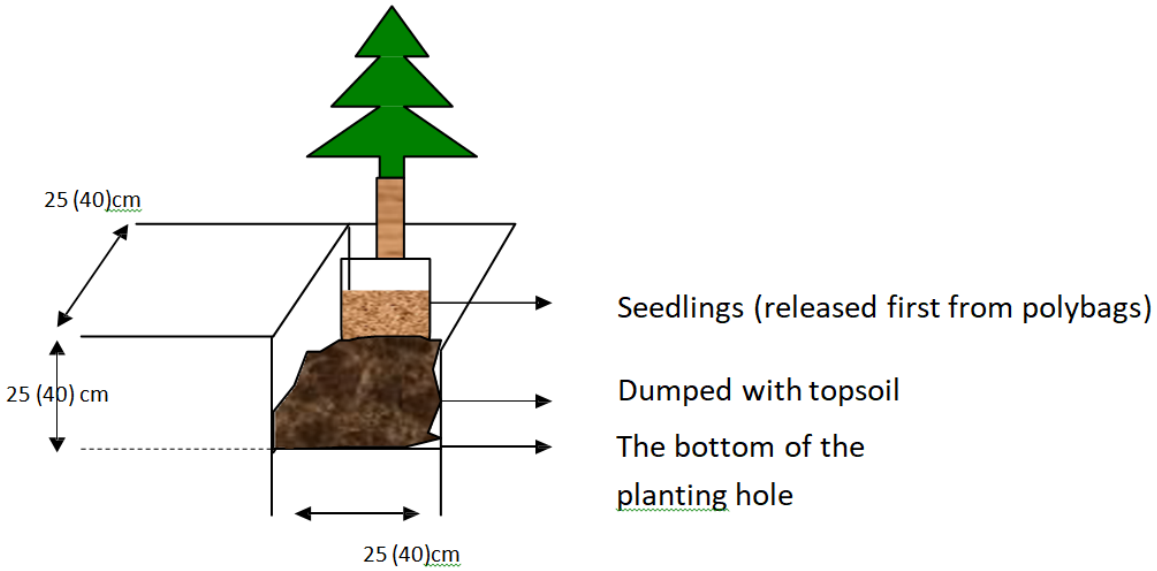


Figure 2. Establishing Planting Hole

The area of land available for entres garden is 1,675 m2 (25 m x 67 m). Of the area that will be used as a garden entres durian bentara is 1.375 m2 (25 m x 55 m). The rest of about 300 m2, will be used as a seedbed location to store seeds to be inoculated, grafted plants, and or for the construction of other supporting facilities.

In establising this entres garden, the main plant is durian herald with the cropping pattern applied to make durian bentara as filler plants (staple plants) and kayu bawang as edge plants. Wood kayu bawang planted at the edge of the land with a spacing of 5 m x 5 m by 1 row or adjusted to the condition of the land. Durian bentara is planted on the inside surrounded by kayu bawang , with a spacing of 5 m x 5 m. With the available land area (1,375 m2) planned to be embedded 55 durian bentara tree, consisting of 11 lines, each row is 5 lanes. At the edges, trees planted kayu bawang as a protective crop for the durian crop of his trail.

The description of planting pattern of gardening entres durian bentara with timber forest plantation as edge plant, is as follows:

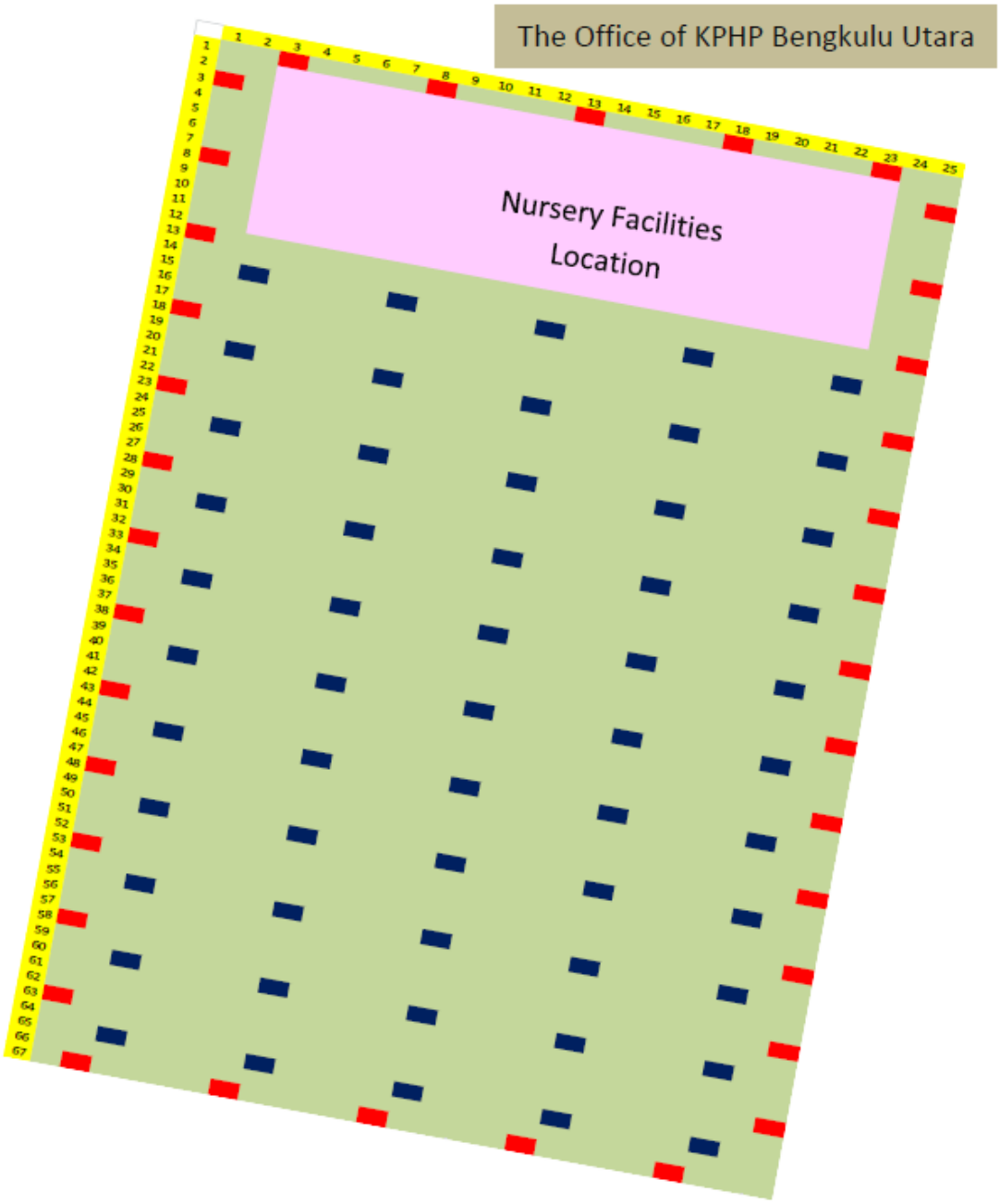


Figure 3. Cropping pattern of garden planting entres durian bentara (distance of kayu Bawang rows: 5m, and durian: 5 m x 5 m)

Seeds that have been provided are planted in planting holes that have been prepared. Before planting polybag should be removed by tearing using a knife, then compacted by squeezing the bag. Seedlings are placed in the center of the hole vertically, dumped carefully with the ground on the side of the hole to the root neck, then the soil around the seedlings are compacted with the path pressed slowly until there is contact with rooting with the soil.

Planting in the field is done during the rainy season (December-January), in the morning or when the weather is cloudy. Once planted, polybag bags are placed on top of the plant to indicate that the hole has been planted. At planting time, plant height measurement, plant diameter, and number of leaves; to know the initial conditions at the time of planting. After the plant is 1 (one) week of fertilization using inorganic fertilizer with dose ± 25 gr per plant.

3.1.8. Percentage of plant growth

Calculation of plant growth percentage, done for 2 times, that is 1 month after planting and 6 month after planting. The number of seeds that grow well compared with the number of seeds planted is the percentage of plant growth. If a plant grows over 80%, it means that the planting of this forest plant is included in the success category. In the calculation of the percentage of growing plants, the dead trees, must be immediately embroidered (replanted) with the same type at the first planting. On observation after 6 months, re-measurement of plant height, plant diameter, and number of leaves.

3.1.9. Maintenance (Year I and II)

First year maintenance can be done if the percentage of plant growth at the end of the current year is ≥ 60%. Maintenance I and II carried out in the second and third year, with components of weeding, aggravating, pest / disease and replanting. The implementation of maintenance I and II begins with a crop evaluation.

To determine maintenance intensity and adjustment of maintenance design. The number of seeds for embroidery on the maintenance of I and II is determined from the results of the plant evaluation

The intensity of maintenance per year can be grouped into 3 (three) categories, namely:

a. Light Maintenance
   - Weeding and soil loosening each one time
   - Replanting with maximum 10%.
b. Medium maintenance
   - Weeding, agitating and pest control once
   - Replanting with maximum 20%
c. Heavy maintenance
   - Weeding, agitating, and disease/pest eradicating at least once.
   - Replanting more than 20%.

The Budget Plan (Rencana Anggaran Biaya/RAB) for Year I and II maintenance is determined from the evaluation of the above crops and in accordance with the availability of funds (a maximum of 30% per year of planting costs).

Technical maintenance activities are broadly included as follows:

- Proper soil conservation techniques to reduce erosion levels and maintain the soil environment.
- Sprinkling
  Watering cultivated at least once a day in the morning / afternoon, except if there is a rainy day.
- Replanting
  To replace the dead or not grow properly plant.
- Weeding and Soil loosening
  Weeding is done to weeds or weeds around the plant (radius ± 0.5 m) by weeding weed root or by using chemicals (herbicides) for weeds of *Imperata* or grass species. It is expected that this activity can be routinely performed by group members every 3 months. While soil loosening done by loosen again the land around the plant to ensure the porosity of the soil. It is expected that this activity can be routinely performed by group members once every 3 months until the plants are 3 years old.
- Fertilization
  Fertilization is done on Year I maintenance and Year II Maintenance activities by using inorganic fertilizer.
- Control of pests and diseases
  If pests and diseases are found in plants, pest and disease eradication efforts are carried out using insecticides and fungicides doses adapted to the condition and age of the plant

3.1.10. Protection and Security

Plants that have been planted need to be protected from disruptions such as animals and others by making barbed wire fences on planted land, and fire prevention efforts need to be done.

3.1.11. Supporting Facilities and Infrastructure

Facilities and infrastructure that need to be prepared include: procurement, procurement of nameplate, organic fertilizer, procurement of equipment and work equipment, procurement of other equipment.

a. Procurement of Plant stake: made of wood or bamboo or similar materials with size according to the needs with the intention to be easy in checking the plant or plant hole. The number of cultivators is adapted to the number of seeds planted.
b. Procurement of materials and nameplate: made rectangle with size 90 cm x 60 cm and mounted on two poles, materials used include board size thick 2 cm x 20 cm x length 4 meters as much as 2 sheets, wooden pole with size 5 cm x 7 cm long 4 meters as much as 2 bars, paint, brush, and others.

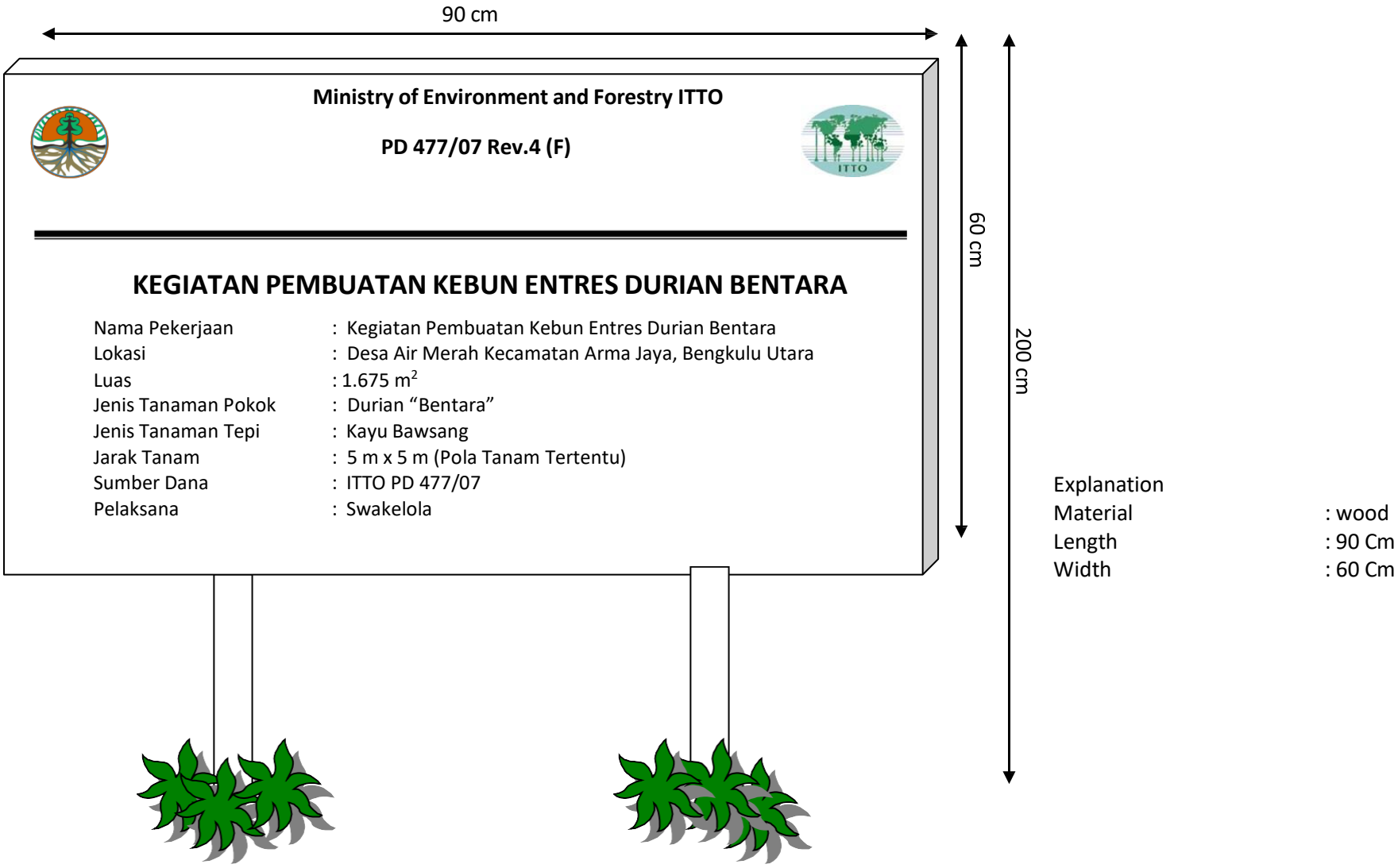
3.2. Budget Plan in Current Year

No	Description of activities	unit	Budget Program		
			Volume	Price per unit (Rp)	Budget (Rp)
1	2	3	7	8	9
I	SALARY				
1	Land Clearing	activity	1	3.500.000	3.500.000
2	making planting holes for durian bentara	hole	55	3.000	165.000
3	making planting holes for kayu bawang	hole	35	2.000	70.000
4	planting and fertilizing	trees	90	2.500	225.000
II	MATERIAL				
1	Durian Bentara Seedlings (planting + 10%)	trees	70		0
2	Kayu bawang Seedlings (planting + 10%)	trees	45		0
3	Plant stake	trees	90	1.500	135.000
4	Manure fertilizer for durian bentara	Kg	110	2.000	220.000
5	Manure ertilizer for kayu bawang	Kg	35	1.500	52.500
6	Chemical fertilizer for durian bentara	Kg	9	10.000	90.750
7	Chemical fertilizer for kayu bawang	Kg	2	10.000	23.100
8	Board activity	unit	1	1.000.000	1.000.000
9	Herbicide/pesticide	activity	1	1.000.000	1.000.000
10	equipment	activity	1	2.500.000	2.500.000
13	Barb Wire Fence	meter	1.050	2.500	2.625.000
III	TRANPORTATION				
1	Mobilizing durian and kayu bawang	activity	1	500.000	500.000
2	Transportation worker	PT	1	150.000	150.000
IV	MAINTENANCE OF THE YEAR				
1	Calculation of plant growth percentage	activity	1		
2	Replanting (max 30%)	trees	30	2.500	75.000
3	Weeding, clearing, Fertilization (2 times)	trees	180	2.500	450.000
4	Preparation of chemical fertilizers	kg	9	10.000	90.000
5	Preparation herbicide (roundup)	Bottle	2	100.000	200.000
6	The 2nd Calculation of grew plant growth	activity	1	?	
V	MAINTENANCE OF THE FIRST YEAR				
1	Weeding, clearing, Fertilization (2 times)	trees	180	2.000	360.000
2	Replanting (max 30%)	trees	30	2.500	75.000
3	Preparation of chemical fertilizers	Kg	9	15.000	135.000
4	Preparation herbicide (roundup)	Bottle	2	100.000	200.000
5	The 3nd Calculation of grew plant growth	activity	1		

No	Description of activities	unit	Budget Program		
			Volume	Price per unit (Rp)	Budget (Rp)
1	**2**	**3**	**7**	**8**	**9**
VI	Supervision of the current year by NE and FC				
1	Supervision of cleaning / land preparation				
	Transport	activity	1	300.000	300.000
	Lumpsum 3 people x 1 day	PD	3	380.000	1.140.000
	local staff honor	PD	2	125.000	250.000
2	Supervision of planting				
	Transport	activity	1	300.000	300.000
	Lumpsum 2 people x 2 days	PD	4	380.000	1.520.000
	Accommodation	PD	2	400.000	800.000
	local staff honor	PD	4	125.000	500.000
3	Supervision of plant evaluation				
	Transport	packet	1	300.000	300.000
	Lumpsum 3 people x 1 day	PD	3	380.000	1.140.000
	local staff honor	PD	2	125.000	250.000
	TOTAL				**20.341.350**

ATTACHMENTS

Attachment 1. Figure of The Board



Explanation

Material	: wood
Length	: 90 Cm
Width	: 60 Cm

Attachment 2. Figure of Stem/Stake

Explanation

Material	: Bamboo
Length	: 100 cm
Width	: 2-3 cm
Planted	: 30 cm (rest 70 cm)