

DETERMINATION OF PROJECT BOUNDARY TO FACILITATE MEASURING AND MONITORING OF CARBON STOCKS

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SUMMARY

Forestry Sector which in the context of climate change is included as LULUCF sector (Land use, land use change and forestry), plays important role in carbon cycle. Meru Betiri National Park (MBNP) located in southern part of East Java is one the National Parks which has been selected for ITTO activities for Demonstration Activities of Reducing Emission for Deforestation and Degradation (REDD. As a DA, these activities should provide information required by international standard and based on COP decision related to credible, measurable, reportable and verifiable (MRV) system for monitoring emission reductions and enhancement of forest carbon stocks. The objectives of this activity are to determine project boundary to facilitate measuring and monitoring of carbon stocks. This activity is expected to provide baseline and basis data spatial about forest inventory and other bio-physical condition, including establishment of representative permanent sample plots (PSP).

Determination of project boundary is undertaken through remote sensing analysis. Some information required to carry out remote sensing works including current maps of land cover, distribution of vegetation, watershed, topography, geology, and earth surface. In addition current recognized boundary assigned by the Ministry of Forestry decree has also been considered. The project boundary as the whole of MBNP covers 58.000 ha. However, for the purpose of REDD mechanism scheme the area would be buffer accordingly.

Determination of PSP in Project Boundary is made by considering representativeness of zone and types of vegetation. Placement of PSP also considers land use categories according to IPCC GL. For this activity 40 PSPs have been made that represent all zones in MBNP, consisting: 17 PSP in nucleus zone, 14 PSP in forest zone, 3 PSP in rehabilitation zone, 4 PSP in utilization zone, and 2 PSP in intensive utilization zone. To apply MRV principle, carbon measurement of PSP refers to IPCC Guideline that measure 5 carbon pools namely above ground biomass, below ground biomass, necromass, litter and soil. For this activity (activity 2.2), initial measurement has been made to identify carbon pools in PSP that consist of above ground biomass (tree, pole and undergrowth), litter (non woody necromas), and soil. This boundary activity is initial works for the whole project. Further works will include determination of baseline based on initial data of PSP and historical

data using remote sensing images. The PSP measuring at 20 x 100 meter are laid down (Cf., Asmoro, 2009, Hairiah dan Rahayu, 2007, Hairiah et al, 2001a dan b) to estimate carbon stocks, this PSPs would support data and information for the purpose of measuring, reporting and verifying forest inventory and carbon accounting in the ground. As basic principle to monitoring changes in REDD is by application of wall-to wall mapping using satellite images and ground truthing through establishment and measurement of PSPs. This is to ensure that the tier 3 and changes of carbon stock can be monitored accurately by applying principles of MRV.

RINGKASAN

Taman Nasional Meru Betiri (TNMB) yang berlokasi di bagian selatan Jawa Timur telah ditetapkan sebagai lokasi kegiatan percontohan (demonstration activity, DA) untuk REDD+ dengan sumber dana dari ITTO. TNMB terdiri dari berbagai tipe vegetasi mulai dari vegetasi pegunungan sampai vegetasi pantai dan kaya akan keragaman jenis, dengan keberadaan masyarakat di dalam dan di sekitar TNMB yang memberikan pengaruh positif dan negatif terhadap keberadaan TNMB. TNMB layak untuk proyek REDD karena kawasan ini telah mengalami deforestasi yang tidak terencana dan degradasi.

Tujuan utama kegiatan ini adalah untuk mendapatkan proses pembelajaran dalam kontribusi penurunan emisi dari degradasi hutan, serta peningkatan stok karbon melalui partisipasi masyarakat dalam upaya konservasi dan pengelolaan TNMB. Kegiatan ini diharapkan dapat menghasilkan pengalaman dan informasi yang diperlukan oleh standar internasional dan didasarkan atas keputusan COP terkait sistem yang kredibel yaitu yang dapat diukur (measurable), dapat dilaporkan (reportable) dan dapat diverifikasi (verifiable) atau MRV untuk keperluan monitoring penurunan emisi. Untuk mencapai ini, dilakukan kegiatan penentuan batas untuk fasilitasi pengukuran dan monitoring stok karbon. Kegiatan penentuan batasan kegiatan ini merupakan kegiatan awal untuk pengukuran karbon yang memenuhi kaidah MRV, sehingga menghasilkan data yang credible berdasarkan pengukuran yang transparan dan terbuka untuk review. Pekerjaan selanjutnya meliputi penentuan baseline berdasarkan data PSP, serta data history yang akan menggunakan citra satelit.

Hasil dari kegiatan penentuan batas ini telah dilakukan dengan melakukan analisis GIS yang berdasarkan rencana pengelolaan, TNMB dibagi kedalam beberapa zona, yaitu zona inti, zona rimba, zona rehabilitasi, zona pemanfaatan khusus dan zona pemanfaatan intensif, peta penutupan lahan, peta vegetasi (hutan mangrove, hutan pantai, hutan rawa, hutan hujan tropik dan hutan bambu), daerah aliran sungai, topografi, geologi dan permukaan bumi. Penentuan batas ini mempertimbangkan juga Surat Keputusan Menteri Kehutanan sebagai kawasan Taman Nasional yaitu seluas 58.000 ha yang telah diteyapkan oleh Menteri. Pekerjaan GIS juga telah dilaksanakan untuk penentuan petak contoh permanen (Permanent Sample Plots atau PSP) untuk fasilitasi pengukuran karbon. Informasi yang digunakan untuk pekerjaan GIS.

Untuk keperluan inventarisasi karbon, petak ukur permanen (PSP) berukuran 100 x 20 meter telah dibuat, dengan pertimbangan ukuran petak ini telah banyak digunakan dalam pengukuran karbon untuk tipe hutan di Indonesia (misalnya Asmoro, 2009, Hairiah dan Rahayu, 2007, Hairiah et al, 2001a dan b). Sebanyak 40 PSP yang mewakili setiap zona sesuai dengan pembagian tipe penutupan lahan menurut IPCC Guideline (2006) dan penggunaan lahan di TNMB telah dibuat. Dari 40 PSPS, 17 PSP terdapat di zona inti, 14 PSP di zona rimba, 3 PSP di zona rehabilitasi, 4 PSP di zona pemanfaatan dan 2 PSP di zona pemanfaatan khusus.

Pada setiap PSP dilakukan pengukuran karbon untuk menyusun baseline dan Reference Emission Level (REL). Menurut IPCC GL (2006) lima carbon pool yang harus diukur adalah biomasa di atas tanah (AGB/Above Ground Biomass), biomas di bawah tanah (BGB/Below Ground Biomass), necromas berkayu, serasah dan tanah. Pengukuran AGB dilakukan dengan mengukur diameter dan tinggi pohon dan menggunakan persamaan alometrik untuk menghitung kandungan karbon, sehingga tidak dilakukan destruktif sampling. Pengukuran BGB juga menggunakan persamaan alometrik, sedangkan carbon pool lainnya diukur di lapangan.

PSP dibuat dengan mempertimbangkan keterwakilan zona, tipe vegetasi dan kategori lahan menurut IPCC GL. PSP yang telah dibuat di lapangan dipetakan dengan memuat informasi tipe zona, kordinat, penggunaan lahan dan tipe vegetasinya. Pekerjaan awal di lapangan juga telah dilakukan untuk mendukung baseline yaitu analisa vegetasi yang mencatat jenis, mengukur diameter serta tinggi. Selain itu juga telah diukur potensi tumbuhan bawah dan serasah. Contoh tanah juga telah dianalisa untuk mengetahui kandungan karbon.

Hasil kegiatan ini menunjukkan bahwa penentuan batas proyek dan penempatan PSP untuk memonitor stok karbon adalah langkah penting untuk mendukung kegiatan DA REDD. Prinsip dasar untuk memonitor perubahan akibat REDD program pada skala proyek adalah melalui analisa remote sensing menggunakan citra satelit dan pengukuran lapangan melalui pembuatan dan pengukuran di PSP. Hal ini guna memastikan bahwa kegiatan REDD menggunakan Tier 3 dengan tingkat kerincian yang paling tinggi dan memenuhi kriteria MRV.

I. INTRODUCTION

Indonesia is one of the largest tropical forest countries. The forest has contributed to the provision of abundant direct and indirect benefits to local and global community. Based on its functions the forest in Indonesia is divided into production forests, conservation and protection forest, and forests that can be converted to other uses. The total area of conservation forest is approximately 23 million ha, which consist of National parks, Nature reserve and recreation forest.

Forestry Sector which in the context of climate change is included as LULUCF sector (Land use, land use change and forestry), plays important role in carbon cycle. In global level, contribution of LULUCF sector to total emission was 18% (Stern, 2007), meanwhile in national level, it cotributed to about 50% of total GHG emission (SNC, 2009). However, forests also have capability to absorb carbon through their growth, therefore forest can also contribute to global community through its role in reducing GHGs emissions.

International scheme is being developed to include REDD (Reducing Emission from Deforestation and Degradation) as carbon related mechanism to deal with global warming. The idea is enhancing forest carbon stocks through conservation of the existing forests. Undisturbed conservation forests, store significant carbon, and therefore avoiding emission to the atmosphere, meanwhile, illegal logging and forest encroachment increase carbon emission to the atmosphere.

Meru Betiri National Park (MBNP) located in southern part of East Java is one the National Parks which has been selected as the project site for ITTO activities. The total area of the Park is \pm 58000 ha consisting of various vegetation types from mountainous to coastal areas. MBNP is rich of biological diversity and community living surrounding the forest which give both positive and negative effects to the sustainability of the forest.

MBNP is eligible for REDD project because the area has been experiencing unplanned deforestation and degradation. MBNP has been selected as the site for demonstration activities (DA) of REDD through ITTO project. Development objective of this project is to contribute to reducing emissions from deforestation and forest degradation, and enhancing forest carbon stocks through enhanced community participation in conservation and management of the MBNP.

MBNP as ITTO project for DA REDD should provide information required by international standard and based on COP decision related to credible, measurable, reportable and verifiable (MRV) system for monitoring emission reductions from deforestation and forest degradation and enhancement of forest carbon stocks.

II. OBJECTIVE, OUTPUTS AND ACTIVITIES

Objective 2 is to develop a credible, measurable, reportable and verifiable system for monitoring emission reductions from deforestation and forest degradation and enhancement of forest carbon stocks in the Meru Betiri National Park (MBNP). This objective will be achieved through several outputs namely: (1) Output 2.1. Improvement in measurable, reportable and verifiable form of capacity in resource base inventory and carbon accounting (2) Output 2.2. Report on comprehensive baseline data and estimation of emissions reduction and carbon enhancement of the national park and (3) Output 2.3. Establishment and validation of system for monitoring emission reduction and enhancement of carbon stocks.

For Output 2.2. Report on comprehensive baseline data and estimation of emissions reduction and carbon stock enhancement of the national park, will be achieved through the following activities: (1) Activity 2.2.1. Conduct remote sensing analysis (Year 2, Q2 and 3), (2) Activity 2.2.2. Determine project boundary to facilitate measuring and monitoring of carbon stocks. (Year 1, Q1 and 2), (3) Activity 2.2.3. Establish the project baseline to analyze a land-use and land cover change and the associated carbon stock change. (Year 1, Q3 and 4) and (4) Activity 2.2.4 Estimate emissions reduction and enhancement of carbon stocks in the MBNP (Year 3 and 4).

III. BRIEF DESCRIPTION OF MERU BETIRI NATIONAL PARK (MBNP)

Conservation forests are ecosystems with high carbon stocks and rich in biodiversity. Sustainable conservation of these forests is essential to mitigate climate change and to conserve key biodiversity resources and other environmental goods and services provided by these forests. Meru Betiri National Park (MBNP) has been selected for DA REDD as a representative area with many of the challenges usually faced in reducing emission and enhancement of carbon stocks in one side and poverty reduction of community living surrounding the forest on the other side.

MBNP is located in southern part of East Java province and surrounded by two districts of Jember and Banyuwangi with relatively high accessibility. Topographical condition is from hilly areas to lowland areas, coastal and mangrove facing to the Indian Ocean. The Park area consists of tropical rainforest ecosystem with high diversity of floristic potentials (more than 500 identified plant species), such as medicinal plants, ornamental plants, bamboo and various small to relatively large animals.

In term of the function, the area is divided into five zones, namely core zone, intact forest zone, utilization zone, rehabilitation and buffer zones. Each zone is managed specifically based on its specific function. Core zone with total area of 27.900 ha is strictly protected area and allowed only for research and education. Intact forest zone with total area of 22.622 ha is allowed for research and education, limited utilization for ecotourism. Utilization zone with total of 1.285 ha is for research and education, intensive but wise and sustainable utilization for highland and coastal ecotourism. Rehabilitation zone with total area of 4.023 ha is a zone where forest and land rehabilitation (agro-forestry cultivation) involving local community is taking place to strengthen and protect inner zone.

Rehabilitation activities are carried out in this area to restore forest cover from illegal conversion and illegal cultivation since early 1990s. Rehabilitation is carried out based on mutual benefit between the MBNP–Community by planting economically potential species in Agro-forestry plantation model for community benefits and protection-conservation for the MBNP. In this rehabilitation zone, six Agro-forestry models have been introduced by LATIN in cooperation with Bogor Agricultural University. Buffer zone with the total area of 2.155 ha and functions as place for the interaction between community activities and conservation. Several eco-tourism and agro-tourism activities and medicinal plant cultivation have been introduced in this area.

Meru Betiri National Park represents mangrove forest, swamp forest, and lowland rain forest ecosystems. This Park is a natural habitat of the rafflesia flower (*Rafflesia zollingeriana*), and various other plants such as mangrove (*Rhizophora sp.*), api-api (*Avicennia sp.*), waru (*Hibiscus tiliaceus*), nyamplung (*Calophyllum inophyllum*), rengas (*Gluta renghas*), Bungur (*Lagerstroemia speciosa*), pulai (*Alstonia scholaris*), bendo (*Artocarpus elasticus*), and several medicinal plants.

This Park is also home to several protected animals, including 29 species of mammal and 180 species of bird. Meru Betiri National Park is known as the last habitat of the Javan tiger (*Panthera tigris sondaica*) which is now a highly endangered and protected species. However, no traces of this tiger have been found for many years and it is feared to be extinct. Meru Betiri does have other distinct characteristics. Sukamade Beach is a habitat of the leatherback turtle, the hawksbill turtle, the common green turtle, and the Pacific ridley turtle. Several simple breeding facilities have been constructed at this beach to ensure that the turtles, too, do not become extinct.

Degradation due to illegal harvest of the Park biological resources is taking place throughout the landscape which is functionally divided into five zones. The three outer zones, which are utilization, rehabilitation and buffer zones received more pressure from, not only illegal harvest of biological diversity

but also deforestation and encroachment. These illegal activities have caused significant reduction of ecosystem function of the Park, especially on environment. Unfortunately, serial data and information on the overall landscape changes are still lacking and not regularly up-dated. Rehabilitation through Agro-forestry system has been introduced and initiated by local NGO and Bogor Agricultural University involving local community.

This project will absolutely contribute to the environment, especially the ecosystem function provided by MBNP. By improving the park condition in the all zones, the environmental good and services naturally provided by MBNP, will function as before. The improving community livelihood will minimize or reduce the rate of deforestation and forest degradation, since poverty has been the key source of threat to conservation. On the other hand, it will maintain the natural process for carbon offset through various rate of vegetation formation and growth. The successful rehabilitation in rehabilitation zone (as well in buffer zone) will contribute to enhance carbon stocks in the area.

IV. METHODS

4.1. About REDD and it's Methodological Challenge

Contribution of LULUCF in global emission is about 18 % of total GHGs emission (Stern, 2007). About 75 % of it is from developing countries. Among developing countries, Brazil, Indonesia, PNG, are the biggest contributors of emission mainly from deforestation. Emission from deforestation in developing countries tends to increase due to development requirement and population growth. Policy intervention (policy approaches and positive incentives) is required for developing countries to reduce its rate of deforestation while maintaining its requirement for sustainable development.

REDD is basically the activities to reduce emission through avoidance of forest conversion and other activities that cause deforestation and degradation. It is not the activities of planting for carbon sequestration such as A/R CDM, although current discussion on REDD Plus includes management practices and enhancement of carbon stock. Strategy for REDD implementation should in line with national priority and policies and ensure that REDD mechanism will provide benefits to Indonesia. Indonesian's requirement regarding REDD and other international mechanisms: They should support Indonesia towards sustainable development and development priorities (such as: economy, social, pro-growth, pro-job, pro-poor)

REDD is a performance-based activity, therefore methodological aspect is crucial. One of the challenging methodological aspects of REDD including determination of reference emissions level/baseline, calculation of carbon and monitoring as the basic for calculation of emission reduction and incentives. Emission reduction should be real, measurable, and has positive impacts to the environment, and the method should credible, measurable, reportable and verifiable. REDD DA activities including the ITTO MBNP project are expected to provide information for improvement of methodology before REDD is fully implemented in the near future (after 2012). MBNP is selected as

DA REDD and the area is eligible because the occurrence of deforestation and unplanned deforestation

4.2. Determination of Project Boundaries and Permanent Sample Plots

Project boundary for DA REDD is determined as the whole area of MBNP, which has been assigned according to Ministry of Forestry decree. Total project area as the whole MBNP covers 58.000 ha. GIS works have been carried out to produce project boundary and distribution of PSPs. Some information required to carry out GIS works include current maps of land cover, distribution of vegetation, watershed, topography, geology and earth surface.

The area according to management plan of national park is divided into several zones namely nucleus, forest, intensive utilization, buffer (special utilization) and rehabilitation. Meanwhile basic forest types in MBNP consist of mangrove, coastal, swamp, tropical rainforest and bamboo forest.

For ground based inventory, permanent sample plots (PSP) measuring at 20 x 100 meter are laid down to estimate carbon stocks. Total 40 PSPs representing each zone and land use category according to IPCC are made, and can be seen in Table 1.

Table 1. Number and area of PSP in every zone

Zone	Area (Ha)	No. of PSPs (unit)
Nucleus	27,915	17
Forest	22,622	14
Rehabilitation	4,023	3
Utilization	2,155	4
Special utilization	1,285	2
Total	58,000	40

4.3. PSP Design and Measurement of C-Stock

Various design of sample plots have been applied for measurement of carbon stock in forestry project, including 40 x 30 m (JICA-Forde project), 100 x 100 (National Forest Inventory), 200 x 200 (PSP for monitoring of increment in mineral soil, Badan Litbang, 1993), 30 x 30 m (Dahlan et al, 2005), and 20 x 100 m (Asmoro, 2009, Hairiah and Rahayu, 2007, Hairiah et al, 2001a and b). In this project permanent sample plots of 20 x 100 m are applied. The PSPs are used to estimate 5 carbon pools according to IPCC Guideline, namely above ground biomass (AGB), below ground biomass (BGB), dead wood, litter and soil.

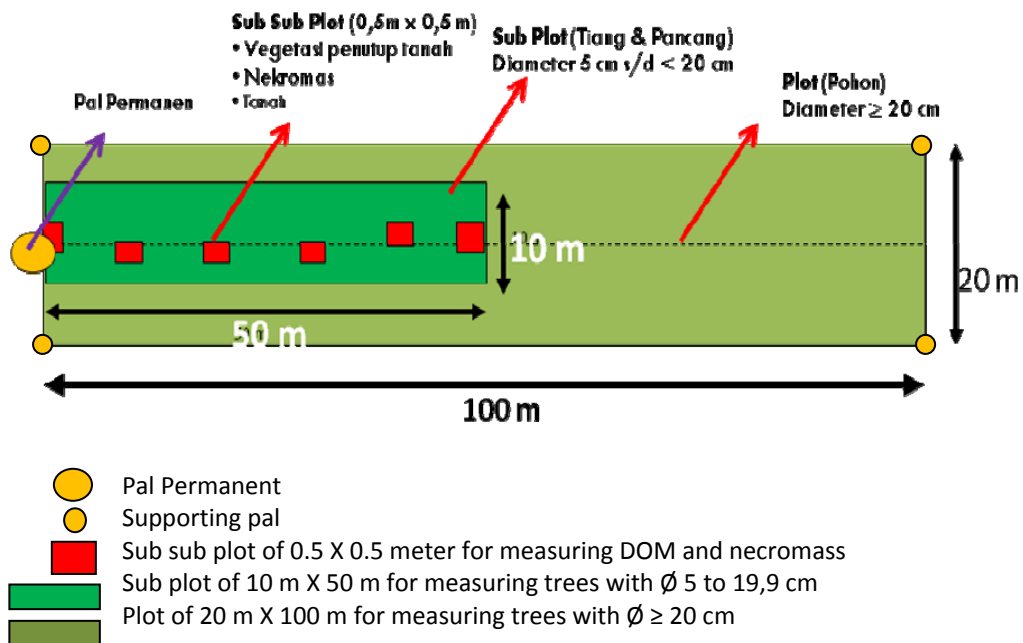


Figure 1. PSP design for measurement of carbon pools

Inventory data are undertaken using tally sheet as can be seen below

a. Tally sheet for PSP

DATA PLOT PERMANENT			Date	:
PSP No. :			Resort	:
Coordinate :			Zone	:
Azimuth :			Land use	:
PH soil :			Type vegetation	:
Humidity :			Dominant species	:
No	Name	Diameter (cm)	Height (m)	Total Height (m)

b. Tally sheet for measuring data on sub plot

DATA SUB PLOT PERMANENT			Date	:
No. PSP :			Resort	:
Coordinate :			Zone	:
Azimuth :			Land use	:
PH soil :			Type of vegetation	:
Humidity :			Dominant trees	:
No	Species	Diameter (cm)	Height	Total (m)

c. Tally sheet for measuring data on sub sub plot

DATA SUB SUB PLOT PERMANENT						
No. of PSP :				Date :		
Coordinate :				Resort :		
Azimuth :				Zone :		
PH soil :				Land use :		
Humidity :				Type vegetation :		
	Sub sub plot 1 (gram)	Sub sub plot 2 (gram)	Sub sub plot 3 (gram)	Sub sub plot 4 (gram)	Sub sub plot 5 (gram)	Sub sub plot 6 (gram)
Necromass						
DOM						
Soil						

Measurement of C- stock in PSP

- **Measurement of Above Ground Biomass (AGB)**

Measurement of AGB is carried out in PSP for living trees and under storey. AGB of living trees is measured with non-destructive method and applies allometric equation to obtain biomass. In PSP measurement is carried out to record diameter of breast height, height and species of the trees. Wood samples with certain diameter are taken to identify wood density. Meanwhile for under storey, destructive sampling will be carried out on sub-plots measuring at 0.5 x 0.5 m. Some allometric equations that can be used are shown in Table 2.

Table 2. Some allometric equations for estimation of tree biomass (Source: Hairiyah dan rahayu, 2007)

Type of trees	Estimation of biomass (kg/tree)	Remark
Branched tree	$B = 0.11 \rho D^{2.62}$	B = Biomass (kg) D = Tree diameter (cm) H = height (cm) ρ = Wood density
Non branched tree	$B = \pi \rho H D^{2/40}$	
Pruned coffee	$B = 0.281 D^{2.06}$	
Banana	$B = 0.030 D^{2.13}$	
Bamboo	$B = 0.131 D^{2.28}$	
Sengon	$B = 0.0272 D^{2.831}$	
Pine	$B = 0.417 D^{2.6576}$	

- **Measurement of Below Ground Biomass (BGB)**

Roots are an important part of the C cycle because they transfer large amounts of C directly into the soil, where it may be stored for a long time; however, roots as carbon stock have often been neglected due to difficulties in measurement. Most of the below-ground biomass of forest is contained in coarse roots (> 2 mm diameter). Similar to the approach for aboveground biomass via allometric relations based on stem diameter, the belowground biomass can be estimated from the proximal roots at the stem base (Hairiah *et al.*, 2001).

However for practical reason, estimation of C stock of roots applies default values. For mixed tropical forest the ratio of above to belowground biomass is approximately 4:1; in very wet conditions the ratio can shift upwards to 10:1, under dry conditions it may decrease to 1:1 (Houghton *et al.*, 2001, Achard *et al.*, 2002, Ramankutty *et al.*, 2007; van Noordwijk *et al.*, 1996).

- **Measurement of woody necromass**

The dead organic matter pool (woody necromass) includes dead fallen trees, and other coarse woody debris above the soil surface. Within the plot, all woody debris and trunks (unburned part), dead standing trees, dead trees on

the ground and stumps are sampled. Their height (length) and diameter are recorded, as well as notes identifying the type of wood for estimating specific density.

- **Measurement of litter (non woody necromass)**

Litter consists of leaves and small branches above the ground as non woody necromass. Litter samples are collected from the same quadrants of 0.50 m x 0.50 m (0.25 m²) as used for under storey sample. Basically it is separated from coarse litter and fine litter. Coarse litter is any tree necromass < 5 cm diameter and/or < 50 cm length, undecomposed plant materials or crop residues, all unburned leaves and branches. Fine litter is at organic layer (0-5 cm above mineral soil layer) in the same quadrates, including all woody roots.

To minimize contamination with mineral soil, the coarse litter samples should be soaked and washed in water; the floating litter is collected, sun dried and weighed, the rest is sieved on a 2 mm mesh sieve and added to the fine litter fraction. A subsample can be taken to obtain dry weight.

- **Soil Samples**

Soil samples are taken from three layers (depth), 0-10 cm, 10-20 cm dan 20-30 cm at six points on each plot. Soil samples are analyzed in the laboratory as composite samples to identify chemical properties such as pH and C content. Undisturbed soil samples are also taken for physical analysis, especially the 'bulk density', and (specific gravity) of the soil which is essential to convert the soil dry weights into soil volume.

V. RESULTS AND DISCUSSION

5.1. Project Boundary

The whole area of MBNP is selected as project boundary. According to Ministry of Forestry decree, the area covers 58.000 ha. This area has been mapped as project boundary. GIS works have been carried out to produce project boundary and distribution of PSPs.

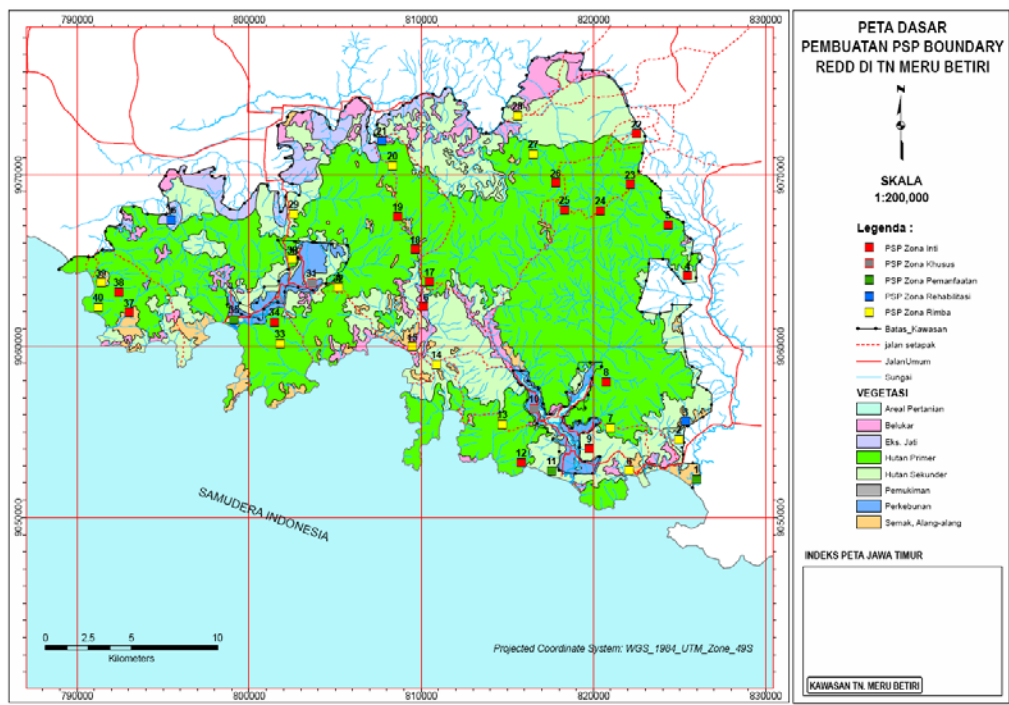


Figure 2. Project Boundary of MBNP and Permanent Sample Plots

Some information required to carry out GIS works include current maps of land cover, distribution of vegetation, watershed, topography, geology and earth surface. The area according to management plan of national park is divided into several zones namely nucleus, forest, intensive utilization, buffer (special utilization) and rehabilitation. Meanwhile basic forest types in MBNP consist of mangrove, coastal, swamp, tropical rainforest and bamboo forest.

DA REDD in MBNP is a project with one of its objectives to reduce emission through REDD-plus project. According to COP decision, action to reduce emission should comply with criteria of Measurable, Reportable and Verifiable (MRV). IPCC Guideline 2006 has been decided by COP as a methodology for inventory of GHGs. For project area in MBNP, a combination of remote sensing and ground based inventory will be applied. This is to obtain transparent estimation and open for review. Several options for sources of remote sensing images included (GOFC-GOLD, 2009).

Table 3. Utility of optical sensors at multiple resolutions for deforestation monitoring

Sensor and Resolution	Examples of current sensors	Minimum Mapping Unit (Change)	Cost	Utility for Monitoring
Coarse (250-1000 m)	SPOT-VGT (1998-) Terra-MODIS (2000-) Envisat-MERIS (2004-)	∞100 ha ∞10-20 ha	Low or free	Consistent pan-tropical annual monitoring to identify large clearings and locate “hotspots” for further analysis with mid resolution
Medium (10-60 m)	Landsat TM or ETM+ Terra-ASTER IRS AwiFs or LISS III CBERS HRCCD DMC SPOT HRV	0.5-5 ha	Landsat and CBERS are free from 2009 <\$0.001/km ² for historical data <\$0.02/km ² for recent data	Primary tool to map deforestation and estimate area change
Fine (<5m)	IKONOS Quickbird Aerial Photos	< 0.1 ha	High to very high \$ 2-30/km ²	Validation of results from coarser resolution analysis

5.2. Placement of PSP

For ground based inventory, permanent sample plots (PSP) measuring at 20 x 100 meter are laid down to estimate carbon stocks. Total 40 PSPs representing each zone and land use category according to IPCC will be made. Current placement of PSPs and their coordinates are shown in the following Tables.

Table 4. Coordinates, zone, land use and vegetation of each PSP

PSP Number	Coordinates		Zone	Land use	Vegetation
	X	Y			
1	825,968	9,052,215	Utilization	Secondary forest	Mangrove
2	824,946	9,054,540	Forest	Cropland	Rice field
3	825,341	9,055,591	Rehabilitation	Grassland	Tropical rain forest
4	825,447	9,064,108	Nucleus	Secondary forest	Bamboo forest
5	824,335	9,067,048	Nucleus	Primary Forest	Bamboo forest
6	822,066	9,052,727	Forest	Secondary forest	Tropical rain forest
7	820,975	9,055,240	Forest	Primary Forest	Tropical rain forest
8	820,725	9,057,899	Nucleus	Primary Forest	Bamboo forest
9	819,747	9,053,991	Nucleus	Secondary forest	Tropical rain forest
10	816,552	9,056,358	Special	Cropland	Estate
11	817,565	9,052,706	Utilization	Secondary forest	Coastal forest
12	815,800	9,053,194	Nucleus	Primary Forest	Coastal forest
13	814,700	9,055,417	Forest	Primary Forest	Tropical rain forest
14	810,872	9,058,926	Forest	Secondary forest	Tropical rain forest
15	809,477	9,059,962	Forest	Shrub	Bamboo forest
16	810,119	9,062,281	Nucleus	Shrub	Bamboo forest
17	810,467	9,063,750	Nucleus	Primary Forest	Tropical rain forest
18	809,639	9,065,633	Nucleus	Primary Forest	Tropical rain forest

Table 4. (Advanced)

PSP Number	Coordinates		Zone	Land use	Vegetation
	X	Y			
19	808,624	9,067,547	Nucleus	Primary Forest	Tropical rain forest
20	808,321	9,070,528	Forest	Primary Forest	Tropical rain forest
21	807,693	9,071,974	Rehabilitation	Secondary forest	Bamboo forest
22	822,486	9,072,384	Nucleus	Secondary forest	Bamboo forest
23	822,139	9,069,420	Nucleus	Primary Forest	Tropical rain forest
24	820,385	9,067,905	Nucleus	Primary Forest	Bamboo forest
25	818,312	9,067,945	Nucleus	Primary Forest	Tropical rain forest
26	817,796	9,069,507	Nucleus	Primary Forest	Tropical rain forest
27	816,494	9,071,205	Forest	Primary Forest	Bamboo forest
28	815,577	9,073,438	Forest	Secondary forest	Bamboo forest
29	802,584	9,067,694	Forest	Secondary forest	Tropical rain forest
30	802,504	9,065,050	Forest	Primary Forest	Tropical rain forest
31	803,629	9,063,672	Special	Cropland	Estate
32	805,169	9,063,410	Forest	Primary Forest	Swamp forest
33	801,782	9,060,138	Forest	Primary Forest	Tropical rain forest
34	801,460	9,061,393	Nucleus	Primary Forest	Tropical rain forest
35	799,109	9,061,538	Utilization	Secondary forest	Teak Forest
36	795,452	9,067,367	Rehabilitation	Cropland	Former teak
37	793,012	9,061,949	Nucleus	Grassland	Tropical rain forest
38	792,430	9,063,143	Nucleus	Primary Forest	Bamboo forest
39	791,397	9,063,687	Forest	Grassland	Bamboo forest
40	791,227	9,062,255	Forest	Primary Forest	Coastal forest

5.3. Initial Data on PSP

Based on field measurement, initial information of PSP is shown in following Tables. Note that these data are to be used for calculation of C-stock for the baseline works.

Table 5. Data of pole/tree on each PSP

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
1	1	Nipah (<i>Nypa fruticans</i>)	825,566.65	9,052,115.93	3.00	1.60
1	2	Nipah (<i>Nypa fruticans</i>)	825,573.90	9,052,113.48	3.00	1.80
1	3	Nipah (<i>Nypa fruticans</i>)	825,567.65	9,052,117.67	3.25	2.00
1	4	Nipah (<i>Nypa fruticans</i>)	825,566.10	9,052,117.98	3.00	1.90
1	5	Nipah (<i>Nypa fruticans</i>)	825,574.83	9,052,114.10	3.25	2.30
1	6	Nipah (<i>Nypa fruticans</i>)	825,569.63	9,052,117.10	2.50	1.70
1	7	Nipah (<i>Nypa fruticans</i>)	825,567.90	9,052,118.10	2.50	1.60
1	8	Nipah (<i>Nypa fruticans</i>)	825,572.30	9,052,116.71	3.25	2.00
1	9	Nipah (<i>Nypa fruticans</i>)	825,573.37	9,052,119.56	3.25	2.30
1	10	Nipah (<i>Nypa fruticans</i>)	825,569.22	9,052,121.38	3.25	1.90
1	11	Nipah (<i>Nypa fruticans</i>)	825,570.77	9,052,121.06	3.25	2.70
1	12	Nipah (<i>Nypa fruticans</i>)	825,572.32	9,052,120.75	3.25	2.20
1	13	Nipah (<i>Nypa fruticans</i>)	825,575.78	9,052,118.75	3.00	2.90
1	14	Nipah (<i>Nypa fruticans</i>)	825,575.67	9,052,120.54	3.25	1.40
1	15	Nipah (<i>Nypa fruticans</i>)	825,576.96	9,052,119.79	2.50	2.20
1	16	Nipah (<i>Nypa fruticans</i>)	825,577.83	9,052,119.29	3.00	2.50
1	17	Nipah (<i>Nypa fruticans</i>)	825,571.33	9,052,123.04	3.25	2.10
1	18	Nipah (<i>Nypa fruticans</i>)	825,569.85	9,052,124.48	3.25	1.70
1	19	Nipah (<i>Nypa fruticans</i>)	825,574.68	9,052,122.84	3.00	1.90
1	20	Nipah (<i>Nypa fruticans</i>)	825,573.02	9,052,124.96	3.25	2.00
1	21	Nipah (<i>Nypa fruticans</i>)	825,571.97	9,052,126.14	3.25	2.40
1	22	Nipah (<i>Nypa fruticans</i>)	825,575.07	9,052,125.51	3.00	1.60
1	23	Nipah (<i>Nypa fruticans</i>)	825,577.92	9,052,124.44	3.25	1.80
1	24	Nipah (<i>Nypa fruticans</i>)	825,574.04	9,052,130.72	3.25	2.30

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
1	25	Nipah (<i>Nypa fruticans</i>)	825,575.58	9,052,130.41	2.50	2.10
1	26	Nipah (<i>Nypa fruticans</i>)	825,582.15	9,052,127.77	3.00	2.40
1	27	Nipah (<i>Nypa fruticans</i>)	825,583.40	9,052,129.94	3.00	1.80
1	28	Nipah (<i>Nypa fruticans</i>)	825,579.93	9,052,131.94	3.00	2.00
1	29	Nipah (<i>Nypa fruticans</i>)	825,577.15	9,052,134.12	3.00	2.50
1	30	Nipah (<i>Nypa fruticans</i>)	825,576.60	9,052,136.17	3.25	2.70
1	31	Nipah (<i>Nypa fruticans</i>)	825,580.13	9,052,135.28	3.25	1.70
1	32	Nipah (<i>Nypa fruticans</i>)	825,582.67	9,052,132.67	3.00	1.60
1	33	Nipah (<i>Nypa fruticans</i>)	825,583.23	9,052,134.65	3.25	1.90
1	34	Nipah (<i>Nypa fruticans</i>)	825,580.70	9,052,137.27	3.25	2.00
1	35	Nipah (<i>Nypa fruticans</i>)	825,578.79	9,052,138.95	3.25	2.00
1	36	Nipah (<i>Nypa fruticans</i>)	825,586.21	9,052,135.82	3.25	2.30
1	37	Nipah (<i>Nypa fruticans</i>)	825,585.30	9,052,139.23	3.25	2.20
1	38	Nipah (<i>Nypa fruticans</i>)	825,584.00	9,052,139.98	3.00	1.80
1	39	Nipah (<i>Nypa fruticans</i>)	825,582.45	9,052,140.30	3.25	2.80
1	40	Nipah (<i>Nypa fruticans</i>)	825,580.10	9,052,142.23	3.25	2.30
1	41	Nipah (<i>Nypa fruticans</i>)	825,582.90	9,052,144.08	3.25	2.00
1	42	Nipah (<i>Nypa fruticans</i>)	825,585.75	9,052,143.01	3.25	3.00
1	43	Nipah (<i>Nypa fruticans</i>)	825,588.28	9,052,140.40	3.25	2.80
1	44	Nipah (<i>Nypa fruticans</i>)	825,589.83	9,052,140.08	3.00	1.80
1	45	Nipah (<i>Nypa fruticans</i>)	825,583.10	9,052,147.43	3.25	1.80
1	46	Nipah (<i>Nypa fruticans</i>)	825,586.38	9,052,146.11	3.25	1.90
1	47	Nipah (<i>Nypa fruticans</i>)	825,589.17	9,052,143.93	3.25	2.50
1	48	Nipah (<i>Nypa fruticans</i>)	825,589.30	9,052,146.16	3.25	2.40
1	49	Nipah (<i>Nypa fruticans</i>)	825,592.15	9,052,145.09	3.00	2.00
1	50	Nipah (<i>Nypa fruticans</i>)	825,587.63	9,052,148.27	3.25	1.70
1	51	Nipah (<i>Nypa fruticans</i>)	825,585.04	9,052,149.77	3.25	2.70
1	52	Nipah (<i>Nypa fruticans</i>)	825,592.53	9,052,147.76	3.25	2.20

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
1	53	Nipah (<i>Nypa fructicans</i>)	825,589.07	9,052,149.76	3.25	1.80
1	54	Nipah (<i>Nypa fructicans</i>)	825,585.85	9,052,152.19	3.25	1.70
1	55	Nipah (<i>Nypa fructicans</i>)	825,588.77	9,052,152.24	3.25	1.90
1	56	Nipah (<i>Nypa fructicans</i>)	825,591.37	9,052,150.74	3.25	2.00
1	57	Nipah (<i>Nypa fructicans</i>)	825,593.53	9,052,149.49	3.25	1.60
1	58	Nipah (<i>Nypa fructicans</i>)	825,587.35	9,052,154.79	2.50	1.80
1	59	Nipah (<i>Nypa fructicans</i>)	825,593.05	9,052,152.65	3.25	2.20
1	60	Nipah (<i>Nypa fructicans</i>)	825,595.46	9,052,151.84	3.25	2.80
1	61	Nipah (<i>Nypa fructicans</i>)	825,591.63	9,052,155.20	3.25	1.80
1	62	Nipah (<i>Nypa fructicans</i>)	825,589.65	9,052,155.77	3.25	1.60
1	63	Nipah (<i>Nypa fructicans</i>)	825,588.35	9,052,156.52	3.00	2.40
1	64	Nipah (<i>Nypa fructicans</i>)	825,593.18	9,052,154.89	2.50	2.50
1	65	Nipah (<i>Nypa fructicans</i>)	825,594.67	9,052,153.45	3.00	1.80
1	66	Nipah (<i>Nypa fructicans</i>)	825,595.85	9,052,154.50	3.25	1.90
1	67	Nipah (<i>Nypa fructicans</i>)	825,590.22	9,052,157.75	3.25	2.30
2	1	Petai (<i>Parkia speciosa</i>)	825,119.73	9,053,855.69	30.00	16.00
2	2	Kelapa (<i>Cocos nucifera</i>)	825,117.79	9,053,854.11	32.00	35.00
2	3	Kelapa (<i>Cocos nucifera</i>)	825,106.99	9,053,854.23	30.00	35.00
2	4	Kelapa (<i>Cocos nucifera</i>)	825,108.32	9,053,859.56	30.00	37.00
2	5	Kelapa (<i>Cocos nucifera</i>)	825,096.92	9,053,861.38	27.00	31.00
2	6	Kelapa (<i>Cocos nucifera</i>)	825,090.13	9,053,863.07	28.00	30.00
2	7	Nangka (<i>Artocapus integra</i>)	825,090.01	9,053,860.52	22.00	25.00
2	8	Kelapa (<i>Cocos nucifera</i>)	825,088.92	9,053,858.22	31.00	32.00
2	9	Kelapa (<i>Cocos nucifera</i>)	825,078.97	9,053,863.79	34.00	38.00
2	10	Kelapa (<i>Cocos nucifera</i>)	825,071.45	9,053,870.82	29.00	29.00
2	11	Kelapa (<i>Cocos nucifera</i>)	825,070.85	9,053,862.21	32.00	20.00
2	12	Jati (<i>Tectona grandis</i>)	825,066.12	9,053,865.97	38.00	35.00
2	13	Kelapa (<i>Cocos nucifera</i>)	825,059.81	9,053,869.60	30.00	33.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
2	14	Kelapa (<i>Cocos nucifera</i>)	825,051.32	9,053,872.75	31.00	29.00
2	15	Mahoni (<i>Swietenia macrophylla</i>)	825,048.77	9,053,870.80	20.00	35.00
2	16	Kelapa (<i>Cocos nucifera</i>)	825,050.11	9,053,867.90	35.00	26.00
2	17	Mahoni (<i>Swietenia macrophylla</i>)	825,045.98	9,053,876.14	29.00	17.00
2	18	Mahoni (<i>Swietenia macrophylla</i>)	825,045.50	9,053,874.20	22.00	32.00
2	19	Mahoni (<i>Swietenia macrophylla</i>)	825,045.13	9,053,872.74	21.00	37.00
2	20	Mahoni (<i>Swietenia macrophylla</i>)	825,044.65	9,053,870.80	24.00	39.00
2	21	Kelapa (<i>Cocos nucifera</i>)	825,031.06	9,053,878.31	24.00	21.00
2	22	Kelapa (<i>Cocos nucifera</i>)	825,048.52	9,053,884.27	22.00	8.00
2	23	Mahoni (<i>Swietenia macrophylla</i>)	825,049.49	9,053,881.96	24.00	17.00
2	24	Mahoni (<i>Swietenia macrophylla</i>)	825,050.58	9,053,884.27	26.00	13.00
2	25	Kelapa (<i>Cocos nucifera</i>)	825,056.65	9,053,881.72	30.00	17.00
2	26	Nangka (<i>Artocapus integra</i>)	825,055.19	9,053,884.15	27.00	21.00
2	27	Kelapa (<i>Cocos nucifera</i>)	825,061.26	9,053,879.54	31.00	25.00
2	28	Mahoni (<i>Swietenia macrophylla</i>)	825,061.75	9,053,877.36	21.00	13.00
2	29	Kelapa (<i>Cocos nucifera</i>)	825,076.30	9,053,877.86	31.00	31.00
2	30	Kelapa (<i>Cocos nucifera</i>)	825,081.52	9,053,871.92	34.00	32.00
2	31	Kelapa (<i>Cocos nucifera</i>)	825,083.33	9,053,877.13	37.00	31.00
2	32	Jati (<i>Tectona grandis</i>)	825,081.76	9,053,874.95	26.00	38.00
2	33	Jati (<i>Tectona grandis</i>)	825,087.94	9,053,877.01	38.00	39.00
2	34	Kelapa (<i>Cocos nucifera</i>)	825,090.85	9,053,874.23	26.00	28.00
2	35	Kelapa (<i>Cocos nucifera</i>)	825,115.84	9,053,862.84	24.00	19.00
2	36	Petai (<i>Parkia speciosa</i>)	825,112.80	9,053,869.27	22.00	31.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
2	37	Kelapa (<i>Cocos nucifera</i>)	825,098.61	9,053,872.29	26.00	17.00
3	1	Petai (<i>Parkia speciosa</i>)	826,097.60	9,055,997.68	22.00	8.00
3	2	Kedawung (<i>Parkia timoriana</i>)	826,107.37	9,055,961.76	21.00	15.00
4	1	Joho (<i>Terminalia belerica</i>)	825,468.96	9,063,876.14	43.00	45.00
4	2	Mandung (<i>Andropogon nardus</i>)	825,483.95	9,063,876.63	60.00	35.00
4	3	Langsep (<i>Lansium domesticum</i>)	825,489.49	9,063,888.01	20.00	15.00
4	4	Langsep (<i>Lansium domesticum</i>)	825,489.94	9,063,883.43	21.00	15.00
4	5	Bayur (<i>Pterospermum diversifolium</i>)	825,490.14	9,063,892.44	23.00	25.00
4	6	Durenan (<i>Durio zibethinus</i>)	825,496.86	9,063,888.95	64.00	32.00
4	7	Waru (<i>Hibiscus tiliaceus</i>)	825,486.29	9,063,900.02	26.00	17.00
4	8	Sepat (<i>Litsea umbellata</i>)	825,482.40	9,063,899.69	25.00	26.00
4	9	Bendo (<i>Artocarpus elasticus</i>)	825,481.13	9,063,898.75	62.00	28.00
4	10	Kamitren	825,498.21	9,063,893.50	61.00	25.00
4	11	Kamitren	825,498.42	9,063,896.41	58.00	28.00
4	12	Nyampuh (<i>Litsea monopetala</i>)	825,497.93	9,063,899.20	21.00	15.00
4	13	Langsep (<i>Lansium domesticum</i>)	825,501.53	9,063,899.11	23.00	16.00
4	14	Mandung (<i>Andropogon nardus</i>)	825,501.41	9,063,899.81	32.00	16.00
4	15	Kamitren	825,491.37	9,063,909.89	51.00	23.00
4	16	Jambuan (<i>Eugenia densiflora</i>)	825,501.33	9,063,908.41	42.00	23.00
4	17	Glindungan (<i>Bischofia javanica</i>)	825,506.86	9,063,907.59	42.00	42.00
4	18	Kembang (<i>Michelia sp</i>)	825,509.27	9,063,910.17	56.00	31.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
4	19	Durenan (<i>Durio zibethinus</i>)	825,500.55	9,063,916.89	22.00	14.00
4	20	Nyampuh (<i>Litsea monopetala</i>)	825,497.60	9,063,915.29	23.00	24.00
4	21	Durenan (<i>Durio zibethinus</i>)	825,510.91	9,063,921.23	32.00	15.00
4	22	Langsep (<i>Lansium domesticum</i>)	825,507.35	9,063,929.22	23.00	15.00
4	23	Ketangi (<i>Lagerstroemia spceiosa</i>)	825,504.48	9,063,931.23	120.00	35.00
4	24	Mandung (<i>Andropogon nardus</i>)	825,516.24	9,063,929.71	24.00	12.00
4	25	Durenan (<i>Durio zibethinus</i>)	825,521.97	9,063,931.80	32.00	16.00
4	26	Sepat (<i>Litsea umbellata</i>)	825,524.35	9,063,932.58	22.00	18.00
4	27	Durenan (<i>Durio zibethinus</i>)	825,522.18	9,063,934.71	20.00	15.00
4	28	Jambuan (<i>Eugenia densiflora</i>)	825,526.77	9,063,935.16	31.00	12.00
4	29	Jambuan (<i>Eugenia densiflora</i>)	825,525.13	9,063,936.30	36.00	16.00
4	30	Rau (<i>Dracontomelon mangiferum</i>)	825,529.64	9,063,939.25	21.00	17.00
4	31	Langsep (<i>Lansium domesticum</i>)	825,522.10	9,063,949.41	21.00	16.00
4	32	Langsep (<i>Lansium domesticum</i>)	825,522.63	9,063,954.53	23.00	15.00
4	33	Mandung (<i>Andropogon nardus</i>)	825,534.31	9,063,943.31	26.00	11.00
4	34	Bayur (<i>Pterospermum diversifolium</i>)	825,530.86	9,063,944.49	32.00	17.00
4	35	Bayur (<i>Pterospermum diversifolium</i>)	825,530.95	9,063,948.10	54.00	31.00
4	36	Mangir (<i>Eugenia cymosa</i>)	825,530.70	9,063,949.49	23.00	15.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
4	37	Langsep (<i>Lansium domesticum</i>)	825,535.13	9,063,948.84	23.00	18.00
5	1	Cempagan (<i>Dysoxylum densiflorum</i>)	824,987.11	9,066,880.90	42.00	16.00
5	2	Pepayan	824,978.40	9,066,883.64	32.00	16.00
5	3	Garu (<i>Antidesma montanum</i>)	824,980.86	9,066,861.58	62.00	26.00
5	4	Mundung (<i>Baccaurea racemosa</i>)	824,973.36	9,066,862.13	22.00	12.00
5	5	Rau (<i>Dracontomelon mangiferum</i>)	824,986.66	9,066,859.75	80.00	3.00
5	6	Garu (<i>Antidesma montanum</i>)	824,972.05	9,066,849.19	22.00	30.00
5	7	Cempagan (<i>Dysoxylum densiflorum</i>)	824,973.73	9,066,854.00	34.00	31.00
5	8	Sepat (<i>Litsea umbellata</i>)	824,970.92	9,066,848.33	27.00	12.00
5	9	Garu (<i>Antidesma montanum</i>)	824,975.87	9,066,847.64	35.00	26.00
5	10	Garu (<i>Antidesma montanum</i>)	824,972.62	9,066,846.08	30.00	32.00
5	11	Garu (<i>Antidesma montanum</i>)	824,979.20	9,066,842.63	38.00	25.00
5	12	Putat (<i>Planchonia valida</i>)	824,978.51	9,066,837.67	34.00	25.00
5	13	Cempagan (<i>Dysoxylum densiflorum</i>)	824,967.70	9,066,832.63	22.00	10.00
5	14	Katesan (<i>Macaranga denticulata</i>)	824,982.70	9,066,828.00	43.00	10.00
5	15	Cempagan (<i>Dysoxylum densiflorum</i>)	824,967.01	9,066,827.68	29.00	15.00
5	16	Cempagan (<i>Dysoxylum densiflorum</i>)	824,973.38	9,066,822.74	37.00	18.00
5	17	Cempagan (<i>Dysoxylum densiflorum</i>)	824,970.41	9,066,823.16	100.00	16.00
5	18	Cempagan (<i>Dysoxylum densiflorum</i>)	824,972.53	9,066,823.87	38.00	14.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
5	19	Cempagan (<i>Dysoxylum densiflorum</i>)	824,969.28	9,066,822.31	26.00	15.00
5	20	Mundung (<i>Baccaurea racemosa</i>)	824,967.23	9,066,822.09	21.00	16.00
5	21	Mundung (<i>Baccaurea racemosa</i>)	824,980.53	9,066,819.72	23.00	12.00
5	22	Cempagan (<i>Dysoxylum densiflorum</i>)	824,964.50	9,066,809.85	21.00	12.00
5	23	Menteng (<i>Baccaurea racemosa</i>)	824,971.02	9,066,805.91	31.00	16.00
5	24	Cempagan (<i>Dysoxylum densiflorum</i>)	824,965.09	9,066,799.67	42.00	13.00
5	25	Pakem (<i>Pangium edule</i>)	824,963.69	9,066,793.30	60.00	18.00
5	26	Kayu Kembang	824,976.62	9,066,795.53	30.00	13.00
5	27	Cempagan (<i>Dysoxylum densiflorum</i>)	824,975.79	9,066,789.58	25.00	12.00
5	28	Kayu Kembang	824,970.41	9,066,790.85	23.00	9.00
6	1	Pakem (<i>Pangium edule</i>)	822,176.82	9,052,828.88	50.00	30.00
6	2	Glintungan (<i>Bischofia javanica</i>)	822,157.03	9,052,837.04	40.00	25.00
6	3	Bayur (<i>Pterospermum diversifolium</i>)	822,149.41	9,052,828.79	70.00	45.00
6	4	Langsep (<i>Lansium domesticum</i>)	822,136.49	9,052,832.57	23.00	15.00
6	5	Rau (<i>Dracontomelon mangiferum</i>)	822,136.44	9,052,821.17	20.00	13.00
6	6	Bendo (<i>Artocarpus elasticus</i>)	822,124.27	9,052,816.36	75.00	29.00
6	7	Jambuan (<i>Eugenia densiflora</i>)	822,121.20	9,052,825.89	20.00	15.00
6	8	Berasan (<i>Gomphia serrata</i>)	822,119.20	9,052,829.49	22.00	20.00
6	9	Pakem (<i>Pangium edule</i>)	822,118.66	9,052,825.72	30.00	17.00
6	10	Pakem (<i>Pangium edule</i>)	822,116.19	9,052,813.67	30.00	15.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
6	11	Winong (<i>Tetrameles nudiflora</i>)	822,103.74	9,052,825.35	20.00	16.00
6	12	Jiret	822,102.61	9,052,827.64	20.00	16.00
6	13	Bayur (<i>Pterospermum diversifolium</i>)	822,085.73	9,052,807.58	35.00	25.00
7	1	Wadung (<i>Garcinia tetrandia</i>)	819,600.11	9,055,496.34	31.00	20.00
7	2	Bayur (<i>Pterospermum diversifolium</i>)	819,599.78	9,055,497.29	28.00	30.00
7	3	Bayur (<i>Pterospermum diversifolium</i>)	819,600.40	9,055,498.56	63.00	42.00
7	4	Nyampuh (<i>Litsea monopetala</i>)	819,599.75	9,055,500.45	46.00	32.00
7	5	Sriwil Kutil (<i>Sterculia campanulata</i>)	819,602.59	9,055,501.43	56.00	40.00
7	6	Bayur (<i>Pterospermum diversifolium</i>)	819,603.47	9,055,508.08	23.00	37.00
7	7	Budengan (<i>Diospyros cauliflora</i>)	819,607.55	9,055,511.59	22.00	22.00
7	8	Kenari (<i>Canarium denticulatum</i>)	819,611.63	9,055,515.11	38.00	14.00
7	9	Durenan (<i>Durio zibethinus</i>)	819,593.63	9,055,512.09	22.00	18.00
7	10	Talesan (<i>Persea odoratissima</i>)	819,597.06	9,055,517.50	42.00	40.00
7	11	Lembayungan (<i>Basella rubra</i>)	819,606.45	9,055,527.08	28.00	30.00
7	12	Nyampuh (<i>Litsea monopetala</i>)	819,607.69	9,055,529.62	68.00	32.00
7	13	Lembayungan (<i>Basella rubra</i>)	819,593.80	9,055,526.95	42.00	32.00
7	14	Nyatoh (<i>Palaquium sp</i>)	819,600.71	9,055,531.45	33.00	28.00
7	15	Talesan (<i>Persea odoratissima</i>)	819,600.32	9,055,538.72	35.00	30.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
7	16	Gondang (<i>Ficus variegata</i>)	819,588.30	9,055,539.87	30.00	26.00
7	17	Berasan (<i>Gomphia serrata</i>)	819,599.32	9,055,544.72	33.00	30.00
7	18	Berasan (<i>Gomphia serrata</i>)	819,597.39	9,055,547.23	35.00	30.00
7	19	Kemiri (<i>Aleurites Moluccana</i>)	819,587.23	9,055,552.19	22.00	22.00
7	20	Berasan (<i>Gomphia serrata</i>)	819,594.14	9,055,556.68	22.00	20.00
7	21	Luwingan (<i>Ficus hispida</i>)	819,590.00	9,055,559.49	22.00	21.00
7	22	Berasan (<i>Gomphia serrata</i>)	819,593.46	9,055,561.74	21.00	22.00
7	23	Sapen (<i>Pometia tomentosa</i>)	819,580.19	9,055,560.34	26.00	18.00
7	24	Gondang (<i>Ficus variegata</i>)	819,583.06	9,055,558.16	27.00	22.00
7	25	Gondang (<i>Ficus variegata</i>)	819,583.35	9,055,560.37	32.00	18.00
7	26	Budengan (<i>Diospyros cauliflora</i>)	819,577.65	9,055,561.58	22.00	24.00
7	27	Kemadu (<i>Laportea sinuata</i>)	819,586.16	9,055,564.51	25.00	15.00
7	28	Nyampuh (<i>Litsea monopetala</i>)	819,579.80	9,055,567.61	33.00	20.00
7	29	Mangir (<i>Eugenia cymosa</i>)	819,577.46	9,055,580.55	27.00	18.00
7	30	Berasan (<i>Gomphia serrata</i>)	819,584.37	9,055,585.05	22.00	28.00
8	1	Glindungan (<i>Bischofia javanica</i>)	820,219.92	9,057,705.69	50.00	23.00
8	2	Besole (<i>Chydenanthus ecelcus</i>)	820,221.29	9,057,707.32	60.00	20.00
8	3	Besole (<i>Chydenanthus ecelcus</i>)	820,224.91	9,057,694.59	45.00	23.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
8	4	Rau (<i>Dracontomelon mangiferum</i>)	820,220.53	9,057,698.72	20.00	18.00
8	5	Garu (<i>Antidesma montanum</i>)	820,244.42	9,057,695.29	45.00	25.00
8	6	Besole (<i>Chydenanthus ecelcus</i>)	820,253.02	9,057,694.54	20.00	15.00
8	7	Glindungan (<i>Bischofia javanica</i>)	820,259.54	9,057,706.15	20.00	13.00
8	8	Garu (<i>Antidesma montanum</i>)	820,261.23	9,057,698.26	23.00	17.00
8	9	Garu (<i>Antidesma montanum</i>)	820,262.79	9,057,703.42	25.00	16.00
8	10	Lo (<i>Ficus racemosa var. elongata</i>)	820,266.83	9,057,708.79	20.00	15.00
8	11	Pluncing (<i>Spondias pinnata</i>)	820,303.74	9,057,711.52	23.00	14.00
8	12	Bayur (<i>Pterospermum diversifolium</i>)	820,309.30	9,057,711.00	30.00	27.00
8	13	Rau (<i>Dracontomelon mangiferum</i>)	820,308.96	9,057,703.44	35.00	20.00
8	14	Ketangi (<i>Lagerstroemia speciosa</i>)	820,313.16	9,057,701.30	40.00	17.00
8	15	Rau (<i>Dracontomelon mangiferum</i>)	820,316.10	9,057,713.61	20.00	15.00
9	1	Rau (<i>Dracontomelon mangiferum</i>)	817,197.29	9,057,202.37	39.00	14.00
9	2	Bendo (<i>Artocarpus elasticus</i>)	817,191.07	9,057,225.59	73.00	26.00
9	3	Pakem (<i>Pangium edule</i>)	817,195.20	9,057,204.73	33.00	24.00
9	4	Garu (<i>Antidesma montanum</i>)	817,190.13	9,057,209.96	45.00	25.00
9	5	Putat (<i>Planchonia valida</i>)	817,186.17	9,057,211.10	25.00	25.00
9	6	Bendo (<i>Artocarpus elasticus</i>)	817,195.37	9,057,215.03	21.00	16.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
9	7	Pakem (<i>Pangium edule</i>)	817,201.06	9,057,212.89	22.00	24.00
9	8	Pakem (<i>Pangium edule</i>)	817,192.04	9,057,219.26	25.00	25.00
9	9	Apak (<i>Ficus benjamina</i>)	817,196.79	9,057,227.49	65.00	25.00
9	10	Acar/gaharu (<i>Aquilatia malaccensis</i>)	817,202.37	9,057,227.15	24.00	14.00
9	11	Slumprit (<i>Terminalia microcarpa</i>)	817,207.18	9,057,236.49	27.00	24.00
9	12	Nyampoh	817,210.38	9,057,245.04	35.00	23.00
9	13	Garu (<i>Antidesma montanum</i>)	817,207.85	9,057,247.65	55.00	28.00
9	14	Garu (<i>Antidesma montanum</i>)	817,212.96	9,057,265.49	25.00	26.00
9	15	Garu (<i>Antidesma montanum</i>)	817,209.27	9,057,260.11	70.00	23.00
9	16	Jiprak	817,230.33	9,057,267.59	22.00	16.00
9	17	Pakem (<i>Pangium edule</i>)	817,231.70	9,057,267.95	42.00	23.00
9	18	Pakem (<i>Pangium edule</i>)	817,223.30	9,057,277.42	75.00	17.00
9	19	Bendo (<i>Artocarpus elasticus</i>)	817,237.37	9,057,287.77	90.00	28.00
10	1	Karet (<i>Hevea brasiliensis</i>)	817,982.86	9,054,958.33	23.00	10.00
10	2	Karet (<i>Hevea brasiliensis</i>)	817,978.40	9,054,978.87	20.00	12.00
10	3	Karet (<i>Hevea brasiliensis</i>)	817,973.76	9,054,980.73	21.00	8.00
10	4	Karet (<i>Hevea brasiliensis</i>)	817,959.59	9,055,000.75	20.00	12.00
10	5	Karet (<i>Hevea brasiliensis</i>)	817,962.96	9,055,009.42	20.00	9.00
10	6	Karet (<i>Hevea brasiliensis</i>)	817,956.09	9,055,021.55	22.00	10.00
11	1	Banetan (<i>Polyalthia sumatrana</i>)	817,144.00	9,053,269.00	48.00	12.00
11	2	Pluncing (<i>Spondias pinnata</i>)	817,140.50	9,053,266.00	40.00	17.00
11	3	Jalanan (<i>Celtis wightii</i>)	817,147.00	9,053,268.50	31.00	11.00
11	4	Berasan (<i>Gomphia serrata</i>)	817,150.50	9,053,268.50	27.00	11.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
11	5	Sriwil Kutil (<i>Sterculia campanulata</i>)	817,148.00	9,053,259.50	49.00	21.00
11	6	Walangan (<i>Eryngium foetidum</i>)	817,153.00	9,053,261.00	21.00	12.00
11	7	Tutup (<i>Mallotus moluccanus</i>)	817,148.00	9,053,256.00	26.00	15.00
11	8	Berasan (<i>Gomphia serrata</i>)	817,148.50	9,053,253.50	22.00	12.00
11	9	Banetan (<i>Polyalthia sumatrana</i>)	817,143.00	9,053,251.00	21.00	10.00
11	10	Walangan (<i>Eryngium foetidum</i>)	817,154.50	9,053,251.00	21.00	12.00
11	11	Poh-pohan (<i>Pilea trinervia</i>)	817,156.00	9,053,249.50	37.00	17.00
11	12	Poh-pohan (<i>Pilea trinervia</i>)	817,152.50	9,053,250.50	27.00	15.00
11	13	Walangan (<i>Eryngium foetidum</i>)	817,138.50	9,053,249.50	23.00	13.00
11	14	Kayu kalongan (<i>Sterculia macrophylla</i>)	817,143.00	9,053,246.00	61.00	25.00
11	15	Walangan (<i>Eryngium foetidum</i>)	817,146.50	9,053,246.00	41.00	14.00
11	16	Walangan (<i>Eryngium foetidum</i>)	817,147.00	9,053,246.00	22.00	12.00
11	17	Jalanan (<i>Celtis wightii</i>)	817,140.00	9,053,244.50	45.00	16.00
11	18	Berasan (<i>Gomphia serrata</i>)	817,142.50	9,053,244.00	26.00	13.00
11	19	Walangan (<i>Eryngium foetidum</i>)	817,141.00	9,053,240.50	28.00	15.00
11	20	Walangan (<i>Eryngium foetidum</i>)	817,141.00	9,053,240.50	20.00	12.00
11	21	Walangan (<i>Eryngium foetidum</i>)	817,147.00	9,053,240.00	41.00	20.00
11	22	Walangan (<i>Eryngium foetidum</i>)	817,147.00	9,053,240.00	38.00	19.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
11	23	Poh-pohan (<i>Pilea Trinervia</i>)	817,147.00	9,053,240.00	29.00	15.00
11	24	Banetan (<i>Polyalthia sumatrana</i>)	817,142.00	9,053,236.00	32.00	15.00
11	25	Apak (<i>Ficus benjamina</i>)	817,145.00	9,053,221.00	54.00	17.00
11	26	Kluntungan (<i>Mischocarpus pentapetalus</i>)	817,148.50	9,053,220.50	22.00	24.00
11	27	Kancilan (<i>Alchornea rugosa</i>)	817,143.00	9,053,218.00	23.00	9.00
11	28	Berasan (<i>Gomphia serrata</i>)	817,143.00	9,053,214.00	22.00	11.00
11	29	Banetan (<i>Polyalthia sumatrana</i>)	817,147.00	9,053,216.00	23.00	19.00
11	30	Banetan (<i>Polyalthia sumatrana</i>)	817,150.00	9,053,213.50	31.00	17.00
11	31	Jalanan (<i>Celtis wightii</i>)	817,138.50	9,053,214.00	44.00	18.00
11	32	Kancilan (<i>Alchornea rugosa</i>)	817,142.00	9,053,206.00	27.00	14.00
11	33	Berasan (<i>Gomphia serrata</i>)	817,151.00	9,053,204.00	34.00	16.00
11	34	Berasan (<i>Gomphia serrata</i>)	817,146.00	9,053,202.50	46.00	16.00
11	35	Pluncing (<i>Spondias pinnata</i>)	817,143.50	9,053,194.00	29.00	13.00
11	36	Berasan (<i>Gomphia serrata</i>)	817,148.00	9,053,193.00	36.00	25.00
11	37	Walangan (<i>Eryngium foetidum</i>)	817,153.50	9,053,193.50	68.00	15.00
11	38	Walangan (<i>Eryngium foetidum</i>)	817,153.50	9,053,193.50	54.00	17.00
11	39	Kemuning (<i>Murraya paniculata</i>)	817,138.50	9,053,191.50	45.00	12.00
11	40	Tutup (<i>Mallotus moluccanus</i>)	817,151.00	9,053,188.00	21.00	13.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
11	41	Banetan (<i>Polyalthia sumatrana</i>)	817,140.50	9,053,188.00	24.00	13.00
11	42	Sapen (<i>Pometia tomentosa</i>)	817,149.00	9,053,185.50	21.00	15.00
11	43	Walangan (<i>Eryngium foetidum</i>)	817,141.00	9,053,181.00	21.00	10.00
11	44	Walangan (<i>Eryngium foetidum</i>)	817,141.00	9,053,181.00	26.00	10.00
11	45	Pala (<i>Myristica fragrans</i>)	817,152.00	9,053,172.50	40.00	27.00
12	1	Cakar ayam (<i>Selaginella doederleinii</i>)	817,758.50	9,052,607.00	35.00	10.00
12	2	Serut (<i>Streblus asper</i>)	817,757.00	9,052,604.00	25.00	12.00
12	3	Pulai (<i>Alstonia scholaris</i>)	817,756.50	9,052,607.00	47.00	25.00
12	4	Cakar ayam (<i>Selaginella doederleinii</i>)	817,756.50	9,052,606.50	28.00	15.00
12	5	Pulai (<i>Alstonia scholaris</i>)	817,752.50	9,052,602.50	41.00	14.00
12	6	Cakar ayam (<i>Selaginella doederleinii</i>)	817,754.00	9,052,609.00	23.00	13.00
12	7	Cakar ayam (<i>Selaginella doederleinii</i>)	817,749.00	9,052,609.00	23.00	14.00
12	8	Cakar ayam (<i>Selaginella doederleinii</i>)	817,748.50	9,052,601.50	23.00	9.00
12	9	Luwingan (<i>Ficus hispida</i>)	817,746.00	9,052,608.00	27.00	7.00
12	10	Luwingan (<i>Ficus hispida</i>)	817,745.50	9,052,606.50	21.00	10.00
12	11	Cakar ayam (<i>Selaginella doederleinii</i>)	817,745.00	9,052,609.50	34.00	12.00
12	12	Luwingan (<i>Ficus hispida</i>)	817,742.50	9,052,605.50	21.00	11.00
12	13	Ledoyo (<i>Dysoxylum amoroides</i>)	817,741.00	9,052,600.00	44.00	17.00
12	14	Cakar ayam (<i>Selaginella doederleinii</i>)	817,731.00	9,052,610.00	34.00	17.00
12	15	Luwingan (<i>Ficus hispida</i>)	817,726.00	9,052,609.50	21.00	10.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
12	16	Bayur (<i>Pterospermum diversifolium</i>)	817,710.00	9,052,597.00	51.00	19.00
12	17	Apak (<i>Ficus benjamina</i>)	817,710.00	9,052,597.50	39.00	21.00
12	18	Luwingan (<i>Ficus hispida</i>)	817,700.00	9,052,612.00	21.00	7.00
12	19	Cakar ayam (<i>Selaginella doederleinii</i>)	817,677.50	9,052,597.50	21.00	10.00
12	20	Cakar ayam (<i>Selaginella doederleinii</i>)	817,675.00	9,052,596.50	23.00	9.00
12	21	Ledoyo (<i>Dysoxylum amoroides</i>)	817,675.00	9,052,596.50	26.00	8.00
13	1	Ledoyo (<i>Dysoxylum amoroides</i>)	814,305.50	9,055,500.50	36.00	17.00
13	2	Bayur (<i>Pterospermum diversifolium</i>)	814,289.50	9,055,496.00	66.00	32.00
13	3	Budengan (<i>Diospyros cauliflora</i>)	814,298.00	9,055,496.00	41.00	25.00
13	4	Garu (<i>Antidesma montanum</i>)	814,302.00	9,055,495.00	22.00	14.00
13	5	Kluwek (<i>Pangium edule</i>)	814,288.00	9,055,491.00	27.00	15.00
13	6	Garu (<i>Antidesma montanum</i>)	814,296.50	9,055,485.00	25.00	18.00
13	7	Putihan (<i>Acronychia trifoliata</i>)	814,297.00	9,055,480.00	27.00	14.00
13	8	Garu (<i>Antidesma montanum</i>)	814,302.00	9,055,476.00	28.00	19.00
13	9	Kembang buruh (<i>Machilus rimosa</i>)	814,306.00	9,055,473.50	28.00	19.00
13	10	Talesan (<i>Persea odoratissima</i>)	814,303.00	9,055,473.00	24.00	14.00
13	11	Joho (<i>Terminalia belerica</i>)	814,292.50	9,055,472.00	57.00	25.00
13	12	Talesan (<i>Persea odoratissima</i>)	814,301.50	9,055,470.00	25.00	23.00

Table 5. (Advanced)

13	13	Garu (<i>Antidesma montanum</i>)	814,303.50	9,055,468.50	123.00	22.00
13	14	Nyampuh (<i>Litsea monopetala</i>)	814,292.50	9,055,456.50	51.00	15.00
13	15	Sapen (<i>Pometia tomentosa</i>)	814,292.00	9,055,451.00	24.00	13.00
13	16	Bendo (<i>Artocarpus elasticus</i>)	814,298.00	9,055,452.00	28.00	20.00
13	17	bayur (<i>Pterospermum diversifolium</i>)	814,288.00	9,055,432.50	44.00	29.00
13	18	Nyampuh (<i>Litsea monopetala</i>)	814,299.50	9,055,432.00	87.00	28.00
13	19	Nyampuh (<i>Litsea monopetala</i>)	814,295.00	9,055,431.00	31.00	23.00
13	20	Jambuan (<i>Eugenia densiflora</i>)	814,292.00	9,055,426.00	27.00	11.00
13	21	Getihan (<i>Rivina humilis</i>)	814,288.00	9,055,422.50	48.00	21.00
13	22	Aren (<i>Arenga pinata</i>)	814,297.00	9,055,428.50	30.00	5.00
13	23	Putihan (<i>Acronychia trifoliata</i>)	814,305.50	9,055,421.00	20.50	18.00
13	24	Bungur (<i>Lagerstroemia speciosa</i>)	814,307.00	9,055,418.00	73.00	16.00
13	25	Apak (<i>Ficus benjamina</i>)	814,307.00	9,055,418.00	51.00	17.00
13	26	Manting (<i>Eugenia polyanthum</i>)	814,301.00	9,055,401.00	30.00	15.00
14	1	Bendo (<i>Artocarpus elasticus</i>)	812,449.00	9,056,909.50	84.00	30.00
14	2	Garu (<i>Antidesma montanum</i>)	812,447.50	9,056,903.00	81.00	25.00
14	3	Besole (<i>Chydenanthus ecelcus</i>)	812,447.00	9,056,899.00	43.00	23.00
14	4	Pakem (<i>Pangium edule</i>)	812,447.50	9,056,909.00	38.00	16.00
14	5	Garu (<i>Antidesma montanum</i>)	812,446.50	9,056,911.00	22.00	11.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
14	6	Kemuning (<i>Murraya paniculata</i>)	812,441.00	9,056,904.00	20.00	12.00
14	7	Slumprit (<i>Terminalia microcarpa</i>)	812,436.50	9,056,903.50	37.00	31.00
14	8	Besole (<i>Chydenanthus ecelcus</i>)	812,435.00	9,056,903.50	47.00	16.50
14	9	Garu (<i>Antidesma montanum</i>)	812,433.50	9,056,910.00	31.00	28.00
14	10	Pakem (<i>Pangium edule</i>)	812,432.00	9,056,909.50	54.00	19.00
14	11	Garu (<i>Antidesma montanum</i>)	812,418.50	9,056,911.50	28.00	20.00
14	12	Bendo (<i>Artocarpus elasticus</i>)	812,419.00	9,056,906.00	45.00	19.00
14	13	Kemuning (<i>Murraya paniculata</i>)	812,415.00	9,056,902.50	20.00	12.00
14	14	Aren (<i>Arenga pinata</i>)	812,415.00	9,056,905.00	39.00	14.00
14	15	Besole (<i>Chydenanthus ecelcus</i>)	812,409.50	9,056,903.00	59.00	17.00
14	16	Aren (<i>Arenga pinata</i>)	812,408.00	9,056,903.50	33.00	5.00
14	17	Pakem (<i>Pangium edule</i>)	812,411.00	9,056,909.50	21.00	11.00
14	18	Rau (<i>Dracontomelon mangiferum</i>)	812,400.00	9,056,910.00	30.00	23.00
14	19	Besole (<i>Chydenanthus ecelcus</i>)	812,399.00	9,056,903.00	78.00	21.00
14	20	Besole (<i>Chydenanthus ecelcus</i>)	812,389.50	9,056,910.00	46.00	18.00
14	21	Apak (<i>Ficus benjamina</i>)	812,381.00	9,056,910.00	81.00	27.00
14	22	Apak (<i>Ficus benjamina</i>)	812,381.00	9,056,910.00	87.00	26.00
14	23	Manting (<i>Eugenia polyanthum</i>)	812,383.50	9,056,900.00	42.00	24.00
14	24	Nyampuh (<i>Litsea monopetala</i>)	812,382.00	9,056,900.00	39.00	27.00
14	25	Pakem (<i>Pangium edule</i>)	812,381.00	9,056,902.00	29.00	15.00
14	26	Serut (<i>Streblus asper</i>)	812,376.00	9,056,900.00	21.00	13.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
14	27	Ketingan (<i>Vitex pubescens</i>)	812,377.50	9,056,907.00	21.00	12.00
14	28	Kesemek (<i>Diospyros kaki</i>)	812,373.50	9,056,911.00	37.00	17.00
14	29	Kesemek (<i>Diospyros kaki</i>)	812,371.00	9,056,908.50	21.00	14.00
14	30	Manting (<i>Eugenia polyanthum</i>)	812,371.50	9,056,903.00	26.00	14.00
14	31	Sentul (<i>Sondaricum koetjapi</i>)	812,371.00	9,056,898.00	40.00	19.00
14	32	Durenan (<i>Durio zibethinus</i>)	812,369.50	9,056,899.00	20.00	15.00
14	33	Durenan (<i>Durio zibethinus</i>)	812,366.00	9,056,898.50	47.00	19.00
14	34	Talesan (<i>Persea odoratissima</i>)	812,360.00	9,056,901.00	21.00	17.00
14	35	Glindungan (<i>Bischofia javanica</i>)	812,358.00	9,056,911.00	34.00	15.00
14	36	Takir (<i>Duabanga moluccana</i>)	812,353.00	9,056,906.50	44.00	21.00
14	37	Manting (<i>Eugenia polyanthum</i>)	812,351.00	9,056,899.50	29.00	16.00
15	1	Garu (<i>Antidesma montanum</i>)	810,922.13	9,059,204.46	44.00	25.00
15	2	Kluntungan (<i>Mischocarpus pentapetalus</i>)	810,920.16	9,059,212.79	28.00	17.00
15	3	Kedu (<i>Planchonella futida</i>)	810,927.68	9,059,215.53	43.00	17.00
15	4	Langsep (<i>Lansium domesticum</i>)	810,921.82	9,059,215.53	25.00	16.00
15	5	Apak (<i>Ficus benjamina</i>)	810,921.82	9,059,215.53	46.00	28.00
15	6	Apak (<i>Ficus benjamina</i>)	810,921.82	9,059,215.53	38.00	29.00
15	7	Putat (<i>Planchonia valida</i>)	810,921.01	9,059,216.30	106.00	29.00
15	8	Talok (<i>Muntingia calabura</i>)	810,913.24	9,059,211.34	26.00	17.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
15	9	Apak (<i>Ficus benjamina</i>)	810,911.79	9,059,212.41	93.00	24.00
15	10	Kemuning (<i>Murraya paniculata</i>)	810,920.50	9,059,223.56	27.00	10.00
15	11	Klampok (<i>Syzygium samarangense</i>)	810,922.68	9,059,224.88	29.00	18.50
15	12	Langsep (<i>Lansium domesticum</i>)	810,922.76	9,059,227.58	27.00	18.00
15	13	Talok (<i>Muntingia calabura</i>)	810,913.15	9,059,226.21	23.00	9.00
15	14	Apak (<i>Ficus benjamina</i>)	810,913.15	9,059,226.21	25.00	18.00
15	15	Garu (<i>Antidesma montanum</i>)	810,915.28	9,059,229.11	21.00	12.00
15	16	Sriwil kutil (<i>Sterculia campanulata</i>)	810,911.70	9,059,233.13	44.00	32.00
15	17	Talok (<i>Muntingia calabura</i>)	810,911.39	9,059,238.34	33.00	26.00
15	18	Kecingal	810,907.81	9,059,242.35	26.00	15.00
15	19	Manting (<i>Eugenia polyanthum</i>)	810,904.81	9,059,259.35	27.00	13.00
15	20	Kluntungan (<i>Mischocarpus pentapetalus</i>)	810,902.97	9,059,262.94	68.00	24.00
15	21	Gempol (<i>Nauclea orientalis</i>)	810,903.78	9,059,268.02	21.00	13.00
15	22	Klampok (<i>Syzygium samarangense</i>)	810,887.68	9,059,272.80	23.00	18.00
15	23	Bungur (<i>Lagerstroemia speciosa</i>)	810,901.77	9,059,277.93	112.00	24.00
15	24	Kedu (<i>Planchonella futida</i>)	810,885.75	9,059,285.40	54.00	17.00
15	25	Kedu (<i>Planchonella futida</i>)	810,901.26	9,059,291.05	21.00	17.00
16	1	Bayur (<i>Pterospermum diversifolium</i>)	810,313.00	9,060,480.00	21.00	15.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
16	2	Krangean (<i>Litsea cubeba</i>)	810,306.50	9,060,484.00	23.00	16.00
16	3	Gondang (<i>Ficus variegata</i>)	810,306.00	9,060,500.50	50.00	18.00
16	4	Bindung (<i>Tetrameles nudiflora</i>)	810,309.00	9,060,504.00	27.00	19.00
16	5	Gondang (<i>Ficus variegata</i>)	810,302.50	9,060,523.00	28.00	20.00
16	6	Krangean (<i>Litsea cubeba</i>)	810,308.00	9,060,565.50	21.00	14.00
17	1	Berasan (<i>Gomphia serrata</i>)	809,983.21	9,063,318.43	63.00	31.00
17	2	Kluntungan (<i>Mischocarpus pentapetalus</i>)	809,975.05	9,063,324.29	64.00	28.00
17	3	Budengan (<i>Diospyros cauliflora</i>)	809,961.31	9,063,330.50	28.00	15.00
17	4	Takir (<i>Duabanga moluccana</i>)	809,930.11	9,063,344.46	34.00	19.00
18	1	Kembang Jelaprang (<i>Carium aspenum</i>)	808,691.80	9,066,816.86	24.00	19.00
18	2	Kedu (<i>Planchonella futida</i>)	808,683.47	9,066,824.68	47.00	23.00
18	3	Gedangan (<i>Corchorus acutangulus</i>)	808,682.58	9,066,826.60	61.00	13.00
18	4	Kecingal	808,680.57	9,066,828.40	22.00	19.00
18	5	Berasan (<i>Gomphia serrata</i>)	808,687.36	9,066,828.05	20.00	16.00
18	6	Kedu (<i>Planchonella futida</i>)	808,685.05	9,066,830.49	23.00	11.00
18	7	Kembang Jelaprang (<i>Carium aspenum</i>)	808,692.36	9,066,831.56	29.00	16.00
18	8	Kembang Jelaprang (<i>Carium aspenum</i>)	808,691.72	9,066,837.11	20.00	14.00
18	9	Nyampuh (<i>Litsea monopetala</i>)	808,690.05	9,066,839.84	38.00	21.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
18	10	Nyampuh (<i>Litsea monopetala</i>)	808,690.61	9,066,842.83	29.00	19.00
18	11	Aren (<i>Arenga pinata</i>)	808,697.96	9,066,845.48	43.00	17.00
18	12	Kluntungan (<i>Mischocarpus pentapetalus</i>)	808,691.98	9,066,852.45	37.00	19.00
18	13	Nyampuh (<i>Litsea monopetala</i>)	808,692.58	9,066,857.02	48.00	23.00
18	14	Aren (<i>Arenga pinata</i>)	808,692.45	9,066,858.13	37.00	6.00
18	15	Suren (<i>Toona sureni</i>)	808,700.82	9,066,857.74	210.00	28.00
18	16	Kluntungan (<i>Mischocarpus pentapetalus</i>)	808,696.51	9,066,861.97	49.00	19.00
18	17	Kluntungan (<i>Mischocarpus pentapetalus</i>)	808,703.09	9,066,865.43	36.00	26.00
18	18	Takir (<i>Duabanga moluccana</i>)	808,698.57	9,066,873.46	25.00	26.00
18	19	Kedu (<i>Planchonella futida</i>)	808,705.66	9,066,872.48	30.00	25.00
18	20	Kluntungan (<i>Mischocarpus pentapetalus</i>)	808,704.38	9,066,883.58	23.00	19.00
18	21	Sapen (<i>Pometia tomentosa</i>)	808,715.74	9,066,882.64	31.00	23.00
18	22	Kenari (<i>Canarium denticulatum</i>)	808,717.62	9,066,887.81	54.00	22.00
18	23	Kembang Karsiki	808,713.18	9,066,893.15	24.00	21.00
18	24	Kedu (<i>Planchonella futida</i>)	808,715.02	9,066,896.74	22.00	24.00
18	25	Pala (<i>Myristica fragrans</i>)	808,709.64	9,066,902.42	53.00	29.00
18	26	Kapasan (<i>Abelmoschus moschantus</i>)	808,708.06	9,066,914.17	34.00	23.00
19	1	Kembang Jelaprang (<i>Carium aspenum</i>)	808,378.37	9,069,113.36	27.00	19.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
19	2	Kembang Jelaprang (<i>Carium aspenum</i>)	808,373.37	9,069,113.09	26.00	18.00
19	3	Gondang (<i>Ficus variegata</i>)	808,372.55	9,069,111.74	24.00	24.00
19	4	Kembang Jelaprang (<i>Carium aspenum</i>)	808,376.22	9,069,105.03	36.00	28.00
19	5	Getihan (<i>Rivina humilis</i>)	808,375.91	9,069,101.51	23.00	15.00
19	6	Kapasan (<i>Abelmoschus moschantus</i>)	808,376.43	9,069,099.33	29.00	16.00
19	7	Aren (<i>Arenga pinata</i>)	808,369.02	9,069,095.72	26.00	7.00
19	8	Kembang Jelaprang (<i>Carium aspenum</i>)	808,371.53	9,069,091.95	48.00	19.00
19	9	Nyampuh (<i>Litsea monopetala</i>)	808,370.32	9,069,090.29	24.00	27.00
19	10	Nyampuh (<i>Litsea monopetala</i>)	808,360.95	9,069,096.78	21.00	16.00
19	11	Kembang Jelaprang (<i>Carium aspenum</i>)	808,360.37	9,069,098.25	40.00	22.00
19	12	Pluncing (<i>Spondias pinnata</i>)	808,355.43	9,069,098.69	63.00	31.00
19	13	Kembang Jelaprang (<i>Carium aspenum</i>)	808,354.61	9,069,097.34	29.00	26.00
19	14	Nyampuh (<i>Litsea monopetala</i>)	808,358.66	9,069,090.95	22.00	17.00
19	15	Kembang Jelaprang (<i>Carium aspenum</i>)	808,355.21	9,069,088.06	54.00	23.00
19	16	Talesan (<i>Persea odoratissima</i>)	808,351.94	9,069,091.18	41.00	24.00
19	17	Getihan (<i>Rivina humilis</i>)	808,350.36	9,069,085.29	47.00	19.00
19	18	Bayur (<i>Pterospermum diversifolium</i>)	808,352.36	9,069,079.79	32.00	17.00
19	19	Rau (<i>Dracontomelon mangiferum</i>)	808,346.99	9,069,079.20	48.00	26.00
19	20	Kembang Buruh (<i>Machilus rimosa</i>)	808,339.16	9,069,083.07	36.00	16.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
19	21	Nyampuh (<i>Litsea monopetala</i>)	808,340.73	9,069,072.64	41.00	18.00
19	22	Nyampuh (<i>Litsea monopetala</i>)	808,342.90	9,069,077.07	28.00	17.00
19	23	Talok (<i>Muntingia calabura</i>)	808,337.27	9,069,073.66	20.00	13.00
19	24	Kembang Buruh (<i>Machilus rimosa</i>)	808,338.37	9,069,070.01	38.00	19.00
19	25	Nyampuh (<i>Litsea monopetala</i>)	808,340.62	9,069,067.33	28.00	12.00
19	26	Kembang Buruh (<i>Machilus rimosa</i>)	808,331.50	9,069,076.65	31.00	21.00
19	27	Kedu (<i>Planchonella futida</i>)	808,307.90	9,069,050.32	26.00	20.00
19	28	Bindung (<i>Tetrameles nudiflora</i>)	808,305.04	9,069,045.96	37.00	21.00
19	29	Bindung (<i>Tetrameles nudiflora</i>)	808,302.47	9,069,049.02	33.00	18.00
20	1	Besole (<i>Chydenanthus ecelcus</i>)	807,853.50	9,070,797.50	62.00	19.00
20	2	Kecingal	807,860.50	9,070,800.50	20.00	11.00
20	3	Klitisan	807,866.00	9,070,797.00	21.00	9.00
20	4	Nangka (<i>Artocapus integra</i>)	807,871.00	9,070,804.00	20.00	12.00
20	5	Rau (<i>Dracontomelon mangiferum</i>)	807,885.50	9,070,805.50	38.00	21.00
20	6	Gondang (<i>Ficus variegata</i>)	807,887.00	9,070,804.00	37.00	21.00
20	7	Pluncing (<i>Spondias pinnata</i>)	807,892.00	9,070,799.00	51.00	27.00
20	8	Nyampuh (<i>Litsea monopetala</i>)	807,899.00	9,070,805.50	39.00	23.00
20	9	Bendo (<i>Artocarpus elasticus</i>)	807,900.00	9,070,798.00	51.00	29.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
20	10	Gondang (<i>Ficus variegata</i>)	807,909.00	9,070,802.00	24.00	20.00
20	11	Pluncing (<i>Spondias pinnata</i>)	807,915.00	9,070,805.50	52.00	14.00
20	12	Klitisan	807,915.00	9,070,800.00	33.00	16.00
20	13	Durenan (<i>Durio zibethinus</i>)	807,927.00	9,070,803.00	23.00	15.00
20	14	Krasak (<i>Ficus annulata</i>)	807,931.50	9,070,795.00	28.00	10.00
21	1	Petai (<i>Parkia speciosa</i>)	809,839.21	9,074,418.63	21.00	8.00
21	2	Kemiri (<i>Aleurites moluccana</i>)	809,837.93	9,074,407.94	26.00	8.00
21	3	Kemiri (<i>Aleurites moluccana</i>)	809,840.83	9,074,408.71	29.00	8.00
21	4	Kemiri (<i>Aleurites moluccana</i>)	809,840.65	9,074,397.80	28.00	9.00
21	5	Kemiri (<i>Aleurites moluccana</i>)	809,854.70	9,074,391.73	27.00	9.00
21	6	Kemiri (<i>Aleurites moluccana</i>)	809,845.60	9,074,377.38	24.00	9.00
21	7	Kemiri (<i>Aleurites moluccana</i>)	809,849.95	9,074,378.55	59.00	10.00
21	8	Kemiri (<i>Aleurites moluccana</i>)	809,856.71	9,074,380.36	30.00	9.00
21	9	Kemiri (<i>Aleurites moluccana</i>)	809,861.54	9,074,381.65	33.00	5.00
21	10	Kemiri (<i>Aleurites moluccana</i>)	809,858.33	9,074,370.44	25.00	9.00
21	11	Kemiri (<i>Aleurites moluccana</i>)	809,856.16	9,074,355.36	31.00	8.00
21	12	Kemiri (<i>Aleurites moluccana</i>)	809,863.28	9,074,357.79	29.00	7.00
21	13	Kemiri (<i>Aleurites moluccana</i>)	809,867.85	9,074,360.05	28.00	8.00
21	14	Kedawung (<i>Parkia timoriana</i>)	809,866.65	9,074,337.47	20.00	9.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
22	1	Gedangan (<i>Corchorus acutangulus</i>)	817,382.19	9,073,163.72	50.00	12.00
22	2	Besole (<i>Chydenanthus ecelcus</i>)	817,380.43	9,073,167.35	23.00	15.00
22	3	Besole (<i>Chydenanthus ecelcus</i>)	817,378.78	9,073,168.06	25.00	15.00
22	4	Besole (<i>Chydenanthus ecelcus</i>)	817,373.12	9,073,170.35	27.00	11.00
22	5	Pakem (<i>Pangium edule</i>)	817,370.00	9,073,176.07	32.00	19.00
22	6	Besole (<i>Chydenanthus ecelcus</i>)	817,350.05	9,073,189.35	52.00	13.00
22	7	Besole (<i>Chydenanthus ecelcus</i>)	817,348.94	9,073,201.15	27.00	16.00
22	8	Besole (<i>Chydenanthus ecelcus</i>)	817,356.24	9,073,208.28	30.00	15.00
22	9	Glintungan (<i>Bischofia javanica</i>)	817,343.52	9,073,211.34	200.00	40.00
22	10	Besole (<i>Chydenanthus ecelcus</i>)	817,342.93	9,073,208.58	27.00	13.00
22	11	Besole (<i>Chydenanthus ecelcus</i>)	817,350.82	9,073,218.47	22.00	16.00
22	12	Bangsai	817,349.29	9,073,218.07	20.00	13.00
22	13	Sentul (<i>Sondaricum koetjapi</i>)	817,339.56	9,073,216.52	33.00	20.00
22	14	Besole (<i>Chydenanthus ecelcus</i>)	817,338.54	9,073,223.61	22.00	14.00
22	15	Besole (<i>Chydenanthus ecelcus</i>)	817,330.36	9,073,224.26	20.00	14.00
22	16	Besole (<i>Chydenanthus ecelcus</i>)	817,326.44	9,073,233.04	35.00	19.00
22	17	Pakem (<i>Pangium edule</i>)	817,331.62	9,073,237.00	34.00	30.00
22	18	Besole (<i>Chydenanthus ecelcus</i>)	817,322.55	9,073,243.63	39.00	16.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
23	1	Ringin Putih (<i>Ficus benjamina</i> var. <i>varigata</i>)	822,146.96	9,069,608.12	51.00	22.00
23	2	Ringin Putih (<i>Ficus benjamina</i> var. <i>varigata</i>)	822,144.41	9,069,606.53	52.00	29.00
23	3	Dandang Gulo (<i>Mischocarpus sundaicus</i>)	822,144.73	9,069,607.91	24.00	17.00
23	4	Tutup (<i>Mallotus moluccanus</i>)	822,149.87	9,069,594.02	42.00	22.00
23	5	Lutung (<i>Maba hermaphroditica</i>)	822,138.48	9,069,598.10	25.00	12.00
23	6	Kendaraan (<i>Myristica teysmanii</i>)	822,132.12	9,069,603.56	21.00	13.00
23	7	Pakem (<i>Pangium edule</i>)	822,140.07	9,069,590.84	38.00	15.00
23	8	Glindungan (<i>Bischofia javanica</i>)	822,134.40	9,069,586.71	37.00	25.00
23	9	Pluncing (<i>Spondias pinnata</i>)	822,131.48	9,069,586.66	70.00	27.00
23	10	Berasan (<i>Gomphia serrata</i>)	822,129.25	9,069,591.16	23.00	29.00
23	11	Suren (<i>Toona sureni</i>)	822,126.92	9,069,592.06	41.00	31.00
23	12	Kemadu (<i>Laportea sinuata</i>)	822,122.68	9,069,594.13	50.00	12.00
23	13	Berasan (<i>Gomphia serrata</i>)	822,124.59	9,069,578.81	29.00	16.00
23	14	Ledoyo (<i>Dysoxylum amoroides</i>)	822,112.40	9,069,579.45	21.00	19.00
23	15	Garu (<i>Antidesma montanum</i>)	822,108.37	9,069,579.29	49.00	24.00
23	16	Sapen (<i>Pometia tomentosa</i>)	822,105.09	9,069,585.49	24.00	16.00
23	17	Wali Angin (<i>Mallotus paniculatus</i>)	822,106.67	9,069,568.80	22.00	19.00
23	18	Berasan (<i>Gomphia serrata</i>)	822,105.72	9,069,569.38	22.00	15.00
23	19	Suren (<i>Toona sureni</i>)	822,101.80	9,069,572.83	70.00	32.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
23	20	Berasan (<i>Gomphia serrata</i>)	822,097.77	9,069,577.39	20.00	23.00
23	21	Berasan (<i>Gomphia serrata</i>)	822,096.39	9,069,577.70	23.00	26.00
23	22	Lutung (<i>Maba hermaphroditica</i>)	822,097.72	9,069,580.30	20.00	22.00
23	23	Lutung (<i>Maba hermaphroditica</i>)	822,085.42	9,069,558.47	40.00	31.00
23	24	Krangean (<i>Litsea cubeba</i>)	822,088.34	9,069,572.67	50.00	42.00
23	25	Berasan (<i>Gomphia serrata</i>)	822,082.82	9,069,559.79	22.00	15.00
23	26	Berasan (<i>Gomphia serrata</i>)	822,071.38	9,069,562.07	21.00	17.00
23	27	Dandang Gulo (<i>Mischocarpus sundaicus</i>)	822,077.95	9,069,554.39	20.00	17.00
24	1	Putat (<i>Planchonia valida</i>)	821,423.04	9,068,652.54	53.00	29.00
24	2	Berasan (<i>Gomphia serrata</i>)	821,421.92	9,068,653.95	21.00	12.00
24	3	Sentul (<i>Sondaricum koetjapi</i>)	821,421.22	9,068,661.92	32.00	24.00
24	4	Ambaluan (<i>Dysoxylum acutangulum</i>)	821,418.74	9,068,650.16	22.00	15.00
24	5	Putat (<i>Planchonia valida</i>)	821,420.33	9,068,666.36	32.00	17.00
24	6	Sentul Merah (<i>Sandorium, sp</i>)	821,417.78	9,068,661.12	40.00	17.00
24	7	Rau (<i>Dracontomelon mangiferum</i>)	821,417.25	9,068,667.09	42.00	22.00
24	8	Lutung (<i>Maba hermaphroditica</i>)	821,413.17	9,068,650.68	60.00	22.00
24	9	Lutung (<i>Maba hermaphroditica</i>)	821,413.57	9,068,663.26	80.00	25.00
24	10	Garu (<i>Antidesma montanum</i>)	821,412.62	9,068,662.67	22.00	20.00
24	11	Berasan (<i>Gomphia serrata</i>)	821,407.55	9,068,663.23	20.00	15.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
24	12	Sapen (<i>Pometia tomentosa</i>)	821,404.70	9,068,649.93	24.00	10.00
24	13	Bayur (<i>Pterospermum diversifolium</i>)	821,403.38	9,068,659.36	24.00	16.00
24	14	Berasan (<i>Gomphia serrata</i>)	821,400.78	9,068,654.61	20.00	14.00
24	15	Bayur (<i>Pterospermum diversifolium</i>)	821,393.69	9,068,661.02	23.00	15.00
24	16	Sentul Putih (<i>Sandorium, sp</i>)	821,392.01	9,068,657.36	51.00	29.00
24	17	Talesan (<i>Persea odoratissima</i>)	821,391.64	9,068,655.82	21.00	15.00
24	18	Berasan (<i>Gomphia serrata</i>)	821,389.06	9,068,656.60	20.00	12.00
24	19	Pacar (<i>Aglaia odorata</i>)	821,381.07	9,068,650.38	56.00	31.00
24	20	Kendaraan (<i>Myristica teysmanii</i>)	821,381.83	9,068,658.98	40.00	30.00
24	21	Talesan (<i>Persea odoratissima</i>)	821,371.69	9,068,660.10	25.00	22.00
24	22	Wali Angin (<i>Mallotus paniculatus</i>)	821,371.47	9,068,662.59	22.00	25.00
24	23	Wali Angin (<i>Mallotus paniculatus</i>)	821,370.66	9,068,648.96	30.00	20.00
24	24	Sentul Merah (<i>Sandorium, sp</i>)	821,368.32	9,068,652.77	50.00	20.00
24	25	Awu-awu	821,357.49	9,068,650.32	20.00	12.00
24	26	Putihan (<i>Acronychia trifoliata</i>)	821,356.36	9,068,651.73	31.00	12.00
24	27	Garu (<i>Antidesma montanum</i>)	821,349.47	9,068,650.12	22.00	20.00
24	28	Berasan (<i>Gomphia serrata</i>)	821,352.27	9,068,646.85	23.00	15.00
24	29	Sentul Putih (<i>Sandorium sp</i>)	821,347.33	9,068,657.46	60.00	29.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
24	30	Berasan (<i>Gomphia serrata</i>)	821,349.91	9,068,645.14	22.00	15.00
24	31	Sentul Merah (<i>Sandorium sp</i>)	821,342.40	9,068,644.99	23.00	13.00
24	32	Putat (<i>Planchonia valida</i>)	821,342.22	9,068,646.98	20.00	13.00
24	33	Gondang (<i>Ficus variegata</i>)	821,333.71	9,068,646.74	22.00	13.00
24	34	Berasan (<i>Gomphia serrata</i>)	821,332.02	9,068,654.62	23.00	12.00
24	35	Joho (<i>Terminalia belerica</i>)	821,328.72	9,068,657.84	60.00	31.00
24	36	Berasan (<i>Gomphia serrata</i>)	821,329.94	9,068,643.90	22.00	12.00
25	1	Apak (<i>Ficus benjamina</i>)	819,214.68	9,068,038.31	51.00	21.00
25	2	Berasan (<i>Gomphia serrata</i>)	819,209.25	9,068,049.42	21.00	12.00
25	3	Pacar (<i>Aglaia odorata</i>)	819,210.79	9,068,034.93	32.00	31.00
25	4	Dandang Gulo (<i>Mischocarpus sundaicus</i>)	819,201.53	9,068,047.27	40.00	26.00
25	5	Pacar (<i>Aglaia odorata</i>)	819,198.92	9,068,035.47	60.00	28.00
25	6	Dandang Gulo (<i>Mischocarpus sundaicus</i>)	819,191.54	9,068,046.17	32.00	17.00
25	7	Sentul Putih (<i>Sandorium sp</i>)	819,190.89	9,068,034.79	42.00	26.00
25	8	Berasan (<i>Gomphia serrata</i>)	819,190.43	9,068,032.13	24.00	12.00
25	9	Berasan (<i>Gomphia serrata</i>)	819,180.93	9,068,031.14	23.00	11.00
25	10	Berasan (<i>Gomphia serrata</i>)	819,179.64	9,068,032.39	23.00	16.00
25	11	Awal/Aben	819,176.17	9,068,043.92	32.00	21.00
25	12	Sapen (<i>Pometia tomentosa</i>)	819,176.44	9,068,037.85	42.00	25.00
25	13	Sentul Merah (<i>Sandorium sp</i>)	819,168.62	9,068,043.34	49.00	21.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
25	14	Kasuran (<i>Isachne globosa</i>)	819,169.92	9,068,025.22	22.00	23.00
25	15	Dandang Gulo (<i>Mischocarpus sundaicus</i>)	819,157.69	9,068,039.49	20.00	13.00
25	16	Sentul Putih (<i>Sandorium sp</i>)	819,149.30	9,068,035.66	29.00	20.00
25	17	Sapen (<i>Pometia tomentosa</i>)	819,150.19	9,068,026.65	43.00	31.00
25	18	Sentul Merah (<i>Sandorium sp</i>)	819,145.41	9,068,025.12	29.00	17.00
25	19	Wali Angin (<i>Mallotus paniculatus</i>)	819,142.19	9,068,023.41	21.00	13.00
25	20	Pacar (<i>Aglaia odorata</i>)	819,140.60	9,068,033.30	22.00	23.00
25	21	Sapen (<i>Pometia tomentosa</i>)	819,128.23	9,068,026.58	60.00	17.00
25	22	Kemadu (<i>Laportea sinuata</i>)	819,119.75	9,068,030.40	22.00	21.00
26	1	Sentul Merah (<i>Sandorium sp</i>)	818,035.82	9,068,573.60	40.00	22.00
26	2	Apak (<i>Ficus benjamina</i>)	818,038.29	9,068,576.07	50.00	20.00
26	3	Berasan (<i>Gomphia serrata</i>)	818,049.61	9,068,571.12	25.00	16.00
26	4	Joho (<i>Terminalia belerica</i>)	818,050.31	9,068,570.41	48.00	31.00
26	5	Talesan (<i>Persea odoratissima</i>)	818,055.26	9,068,579.61	50.00	27.00
26	6	Jumplong	818,061.98	9,068,585.62	20.00	13.00
26	7	Kasan	818,063.40	9,068,596.93	22.00	15.00
26	8	Nyampuh (<i>Litsea monopetala</i>)	818,072.59	9,068,595.52	25.00	22.00
26	9	Kasan	818,075.06	9,068,593.75	21.00	12.00
26	10	Talesan (<i>Persea odoratissima</i>)	818,074.36	9,068,602.23	32.00	25.00
26	11	Sentul (<i>Sondaricum koetjapi</i>)	818,077.89	9,068,596.58	25.00	23.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
26	12	Joho (<i>Terminalia belerica</i>)	818,084.61	9,068,602.59	40.00	25.00
26	13	Putihan (<i>Acronychia trifoliata</i>)	818,086.73	9,068,604.71	20.00	13.00
26	14	Nongkoan (<i>Ficus fulva</i>)	818,083.90	9,068,611.07	25.00	17.00
26	15	Joho (<i>Terminalia belerica</i>)	818,089.56	9,068,613.90	45.00	29.00
26	16	Putihan (<i>Acronychia trifoliata</i>)	818,091.68	9,068,611.78	27.00	16.00
26	17	Jambuan (<i>Eugenia densiflora</i>)	818,095.92	9,068,616.02	25.00	15.00
26	18	Sentul Merah (<i>Sandorium sp</i>)	818,101.58	9,068,621.68	27.00	21.00
26	19	Ambaluan (<i>Dysoxylum acutangulum</i>)	818,095.92	9,068,628.75	22.00	13.00
26	20	Ambaluan (<i>Dysoxylum acutangulum</i>)	818,094.51	9,068,629.46	21.00	14.00
26	21	Nyampuh (<i>Litsea monopetala</i>)	818,099.46	9,068,628.04	25.00	17.00
26	22	Kawung (<i>Arenga pinnata</i>)	818,097.69	9,068,631.23	22.00	13.00
26	23	Wali Angin (<i>Mallotus paniculatus</i>)	818,097.69	9,068,633.35	20.00	14.00
26	24	Sentul Merah (<i>Sandorium sp</i>)	818,101.58	9,068,637.24	40.00	22.00
26	25	Talesan (<i>Persea odoratissima</i>)	818,107.24	9,068,635.11	30.00	17.00
26	26	Ambaluan (<i>Dysoxylum acutangulum</i>)	818,109.71	9,068,632.64	27.00	15.00
26	27	Nyampuh (<i>Litsea monopetala</i>)	818,103.35	9,068,640.42	30.00	12.00
26	28	Kasan	818,102.99	9,068,644.31	20.00	15.00
27	1	Besole (<i>Chydenanthus ecelcus</i>)	799,369.00	9,067,212.00	56.00	14.00
27	2	Besole (<i>Chydenanthus ecelcus</i>)	799,387.97	9,067,210.86	40.00	14.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
27	3	Bungur (<i>Lagerstroemia speciosa</i>)	799,389.70	9,067,209.86	78.00	17.00
27	4	Talesan (<i>Persea odoratissima</i>)	799,389.94	9,067,206.26	47.00	15.00
27	5	Bendo (<i>Artocarpus elasticus</i>)	799,391.35	9,067,203.71	49.00	22.00
27	6	Besole (<i>Chydenanthus ecelcus</i>)	799,400.71	9,067,202.93	89.00	18.00
27	7	Durenan (<i>Durio zibethinus</i>)	799,411.14	9,067,189.98	34.00	9.00
27	8	Sepat (<i>Litsea umbellata</i>)	799,412.37	9,067,188.12	86.00	30.00
27	9	Besole (<i>Chydenanthus ecelcus</i>)	799,412.17	9,067,184.77	78.00	14.00
27	10	Kecapi (<i>Sandoricum koetjapi</i>)	799,416.70	9,067,185.62	25.00	7.00
27	11	Besole (<i>Chydenanthus ecelcus</i>)	799,422.93	9,067,192.41	33.00	15.00
27	12	Kecapi (<i>Sandoricum koetjapi</i>)	799,421.36	9,067,188.70	22.00	11.00
27	13	Berasan (<i>Gomphia serrata</i>)	799,423.63	9,067,181.62	32.00	17.00
27	14	Durenan (<i>Durio zibethinus</i>)	799,432.35	9,067,177.73	34.00	20.00
27	15	Durenan (<i>Durio zibethinus</i>)	799,428.80	9,067,174.58	25.00	13.00
27	16	Pluncing (<i>Spondias pinnata</i>)	799,435.57	9,067,175.30	95.00	35.00
27	17	Kempol kethek (<i>Lophopetalum javanicum</i>)	799,433.87	9,067,169.35	21.00	10.00
27	18	Besole (<i>Chydenanthus ecelcus</i>)	799,436.17	9,067,170.33	26.00	15.00
27	19	Besole (<i>Chydenanthus ecelcus</i>)	799,440.08	9,067,172.12	32.00	18.00
27	20	Medang (<i>Litsea amara</i> Blume)	799,442.25	9,067,170.87	34.00	22.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
27	21	Kempol kethek (<i>Lophopetalum javanicum</i>)	799,441.98	9,067,166.40	23.00	12.00
27	22	Besole (<i>Chydenanthus ecelcus</i>)	799,449.31	9,067,169.10	68.00	21.00
27	23	Durenan (<i>Durio zibethinus</i>)	799,449.63	9,067,170.65	32.00	17.00
27	24	Bendo (<i>Artocarpus elasticus</i>)	799,449.74	9,067,168.85	89.00	23.00
27	25	Berasan (<i>Gomphia serrata</i>)	799,451.50	9,067,160.90	35.00	15.00
28	1	Besole (<i>Chydenanthus ecelcus</i>)	803,830.00	9,068,693.50	46.00	12.00
28	2	Nyatoh (<i>Palaquium sp</i>)	803,820.00	9,068,692.50	48.00	14.00
28	3	Manting (<i>Euginea polyanthum</i>)	803,821.00	9,068,690.50	41.00	13.00
28	4	Keningar (<i>Cynamomum aromaticum</i>)	803,821.50	9,068,677.00	21.00	9.00
28	5	Besole (<i>Chydenanthus ecelcus</i>)	803,830.00	9,068,679.50	48.00	11.00
28	6	Glindungan (<i>Bischofia javanica</i>)	803,824.50	9,068,673.00	23.00	11.00
28	7	Glindungan (<i>Bischofia javanica</i>)	803,829.00	9,068,671.50	76.00	17.00
28	8	Sriwil kutil (<i>Sterculia campanulata</i>)	803,833.00	9,068,666.50	42.00	22.00
28	9	Poh-pohan (<i>Pilea Trinervia</i>)	803,823.50	9,068,662.00	25.00	15.00
28	10	Tutup (<i>Mallotus moluccanus</i>)	803,818.00	9,068,656.00	21.00	13.00
28	11	Sriwil kutil (<i>Sterculia campanulata</i>)	803,831.00	9,068,656.00	25.00	15.00
28	12	Rau (<i>Dracontomelon mangiferum</i>)	803,830.50	9,068,660.50	20.00	13.00
28	13	Besole (<i>Chydenanthus ecelcus</i>)	803,823.00	9,068,634.00	52.00	12.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
28	14	Bendo (<i>Artocarpus elasticus</i>)	803,823.00	9,068,630.00	64.00	14.00
28	15	Sriwil kutil (<i>Sterculia campanulata</i>)	803,829.50	9,068,630.00	39.00	16.00
28	16	Gondang (<i>Ficus variegata</i>)	803,819.50	9,068,622.50	33.00	14.00
28	17	Bendo (<i>Artocarpus elasticus</i>)	803,817.00	9,068,623.00	30.00	15.00
28	18	Berasan (<i>Gomphia serrata</i>)	803,824.50	9,068,613.50	64.00	15.00
28	19	Bendo (<i>Artocarpus elasticus</i>)	803,823.00	9,068,604.50	63.00	17.00
29	1	Sriwil kutil (<i>Sterculia campanulata</i>)	802,312.50	9,067,504.00	20.00	10.00
29	2	Sriwil kutil (<i>Sterculia campanulata</i>)	802,315.50	9,067,505.00	25.00	11.00
29	3	Sriwil kutil (<i>Sterculia campanulata</i>)	802,321.00	9,067,498.50	21.00	16.00
29	4	Pulai (<i>Alstonia scholaris</i>)	802,322.50	9,067,498.00	20.00	12.00
29	5	Rau (<i>Dracontomelon mangiferum</i>)	802,341.00	9,067,503.50	36.00	12.00
29	6	Kecapi (<i>Sandoricum koetjape</i>)	802,363.50	9,067,512.50	28.00	13.00
29	7	Glingsan	802,373.00	9,067,514.00	23.00	4.00
29	8	Glintungan (<i>Bischofia javanica</i>)	802,390.00	9,067,504.50	174.00	23.00
29	9	Apak (<i>Ficus benjamina</i>)	802,390.50	9,067,503.50	87.00	27.00
30	1	Besole (<i>Chydenanthus ecelcus</i>)	802,330.83	9,064,621.37	24.00	13.00
30	2	Bendo (<i>Artocarpus elasticus</i>)	802,328.25	9,064,626.90	56.00	21.00
30	3	Besole (<i>Chydenanthus ecelcus</i>)	802,320.39	9,064,630.28	142.00	11.00
30	4	Kemadu (<i>Laportea sinuata</i>)	802,327.10	9,064,633.91	29.00	10.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
30	5	Besole (<i>Chydenanthus ecelcus</i>)	802,336.20	9,064,628.66	76.00	19.00
30	6	Sriwil Kutil (<i>Sterculia campanulata</i>)	802,331.04	9,064,639.72	76.00	22.00
30	7	Glindungan (<i>Bischofia javanica</i>)	802,335.15	9,064,644.85	92.00	24.00
30	8	Bindung (<i>Tetrameles nudiflora</i>)	802,342.03	9,064,643.77	33.00	13.00
30	9	Bayur (<i>Pterospermum diversifolium</i>)	802,349.56	9,064,649.81	34.00	27.00
30	10	Glindungan (<i>Bischofia javanica</i>)	802,351.66	9,064,647.44	31.00	17.00
30	11	Timo (<i>Kleinhovia hospita</i>)	802,345.46	9,064,648.71	36.00	12.00
30	12	Glindungan (<i>Bischofia javanica</i>)	802,334.75	9,064,653.16	43.00	14.00
30	13	Gondang (<i>Ficus variegata</i>)	802,347.04	9,064,667.44	59.00	19.00
30	14	Rau (<i>Dracontomelon mangiferum</i>)	802,348.42	9,064,671.83	20.00	13.00
30	15	Timo (<i>Kleinhovia hospita</i>)	802,359.15	9,064,671.41	32.00	10.00
30	16	Kemadu (<i>Laportea sinuata</i>)	802,363.25	9,064,672.51	27.00	9.00
30	17	Pluncing (<i>Spondias pinnata</i>)	802,359.63	9,064,683.26	57.00	23.00
30	18	Serut (<i>Streblus asper</i>)	802,359.92	9,064,691.75	24.00	7.00
30	19	Ketangi (<i>Lagerstroemia spceiosa</i>)	802,370.26	9,064,688.67	23.00	12.00
30	20	Timo (<i>Kleinhovia hospita</i>)	802,375.48	9,064,704.71	25.00	12.00
31	1	Karet (<i>Hevea brasiliensis</i>)	802,063.76	9,063,598.08	29.00	12.00
31	2	Karet (<i>Hevea brasiliensis</i>)	802,065.37	9,063,600.00	29.00	12.00
31	3	Karet (<i>Hevea brasiliensis</i>)	802,067.94	9,063,603.06	27.00	11.00
31	4	Karet (<i>Hevea brasiliensis</i>)	802,065.02	9,063,591.81	25.00	13.00
31	5	Karet (<i>Hevea brasiliensis</i>)	802,067.27	9,063,594.49	38.00	16.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
31	6	Karet (<i>Hevea brasiliensis</i>)	802,069.20	9,063,596.79	31.00	15.00
31	7	Karet (<i>Hevea brasiliensis</i>)	802,071.45	9,063,599.47	33.00	14.00
31	8	Karet (<i>Hevea brasiliensis</i>)	802,071.21	9,063,585.96	31.00	13.00
31	9	Karet (<i>Hevea brasiliensis</i>)	802,068.64	9,063,582.90	30.00	12.00
31	10	Karet (<i>Hevea brasiliensis</i>)	802,066.07	9,063,579.83	31.00	11.00
31	11	Karet (<i>Hevea brasiliensis</i>)	802,077.31	9,063,593.24	38.00	13.00
31	12	Karet (<i>Hevea brasiliensis</i>)	802,081.85	9,063,590.08	41.00	12.00
31	13	Karet (<i>Hevea brasiliensis</i>)	802,079.60	9,063,587.40	33.00	11.00
31	14	Karet (<i>Hevea brasiliensis</i>)	802,077.35	9,063,584.72	39.00	14.00
31	15	Karet (<i>Hevea brasiliensis</i>)	802,075.80	9,063,582.10	34.00	12.00
31	16	Karet (<i>Hevea brasiliensis</i>)	802,072.59	9,063,578.27	32.00	14.00
31	17	Karet (<i>Hevea brasiliensis</i>)	802,070.66	9,063,575.97	36.00	14.00
31	18	Karet (<i>Hevea brasiliensis</i>)	802,076.35	9,063,571.86	37.00	14.00
31	19	Karet (<i>Hevea brasiliensis</i>)	802,078.60	9,063,574.54	34.00	14.00
31	20	Karet (<i>Hevea brasiliensis</i>)	802,082.39	9,063,579.84	47.00	15.00
31	21	Karet (<i>Hevea brasiliensis</i>)	802,084.38	9,063,581.43	34.00	15.00
31	22	Karet (<i>Hevea brasiliensis</i>)	802,086.63	9,063,584.11	43.00	16.00
31	23	Karet (<i>Hevea brasiliensis</i>)	802,088.94	9,063,586.09	39.00	14.00
31	24	Karet (<i>Hevea brasiliensis</i>)	802,094.75	9,063,580.57	33.00	12.00
31	25	Karet (<i>Hevea brasiliensis</i>)	802,092.18	9,063,577.50	41.00	14.00
31	26	Karet (<i>Hevea brasiliensis</i>)	802,089.93	9,063,574.82	42.00	17.00
31	27	Karet (<i>Hevea brasiliensis</i>)	802,087.36	9,063,571.76	28.00	16.00
31	28	Karet (<i>Hevea brasiliensis</i>)	802,085.75	9,063,569.84	35.00	17.00
31	29	Karet (<i>Hevea brasiliensis</i>)	802,083.82	9,063,567.54	36.00	16.00
31	30	Karet (<i>Hevea brasiliensis</i>)	802,082.21	9,063,565.63	38.00	18.00
31	31	Karet (<i>Hevea brasiliensis</i>)	802,090.59	9,063,563.17	46.00	18.00
31	32	Karet (<i>Hevea brasiliensis</i>)	802,093.81	9,063,567.00	39.00	17.00
31	33	Karet (<i>Hevea brasiliensis</i>)	802,096.70	9,063,570.44	38.00	17.00
31	34	Karet (<i>Hevea brasiliensis</i>)	802,100.23	9,063,574.66	47.00	18.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
31	35	Karet (<i>Hevea brasiliensis</i>)	802,106.56	9,063,571.31	34.00	18.00
31	36	Karet (<i>Hevea brasiliensis</i>)	802,104.63	9,063,569.01	37.00	13.00
31	37	Karet (<i>Hevea brasiliensis</i>)	802,102.70	9,063,566.71	28.00	12.00
31	38	Karet (<i>Hevea brasiliensis</i>)	802,100.78	9,063,564.41	34.00	15.00
31	39	Karet (<i>Hevea brasiliensis</i>)	802,098.53	9,063,561.73	36.00	13.00
31	40	Karet (<i>Hevea brasiliensis</i>)	802,097.24	9,063,560.20	41.00	17.00
31	42	Karet (<i>Hevea brasiliensis</i>)	802,095.63	9,063,558.28	31.00	13.00
31	43	Karet (<i>Hevea brasiliensis</i>)	802,094.67	9,063,557.14	39.00	18.00
31	44	Karet (<i>Hevea brasiliensis</i>)	802,098.18	9,063,553.54	37.00	12.00
31	45	Karet (<i>Hevea brasiliensis</i>)	802,100.75	9,063,556.60	28.00	13.00
31	46	Karet (<i>Hevea brasiliensis</i>)	802,102.68	9,063,558.90	31.00	13.00
31	47	Karet (<i>Hevea brasiliensis</i>)	802,103.96	9,063,560.43	33.00	13.00
31	48	Karet (<i>Hevea brasiliensis</i>)	802,106.53	9,063,563.50	29.00	13.00
31	49	Karet (<i>Hevea brasiliensis</i>)	802,109.10	9,063,566.56	34.00	17.00
31	50	Karet (<i>Hevea brasiliensis</i>)	802,112.29	9,063,562.58	33.00	12.00
31	51	Karet (<i>Hevea brasiliensis</i>)	802,109.40	9,063,559.13	35.00	15.00
31	52	Karet (<i>Hevea brasiliensis</i>)	802,107.79	9,063,557.22	23.00	14.00
31	53	Karet (<i>Hevea brasiliensis</i>)	802,105.86	9,063,554.92	35.00	14.00
31	54	Karet (<i>Hevea brasiliensis</i>)	802,103.61	9,063,552.24	36.00	15.00
31	55	Karet (<i>Hevea brasiliensis</i>)	802,101.69	9,063,549.94	43.00	16.00
31	56	Karet (<i>Hevea brasiliensis</i>)	802,106.80	9,063,548.26	24.00	17.00
31	57	Karet (<i>Hevea brasiliensis</i>)	802,110.34	9,063,552.47	28.00	18.00
31	58	Karet (<i>Hevea brasiliensis</i>)	802,114.26	9,063,556.36	28.00	12.00
31	59	Karet (<i>Hevea brasiliensis</i>)	802,116.83	9,063,559.43	29.00	11.00
31	60	Karet (<i>Hevea brasiliensis</i>)	802,118.43	9,063,561.34	27.00	13.00
31	61	Karet (<i>Hevea brasiliensis</i>)	802,124.95	9,063,555.88	24.00	13.00
31	62	Karet (<i>Hevea brasiliensis</i>)	802,123.34	9,063,553.97	36.00	12.00
31	63	Karet (<i>Hevea brasiliensis</i>)	802,121.73	9,063,552.05	28.00	12.00
31	64	Karet (<i>Hevea brasiliensis</i>)	802,120.12	9,063,550.13	26.00	12.00
31	65	Karet (<i>Hevea brasiliensis</i>)	802,116.91	9,063,546.30	32.00	11.00
31	66	Karet (<i>Hevea brasiliensis</i>)	802,114.66	9,063,543.62	37.00	17.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
31	67	Karet (<i>Hevea brasiliensis</i>)	802,112.73	9,063,541.33	42.00	15.00
31	68	Karet (<i>Hevea brasiliensis</i>)	802,123.09	9,063,536.55	38.00	15.00
31	69	Karet (<i>Hevea brasiliensis</i>)	802,125.66	9,063,539.62	33.00	12.00
31	70	Karet (<i>Hevea brasiliensis</i>)	802,129.52	9,063,544.21	30.00	12.00
31	71	Karet (<i>Hevea brasiliensis</i>)	802,131.76	9,063,546.89	29.00	15.00
31	72	Karet (<i>Hevea brasiliensis</i>)	802,137.13	9,063,542.39	31.00	13.00
31	73	Karet (<i>Hevea brasiliensis</i>)	802,134.23	9,063,538.95	33.00	15.00
31	74	Karet (<i>Hevea brasiliensis</i>)	802,130.70	9,063,534.73	31.00	15.00
31	75	Karet (<i>Hevea brasiliensis</i>)	802,128.13	9,063,531.67	29.00	14.00
31	76	Karet (<i>Hevea brasiliensis</i>)	802,126.20	9,063,529.37	27.00	12.00
32	1	Sonokeling (<i>Paraserianthes falcataria</i>)	799,066.91	9,061,479.01	60.00	15.00
32	2	Segawe (<i>Adenanthera pavonina</i>)	799,062.81	9,061,472.73	33.00	16.00
32	3	Segawe (<i>Adenanthera pavonina</i>)	799,062.81	9,061,472.73	22.00	9.00
32	4	Segawe (<i>Adenanthera pavonina</i>)	799,062.81	9,061,472.73	33.00	14.00
32	5	Segawe (<i>Adenanthera pavonina</i>)	799,062.81	9,061,472.73	27.00	9.00
32	6	Segawe (<i>Adenanthera pavonina</i>)	799,062.81	9,061,472.73	76.00	14.00
32	7	Segawe (<i>Adenanthera pavonina</i>)	799,062.81	9,061,472.73	26.00	4.50
32	8	Tancang (<i>Bruguera sexangula</i>)	799,060.72	9,061,462.39	40.00	16.00
32	9	Tancang (<i>Bruguera sexangula</i>)	799,059.48	9,061,461.41	24.00	11.00
32	10	Tancang (<i>Bruguera sexangula</i>)	799,057.26	9,061,455.81	48.00	15.00
32	11	Tancang (<i>Bruguera sexangula</i>)	799,056.02	9,061,454.83	35.00	8.00
32	12	Tancang (<i>Bruguera sexangula</i>)	799,060.55	9,061,457.01	48.00	14.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
32	13	Tancang (<i>Bruguera sexangula</i>)	799,060.55	9,061,457.01	39.00	13.00
32	14	Waru (<i>Hibiscus tiliaceus</i>)	799,064.18	9,061,457.27	34.00	9.00
32	15	X1	799,068.41	9,061,458.81	20.00	6.00
32	16	<i>Soneratia sp</i>	799,057.56	9,061,450.60	44.00	16.00
32	17	<i>Soneratia sp</i>	799,057.56	9,061,450.60	30.00	10.00
32	18	<i>Soneratia sp</i>	799,057.01	9,061,447.74	25.00	8.00
32	19	<i>Soneratia sp</i>	799,058.46	9,061,446.67	40.00	11.00
32	20	<i>Soneratia sp</i>	799,060.68	9,061,446.42	27.00	7.00
32	21	<i>Soneratia sp</i>	799,062.56	9,061,447.10	25.00	8.00
32	22	<i>Soneratia sp</i>	799,064.57	9,061,448.89	41.00	7.00
32	23	<i>Soneratia sp</i>	799,064.57	9,061,448.89	36.00	14.00
32	24	<i>Soneratia sp</i>	799,064.57	9,061,448.89	35.00	12.00
32	25	<i>Soneratia sp</i>	799,067.52	9,061,451.03	28.00	7.00
32	26	Waru (<i>Hibiscus tiliaceus</i>)	799,071.40	9,061,453.51	21.00	10.00
32	27	<i>Soneratia sp</i>	799,070.04	9,061,451.42	68.00	5.00
32	28	<i>Soneratia sp</i>	799,069.70	9,061,446.50	25.00	2.00
32	29	<i>Soneratia sp</i>	799,077.73	9,061,447.83	41.00	12.00
32	30	<i>Soneratia sp</i>	799,076.32	9,061,417.32	48.00	11.00
32	31	<i>Soneratia sp</i>	799,067.61	9,061,436.16	27.00	8.00
32	32	<i>Soneratia sp</i>	799,074.14	9,061,440.14	21.00	7.00
32	33	<i>Soneratia sp</i>	799,074.40	9,061,436.51	22.00	6.00
32	34	<i>Soneratia sp</i>	799,070.38	9,061,432.92	20.00	5.00
32	35	<i>Soneratia sp</i>	799,075.94	9,061,432.28	21.00	7.00
32	36	Tancang (<i>Bruguera sexangula</i>)	799,078.54	9,061,429.50	33.00	4.00
32	37	Tancang (<i>Bruguera sexangula</i>)	799,077.82	9,061,427.11	27.00	8.00
32	38	Tancang (<i>Bruguera sexangula</i>)	799,079.19	9,061,423.35	21.00	5.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
32	39	Tancang (<i>Bruguera sexangula</i>)	799,083.42	9,061,424.89	31.00	12.00
32	40	Tancang (<i>Bruguera sexangula</i>)	799,080.60	9,061,418.01	26.00	6.00
32	41	Tancang (<i>Bruguera sexangula</i>)	799,083.76	9,061,418.10	31.00	6.00
32	42	Tancang (<i>Bruguera sexangula</i>)	799,077.91	9,061,412.25	31.00	10.00
32	43	Tancang (<i>Bruguera sexangula</i>)	799,084.70	9,061,412.59	36.00	11.00
32	44	Tancang (<i>Bruguera sexangula</i>)	799,086.28	9,061,412.63	32.00	11.00
32	45	Tancang (<i>Bruguera sexangula</i>)	799,077.70	9,061,408.44	20.00	5.00
32	46	Tancang (<i>Bruguera sexangula</i>)	799,074.06	9,061,408.19	26.00	9.00
32	47	Tancang (<i>Bruguera sexangula</i>)	799,088.12	9,061,403.19	22.00	7.00
32	48	Tancang (<i>Bruguera sexangula</i>)	799,093.08	9,061,395.42	26.00	12.00
32	49	Tancang (<i>Bruguera sexangula</i>)	799,093.08	9,061,395.42	29.00	11.00
32	50	Tancang (<i>Bruguera sexangula</i>)	799,093.08	9,061,395.42	35.00	11.00
32	51	Tancang (<i>Bruguera sexangula</i>)	799,093.08	9,061,395.42	25.00	12.00
32	52	Tancang (<i>Bruguera sexangula</i>)	799,093.08	9,061,395.42	30.00	10.00
32	53	Tancang (<i>Bruguera sexangula</i>)	799,092.40	9,061,391.45	36.00	11.00
32	54	Tancang (<i>Bruguera sexangula</i>)	799,086.16	9,061,388.11	35.00	11.00
33	1	Sentul (<i>Sandoricum koetjape</i>)	802,086.50	9,061,743.45	26.00	15.00
33	2	Jabon (<i>Anthocephalus cadamba</i>)	802,085.50	9,061,738.45	45.00	16.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
33	3	Bindung (<i>Tetrameles nudiflora</i>)	802,085.50	9,061,738.45	32.00	14.00
33	4	Bendo (<i>Artocarpus elasticus</i>)	802,087.50	9,061,737.95	86.00	14.00
33	5	Bayur (<i>Pterospermum diversifolium</i>)	802,095.00	9,061,737.95	42.00	13.00
33	6	Bendo (<i>Artocarpus elasticus</i>)	802,096.50	9,061,747.45	46.00	12.00
33	7	Kenongo (<i>Cananga odorata</i>)	802,097.00	9,061,741.95	23.00	10.00
33	8	Rau (<i>Dracontomelon mangiferum</i>)	802,104.00	9,061,747.95	22.00	16.00
33	9	Kenongo (<i>Cananga odorata</i>)	802,104.50	9,061,750.45	37.00	18.00
33	10	Glindungan (<i>Bischofia javanica</i>)	802,113.50	9,061,751.95	122.00	22.00
33	11	Bindung (<i>Tetrameles nudiflora</i>)	802,113.00	9,061,739.45	22.00	13.00
33	12	Budengan(<i>Diospyros cailiflora</i>)	802,114.50	9,061,744.45	20.00	14.00
33	13	Besole (<i>Chydenanthus ecelcus</i>)	802,118.00	9,061,745.95	45.00	12.00
33	14	Ledoyo (<i>Dysoxylum amoroides</i>)	802,118.00	9,061,740.45	25.00	15.00
33	15	Ledoyo (<i>Dysoxylum amoroides</i>)	802,127.00	9,061,751.95	92.00	14.00
33	16	Sentul (<i>Sandoricum koetjape</i>)	802,129.50	9,061,748.95	43.00	15.00
33	17	Sentul (<i>Sandoricum koetjape</i>)	802,131.50	9,061,739.45	20.00	11.00
33	18	Budengan (<i>Diospyros cailiflora</i>)	802,136.00	9,061,737.45	29.00	14.00
33	19	Kancilan (<i>Alchornea rugosa</i>)	802,136.50	9,061,750.95	40.00	12.00
33	20	Kancilan (<i>Alchornea rugosa</i>)	802,136.50	9,061,750.95	28.00	10.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
33	21	Sentul (<i>Sandoricum koetjape</i>)	802,144.00	9,061,739.95	40.00	14.00
33	22	Sentul (<i>Sandoricum koetjape</i>)	802,149.00	9,061,752.45	21.00	14.00
33	23	Rau (<i>Dracontomelon mangiferum</i>)	802,151.50	9,061,748.45	45.00	15.00
33	24	Bendo (<i>Artocarpus elasticus</i>)	802,153.50	9,061,750.45	100.00	14.00
33	25	Apak (<i>Ficus benjamina</i>)	802,153.50	9,061,750.45	44.00	14.00
33	26	Sentul (<i>Sandoricum koetjape</i>)	802,155.00	9,061,751.45	38.00	12.00
33	27	Sentul (<i>Sandoricum koetjape</i>)	802,157.00	9,061,752.45	29.00	12.00
33	28	Budengan (<i>Diospyros cailiflora</i>)	802,156.00	9,061,745.45	25.00	10.00
33	29	Sentul (<i>Sandoricum koetjape</i>)	802,159.00	9,061,741.95	21.00	11.00
33	30	Sentul (<i>Sandoricum koetjape</i>)	802,161.00	9,061,741.45	23.00	13.00
33	31	Berasan (<i>Gomphia serrata</i>)	802,159.00	9,061,738.95	61.00	17.00
33	32	Sentul (<i>Sandoricum koetjape</i>)	802,165.50	9,061,739.45	42.00	13.00
33	33	Rau (<i>Dracontomelon mangiferum</i>)	802,169.50	9,061,753.45	30.00	11.00
33	34	Sentul (<i>Sandoricum koetjape</i>)	802,173.50	9,061,740.45	51.00	15.00
33	35	Sentul (<i>Sandoricum koetjape</i>)	802,174.50	9,061,740.95	28.00	7.00
33	36	Pluncing (<i>Spondias pinnata</i>)	802,179.00	9,061,739.45	24.00	8.00
33	37	Sentul (<i>Sandoricum koetjape</i>)	802,182.00	9,061,740.95	40.00	12.00
34	1	Pluncing (<i>Spondias pinnata</i>)	801,056.94	9,061,417.20	50.00	17.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
34	2	Besole (<i>Chydenanthus ecelcus</i>)	801,061.19	9,061,425.38	117.00	16.00
34	3	Sapen (<i>Pometia tomentosa</i>)	801,069.70	9,061,421.51	23.00	15.00
34	4	Besole (<i>Chydenanthus ecelcus</i>)	801,065.56	9,061,428.25	103.00	12.00
34	5	Bendo (<i>Artocarpus elasticus</i>)	801,071.18	9,061,424.84	64.00	15.00
34	6	Besole (<i>Chydenanthus ecelcus</i>)	801,074.38	9,061,424.76	47.00	16.00
34	7	Ledoyo (<i>Dysoxylum amoroides</i>)	801,071.34	9,061,435.14	30.00	16.00
34	8	Bendo (<i>Artocarpus elasticus</i>)	801,079.46	9,061,431.60	51.00	16.00
34	9	Aren (<i>Arenga pinata</i>)	801,077.91	9,061,445.30	37.00	11.00
34	10	Besole (<i>Chydenanthus ecelcus</i>)	801,080.92	9,061,447.34	63.00	21.00
34	11	Aren (<i>Arenga pinata</i>)	801,088.34	9,061,443.73	39.00	10.00
34	12	Sentul (<i>Sandoricum koetjape</i>)	801,089.05	9,061,447.70	41.00	15.00
34	13	Pluncing (<i>Spondias pinnata</i>)	801,088.94	9,061,453.01	70.00	27.00
34	14	Besole (<i>Chydenanthus ecelcus</i>)	801,095.10	9,061,455.68	78.00	16.00
34	15	Sentul (<i>Sandoricum koetjape</i>)	801,091.02	9,061,461.71	40.00	6.00
34	16	Sentul (<i>Sandoricum koetjape</i>)	801,093.84	9,061,461.96	41.00	14.00
34	17	Sentul (<i>Sandoricum koetjape</i>)	801,099.74	9,061,463.54	27.00	17.00
34	18	Bungur (<i>Lagerstroemia speciosa</i>)	801,105.51	9,061,466.52	32.00	13.00
34	19	Besole (<i>Chydenanthus ecelcus</i>)	801,107.96	9,061,471.00	48.00	16.00
34	20	Sapen (<i>Pometia tomentosa</i>)	801,106.11	9,061,475.81	33.00	10.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
34	21	Bendo (<i>Artocarpus elasticus</i>)	801,113.15	9,061,472.52	45.00	17.00
34	22	Bendo (<i>Artocarpus elasticus</i>)	801,112.99	9,061,482.44	103.00	21.00
34	23	Talesan (<i>Persea odoratissima</i>)	801,113.75	9,061,481.80	22.00	16.00
34	24	Glindungan (<i>Bischofia javanica</i>)	801,125.15	9,061,481.37	24.00	15.00
34	25	Sentul (<i>Sandoricum koetjape</i>)	801,123.94	9,061,483.04	31.00	16.00
34	26	Sentul (<i>Sandoricum koetjape</i>)	801,120.04	9,061,486.96	48.00	21.00
35	1	Jati (<i>Tectona grandis</i>)	799,083.43	9,061,708.57	42.00	16.00
35	2	Jati (<i>Tectona grandis</i>)	799,086.39	9,061,711.31	78.00	17.00
35	3	Jati (<i>Tectona grandis</i>)	799,087.40	9,061,707.85	63.00	16.00
35	4	Jati (<i>Tectona grandis</i>)	799,091.43	9,061,706.43	27.00	12.00
35	5	Jati (<i>Tectona grandis</i>)	799,084.62	9,061,699.09	48.00	14.00
35	6	Jati (<i>Tectona grandis</i>)	799,093.56	9,061,694.19	48.00	17.00
35	7	Jati (<i>Tectona grandis</i>)	799,090.04	9,061,693.89	55.00	15.00
35	8	Jati (<i>Tectona grandis</i>)	799,099.17	9,061,686.88	42.00	14.00
35	9	Jati (<i>Tectona grandis</i>)	799,097.43	9,061,682.46	51.00	16.00
35	10	Jati (<i>Tectona grandis</i>)	799,101.14	9,061,680.66	29.00	15.00
35	11	Jati (<i>Tectona grandis</i>)	799,096.03	9,061,702.57	42.00	17.00
35	12	Jati (<i>Tectona grandis</i>)	799,110.00	9,061,688.89	68.00	19.00
35	13	Jati (<i>Tectona grandis</i>)	799,114.03	9,061,687.47	42.00	14.00
35	14	Luwingan (<i>Ficus hispida</i>)	799,117.30	9,061,690.59	22.00	12.00
35	15	Jati (<i>Tectona grandis</i>)	799,106.83	9,061,680.45	40.00	15.00
35	16	Jati (<i>Tectona grandis</i>)	799,109.06	9,061,675.32	42.00	12.00
35	17	Jati (<i>Tectona grandis</i>)	799,118.88	9,061,684.70	42.00	22.00
35	18	Jati (<i>Tectona grandis</i>)	799,113.73	9,061,674.66	41.00	14.00
35	19	Jati (<i>Tectona grandis</i>)	799,124.00	9,061,683.01	38.00	15.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
35	20	Bungur (<i>Lagerstroemia speciosa</i>)	799,117.74	9,061,669.34	22.00	7.00
35	21	Jati (<i>Tectona grandis</i>)	799,130.25	9,061,676.46	61.00	16.00
35	22	Klayu (<i>Garuga floribunda</i>)	799,124.64	9,061,663.55	26.00	8.00
35	23	Jati (<i>Tectona grandis</i>)	799,135.35	9,061,670.88	24.00	9.00
35	24	Jati (<i>Tectona grandis</i>)	799,140.79	9,061,669.58	64.00	23.00
35	25	Jati (<i>Tectona grandis</i>)	799,128.21	9,061,659.25	67.00	21.00
35	26	Sonokeling (<i>Paraserianthes falcataria</i>)	799,141.49	9,061,649.41	71.00	19.00
35	27	Sonokeling (<i>Paraserianthes falcataria</i>)	799,139.69	9,061,645.70	82.00	19.00
35	28	Jati (<i>Tectona grandis</i>)	799,152.90	9,061,652.89	45.00	4.00
35	29	Johar (<i>Cassia siamea</i>)	799,157.77	9,061,654.03	49.00	19.00
35	30	Jati (<i>Tectona grandis</i>)	799,154.10	9,061,647.32	50.00	17.00
36	1	Kedawung (<i>Parkia timoriana</i>)	793,568.50	9,067,829.00	25.00	12.00
36	2	Kedawung (<i>Parkia timoriana</i>)	793,569.50	9,067,827.00	22.00	12.00
36	3	Nangka (<i>Artocapus integra</i>)	793,557.00	9,067,827.00	22.00	7.00
36	4	Kemiri (<i>Aleurites Moluccana</i>)	793,566.00	9,067,810.00	24.00	9.00
36	5	Pace (<i>Morinda citrifolia</i>)	793,572.00	9,067,798.50	21.00	7.00
36	6	Nangka (<i>Artocapus integra</i>)	793,561.00	9,067,750.00	21.00	7.00
36	7	Nangka (<i>Artocapus integra</i>)	793,559.00	9,067,734.00	23.00	5.00
36	8	Kedawung (<i>Parkia timoriana</i>)	793,573.50	9,067,731.50	23.00	10.00
37	1	Gondang (<i>Ficus variegata</i>)	793,884.00	9,063,655.00	28.00	10.00
37	2	Gempol (<i>Nauclea orientalis</i>)	793,894.50	9,063,655.00	20.00	10.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
37	3	Gempol (<i>Nauclea orientalis</i>)	793,895.50	9,063,654.50	36.00	11.00
37	4	Serut (<i>Streblus asper</i>)	793,912.00	9,063,647.50	20.00	6.00
37	5	Katesan (<i>Macaranga denticulata</i>)	793,913.00	9,063,647.50	24.00	12.00
37	6	Suren (<i>Toona sureni</i>)	793,930.50	9,063,648.00	23.00	11.00
37	7	Ketangi (<i>Lagerstroemia speeiosa</i>)	793,966.50	9,063,649.00	25.00	9.00
37	8	Ketangi (<i>Lagerstroemia speeiosa</i>)	793,969.50	9,063,650.00	24.00	8.00
37	9	Budengan (<i>Diospyros cauliflora</i>)	793,979.00	9,063,656.00	45.00	17.00
38	1	Bayur (<i>Pterospermum diversifolium</i>)	793,785.50	9,063,873.00	46.00	17.00
38	2	Kenari (<i>Canarium denticulatum</i>)	793,791.00	9,063,859.00	36.00	17.00
38	3	Bendo (<i>Artocarpus elasticus</i>)	793,791.00	9,063,861.00	95.00	21.00
38	4	Bayur (<i>Pterospermum diversifolium</i>)	793,791.00	9,063,856.50	36.00	17.00
38	5	Bayur (<i>Pterospermum diversifolium</i>)	793,794.50	9,063,834.00	51.00	23.00
38	6	Wadung (<i>Garcinia tetranda</i>)	793,785.00	9,063,836.50	30.00	14.00
38	7	Rayoh	793,787.00	9,063,816.50	57.00	26.00
38	8	Kenari (<i>Canarium denticulatum</i>)	793,781.50	9,063,809.00	41.00	20.00
38	9	Kenari (<i>Canarium denticulatum</i>)	793,781.50	9,063,808.50	37.00	19.00
38	10	Rayoh	793,781.50	9,063,808.00	47.00	21.00
38	11	Pluncing (<i>Spondias pinnata</i>)	793,785.00	9,063,804.00	77.00	24.00
38	12	Pluncing (<i>Spondias pinnata</i>)	793,794.50	9,063,799.50	56.00	21.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
38	13	Pluncing (<i>Spondias pinnata</i>)	793,795.50	9,063,796.50	59.00	21.00
38	14	Aren (<i>Arenga pinata</i>)	793,796.50	9,063,793.00	37.00	10.00
38	15	Kembang Jelaprang (<i>Carium aspenum</i>)	793,784.00	9,063,786.50	29.00	20.00
39	1	Talesan (<i>Persea odoratissima</i>)	791,312.18	9,064,561.54	25.00	11.00
39	2	Pluncing (<i>Spondias pinnata</i>)	791,304.75	9,064,574.40	45.00	21.00
39	3	Timo (<i>Kleinhovia hospita</i>)	791,303.92	9,064,575.14	24.00	22.00
39	4	Kayu Kas (<i>Spanthodea campanulata</i>)	791,310.23	9,064,575.52	24.00	15.00
39	5	Berasan (<i>Gomphia serrata</i>)	791,298.77	9,064,579.11	35.00	10.00
39	6	Pluncing (<i>Spondias pinnata</i>)	791,308.34	9,064,585.86	50.00	30.00
39	7	Saman (<i>Samanea saman</i>)	791,302.45	9,064,588.99	77.00	18.00
39	8	Besole (<i>Chydenanthus ecelcus</i>)	791,310.76	9,064,592.98	45.00	16.00
39	9	Ketangi (<i>Lagerstroemia spceiosa</i>)	791,311.73	9,064,592.72	79.00	21.00
39	10	Besole (<i>Chydenanthus ecelcus</i>)	791,318.97	9,064,590.78	31.00	18.00
39	11	Timo (<i>Kleinhovia hospita</i>)	791,312.13	9,064,601.93	36.00	14.00
39	12	Timo (<i>Kleinhovia hospita</i>)	791,311.16	9,064,602.19	34.00	15.00
39	13	Ketangi (<i>Lagerstroemia spceiosa</i>)	791,321.79	9,064,599.34	34.00	21.00
39	14	Jambu air (<i>Eugenia sp</i>)	791,310.82	9,064,610.56	53.00	13.00
39	15	Timo (<i>Kleinhovia hospita</i>)	791,320.25	9,064,609.07	44.00	18.00
39	16	Suren (<i>Toona sureni</i>)	791,315.09	9,064,626.50	150.00	38.00
39	17	Bendo (<i>Artocarpus elasticus</i>)	791,313.90	9,064,627.86	30.00	20.00
39	18	Timo (<i>Kleinhovia hospita</i>)	791,315.55	9,064,632.07	28.00	18.00

Table 5. (Advanced)

PSP No.	No. of tree	Species	Coordinate X	Coordinate Y	Stem Diameter	Tree height
39	19	Rau (<i>Dracontomelon mangiferum</i>)	791,323.57	9,064,633.03	75.00	21.00
39	20	Talesan (<i>Persea odoratissima</i>)	791,317.64	9,064,634.10	43.00	26.00
39	21	Pluncing (<i>Spondias pinnata</i>)	791,328.28	9,064,639.01	22.00	21.00
39	22	Besole (<i>Chydenanthus ecelcus</i>)	791,321.84	9,064,645.91	100.00	28.00
39	23	Timo (<i>Kleinhovia hospita</i>)	791,321.27	9,064,647.62	29.00	18.00
39	24	Timo (<i>Kleinhovia hospita</i>)	791,321.52	9,064,648.59	36.00	14.00
39	25	Timo (<i>Kleinhovia hospita</i>)	791,321.65	9,064,649.07	30.00	20.00
39	26	Timo (<i>Kleinhovia hospita</i>)	791,322.36	9,064,647.85	28.00	22.00
39	27	Timo (<i>Kleinhovia hospita</i>)	791,337.93	9,064,657.65	40.00	26.00
40	1	Jambuan (<i>Eugenia densiflora</i>)	791,458.50	9,063,788.00	40.00	12.00
40	2	Jambuan (<i>Eugenia densiflora</i>)	791,448.00	9,063,783.00	44.00	9.00

Table 6. Data of dominant tree, soil, undergrowth and litter of PSP

PSP No	Dominant Tree	Tree Density (cm ³ gr)	Soil pH	Undergrowth (kg/ha)	Litter (Kg/ha)
1	Nipah (<i>Nypa fructicans</i>)	0.1320	4.8	18,026.77	
2	Kelapa (<i>Cocos nucifera</i>)	0.3389	6.0	1,462.91	2,298.25
3	Kedawung (<i>Parkia timoriana</i>)	0.5414	4.6	1,589.57	-
4	Langsep (<i>Lansium domesticum</i>)	0.8087	4.5	15,921.86	802.52
5	Cempangan (<i>Dysoxylum densiflorum</i>)	0.6572	5.8	1,729.62	2,470.00
6	Pakem (<i>Pangium edule</i>)	0.4422	5.6	1,600.00	5,720.00
7	Berasan (<i>Gomphia serrata</i>)	0.8492	5.2	4,080.00	4,240.00
8	Besole (<i>Chydenanthus ecelcus</i>)	0.6292	4.5	575.95	2,003.77
9	Pakem (<i>Pangium edule</i>)	0.4502	4.6	120.00	4,591.67
10	Karet (<i>Hevea brasiliensis</i>)	0.6239	6.1	2,640.00	318.32
11	Walangan (<i>Eryngium foetidum</i>)	0.0496	5.0	559.43	3,991.05
12	Cakar ayam (<i>Selaginella doederleinii</i>)	0.7795	5.0	350.78	4,373.33
13	Garu (<i>Antidesma montanum</i>)	0.0880	4.5	385.00	3,007.60
14	Besole (<i>Chydenanthus ecelcus</i>)	0.7810	4.7	1,533.33	2,931.24
15	Apak (<i>Ficus benjamina</i>)	0.3968	4.6	1,594.56	3,320.39
16	Gondang (<i>Ficus variegata</i>)	0.3996	4.3	814.81	2,532.65
17	Kluntungan (<i>Mischocarpus pentapetalus</i>)	0.6477	4.9	311.10	3,565.83
18	Kedu (<i>Planchonella futida</i>)	0.5873	4.4	855.56	2,315.66
19	Kembang jelaprang (<i>Cananga odorata</i>)	0.2406	4.4	871.63	2,808.47
20	Pluncing (<i>Spondias pinnata</i>)	0.4989	3.6	1,922.29	3,247.95
21	Kemiri (<i>Aleurites moluccana</i>)	0.5158	4.8	804.67	-
22	Besole (<i>Chydenanthus ecelcus</i>)	0.6265	5.8	1,789.72	1,559.24
23	Berasan (<i>Gomphia serrata</i>)	0.3494	5.8	1,459.64	1,481.82
24	Berasan (<i>Gomphia serrata</i>)	0.6165	5.6	1,254.81	2,344.42
25	Berasan (<i>Gomphia serrata</i>)	0.4791	5.6	1,819.54	2,024.78

Table 6. (Advanced)

PSP No	Dominant Tree	Tree Density (cm³gr)	Soil pH	Undergrowth (kg/ha)	Litter (Kg/ha)
26	Sentul (<i>Sandaricum koetjape</i>)	0.5596	4.5	1,098.28	1,670.30
27	Timo (<i>Kleinhovia hospita</i>)	0.4865	4.9	2,465.37	7,908.05
28	Keningar (<i>Cynamomum aromaticum</i>)	0.6529	4.3	1,426.91	4,905.28
29	Sriwil Kutil (<i>Sterculia campanulata</i>)	0.4379	4.8	6,366.90	1,159.43
30	Glindungan (<i>Bischofia javanica</i>)	0.5855	4.0	1,883.54	4,569.78
31	Karet (<i>Hevea brazilienzis</i>)	0.6772	4.6	6,074.23	2,212.94
32	Tancang (<i>Bruguera sexangula</i>)	0.2859	4.8	146.67	1,845.00
33	Kenongo (<i>Kanangium odoratum</i>)	0.5111	4.7	639.33	4,335.49
34	Sentul (<i>Sandaricum koetjape</i>)	0.6149	5.0	916.09	12,701.35
35	Jati (<i>Tectona grandis</i>)	0.5478	3.4	2,522.35	2,487.74
36	Kedawung (<i>Parkia timoriana</i>)	0.4801	4.9	9,284.05	-
37	Bambu Bubat (<i>Gigantochloa nogrociliata</i>)	0.6547	4.8	3,145.02	5,721.10
38	Pluncing (<i>Spondias pinnata</i>)	0.5013	4.8	8,400.00	6,160.00
39	Timo (<i>Kleinhovia hospita</i>)	0.5600	5.2	1,894.13	4,394.13
40	Jambu Air (<i>Eugenia sp</i>)	0.7781	6.2	2,092.00	1,960.00

VI. CONCLUSION AND RECOMMENDATION

- Determination of project boundaries and placement of 40 PSPs to monitor carbon stock are important steps to support REDD DA activities. These PSPs would support data and information for the purpose of measuring, reporting and verifying forest inventory and carbon accounting in the ground.
- Basic principle to monitoring changes in REDD is by application of wall-to-wall mapping using satellite images and ground truthing through establishment and measurement of PSPs. This is to ensure that the tier 3 and changes of carbon stock can be monitored accurately by applying principles of MRV.
- For project boundaries, the whole area of 58.000 ha has been determined as the area boundaries. However, for the purpose of REDD mechanism scheme the area would be buffer accordingly.
- Determination of PSP in Project Boundary is made by considering representativeness of zone and types of vegetation. Placement of PSP also consider land use categories according to IPCC GL. For this activity 40 PSPs have been made that represent all zones in MBNP, consisting: 17 PSP in nucleus zone, 14 PSP in forest zone, 3 PSP in rehabilitation zone, 4 PSP in buffer zone, and 2 PSP in intensive utilization zone.
- To apply MRV principle, carbon measurement of PSP refers to IPCC Guideline that measure 5 carbon pools namely above ground biomass, below ground biomass, necromass, litter and soil. For this activity (activity 2.2), initial measurement has been made to identify carbon pools in PSP that consist of above ground biomass (tree, pole and undergrowth), litter (non woody necromass), and soil.

- This boundary activity is initial works for the whole project. Further works will include determination of baseline based on initial data of PSP and historical data using remote sensing images.

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ANNEX 1. PHOTOS OF ACTIVITIES



Photo 1. Ready for departure, Team of Project Boundary and PSP



Photo 2. Measurement of coordinates points using GPS



Photo 3. Placement of PSP pole in the field



Photo 4. Pole of PSP that has been planted



Photo 5. Collection of non woody necromass

ANNEX 2. STRUCTURE OF TREE FOR EVERY PSPS

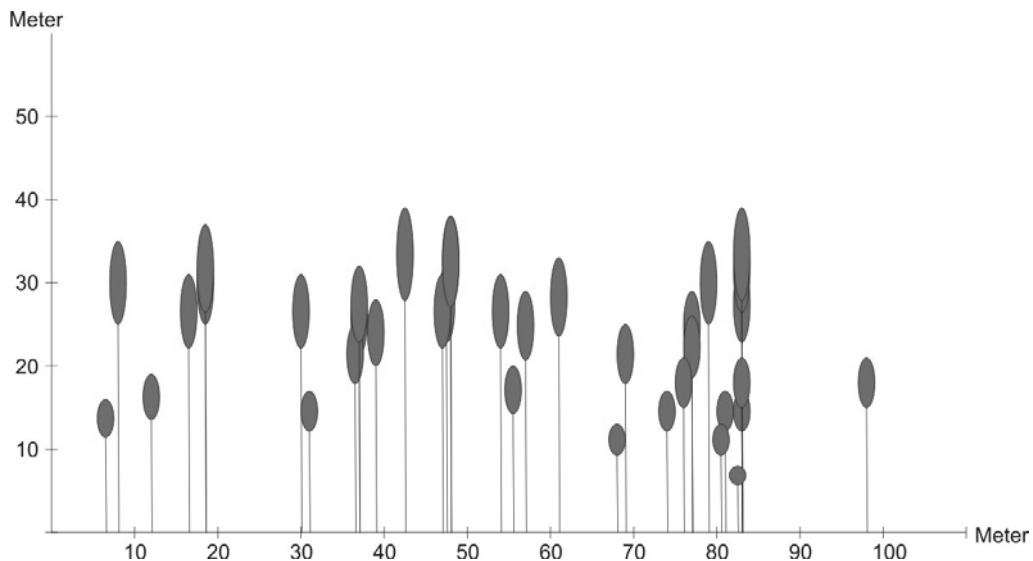


Figure 1. Vertical structure of trees in PSP 2

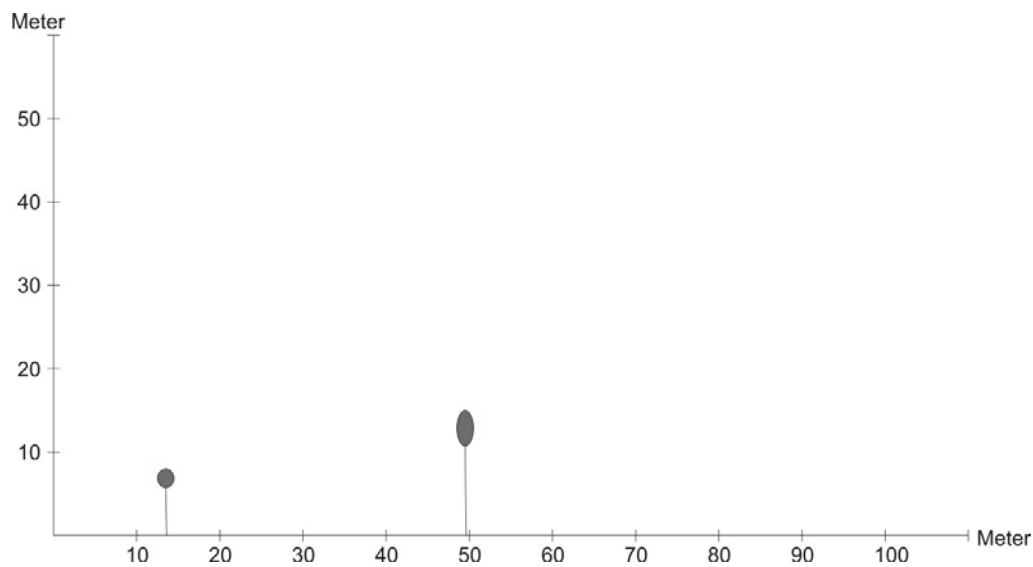


Figure 2. Vertical structure of trees in PSP 3

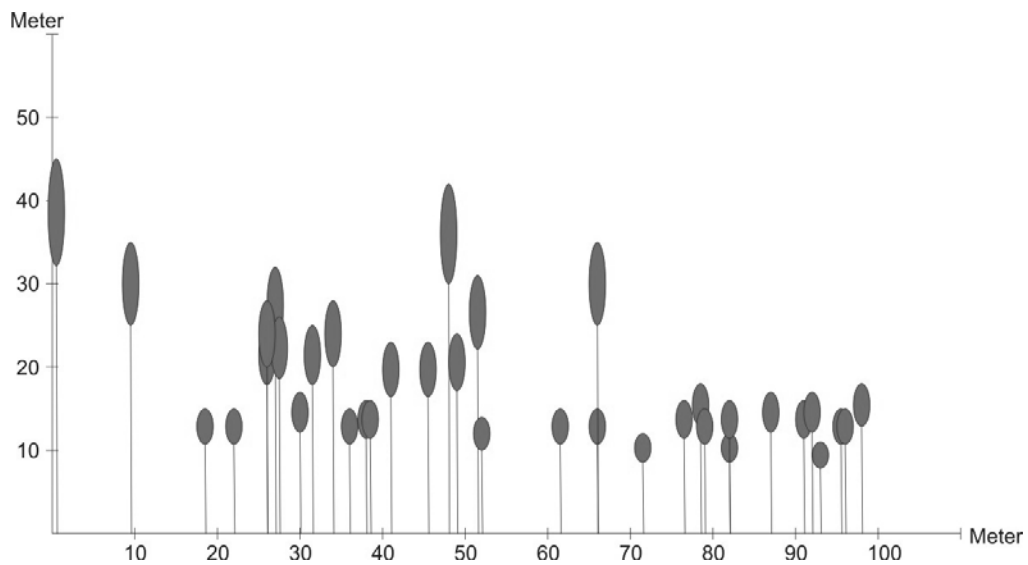


Figure 3. Vertical structure of trees in PSP 4

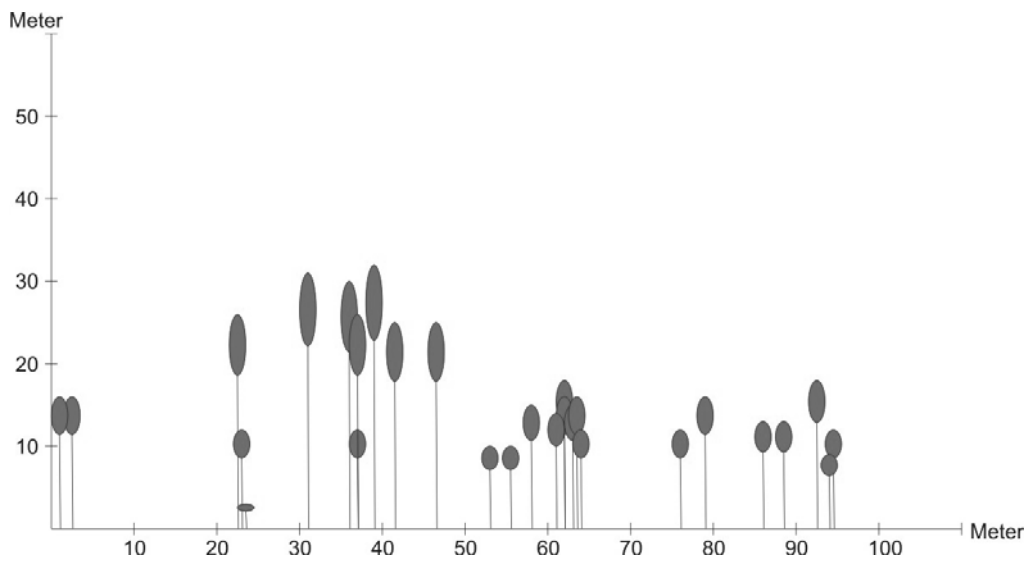


Figure 4. Vertical structure of trees in PSP 5

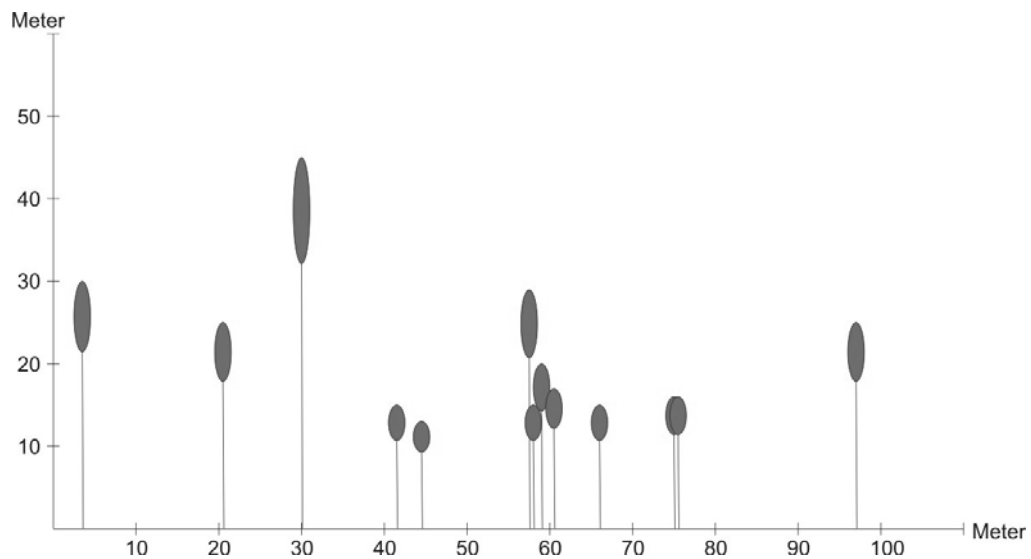


Figure 5. Vertical structure of trees in PSP 6

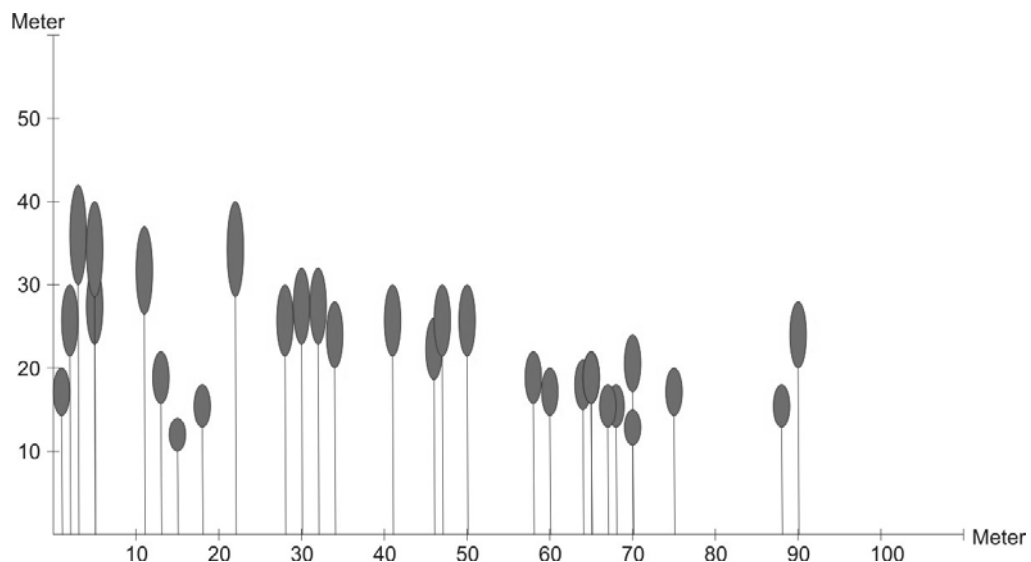


Figure 6. Vertical structure of trees in PSP 7

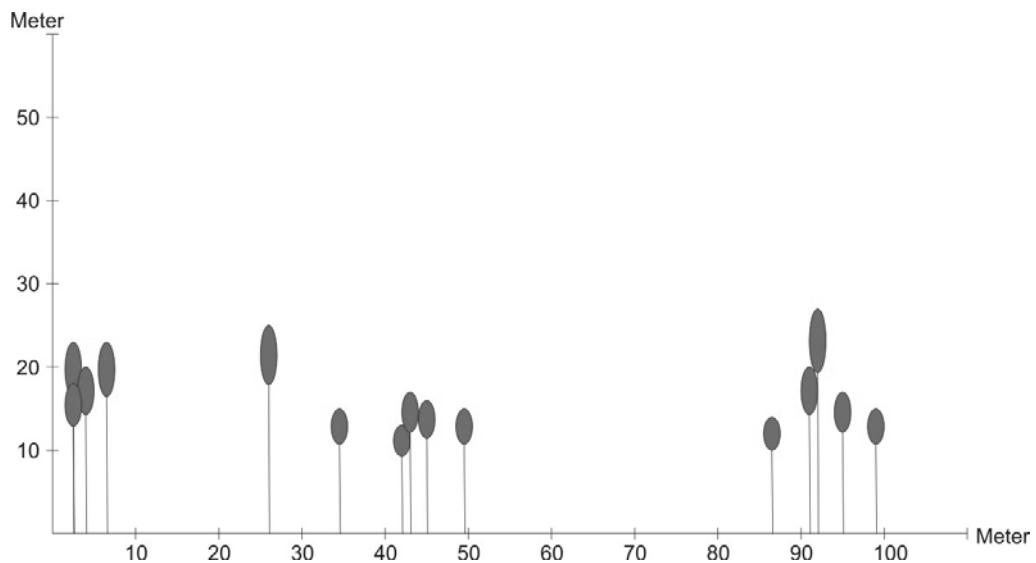


Figure 7. Vertical structure of trees in PSP 8

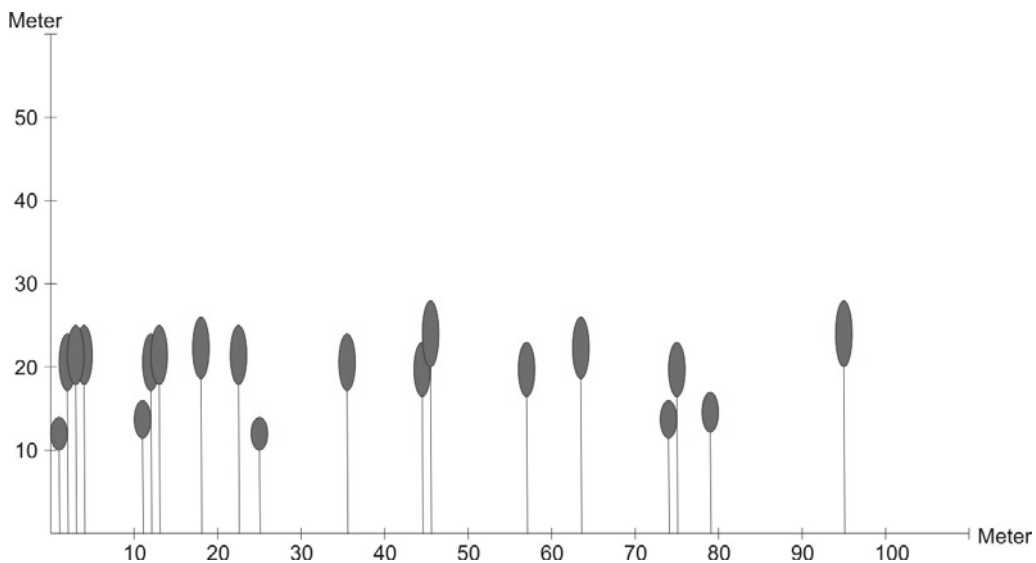


Figure 8. Vertical structure of trees in PSP 9

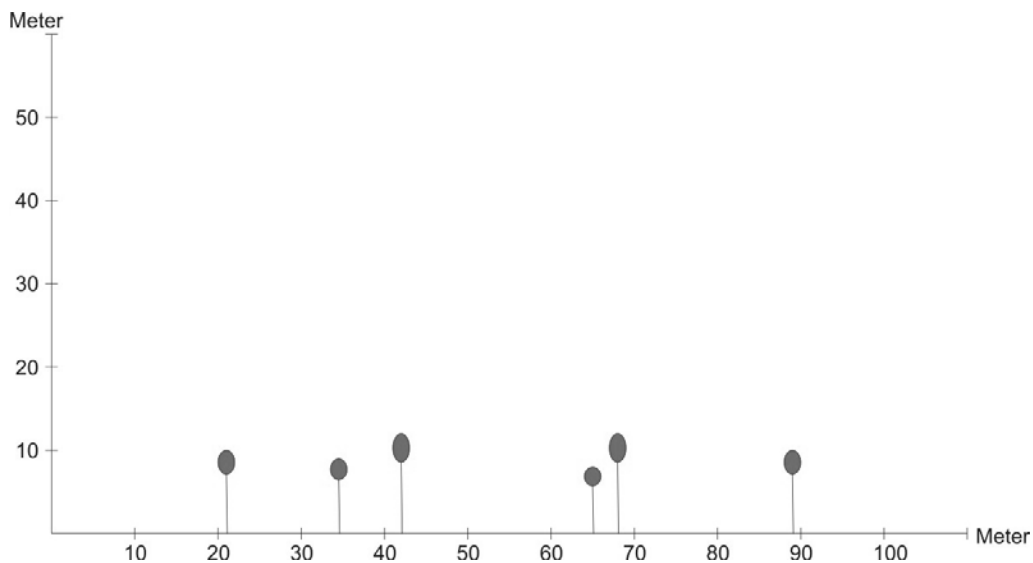


Figure 9. Vertical structure of trees in PSP 10

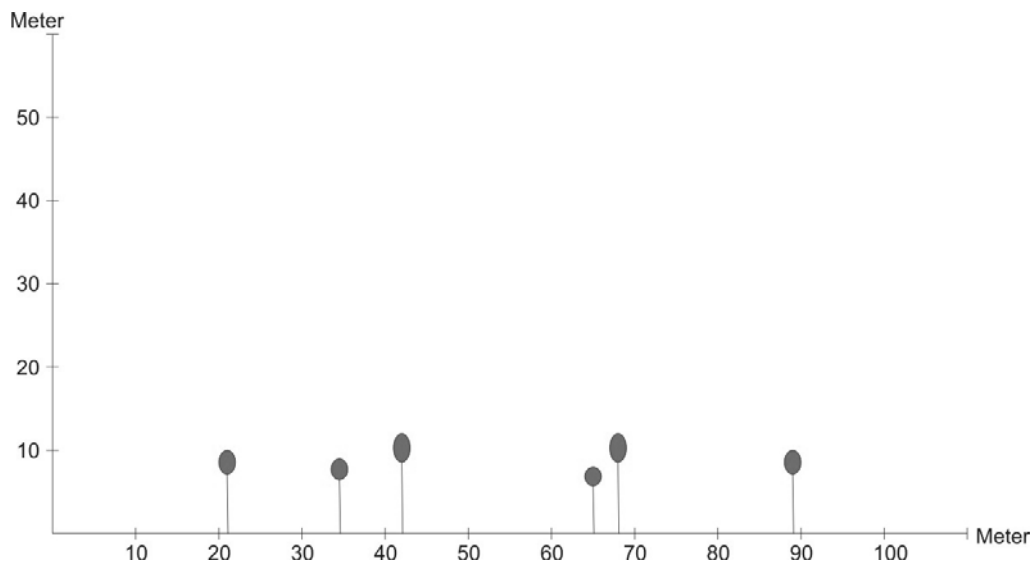


Figure 10. Vertical structure of trees in PSP 11

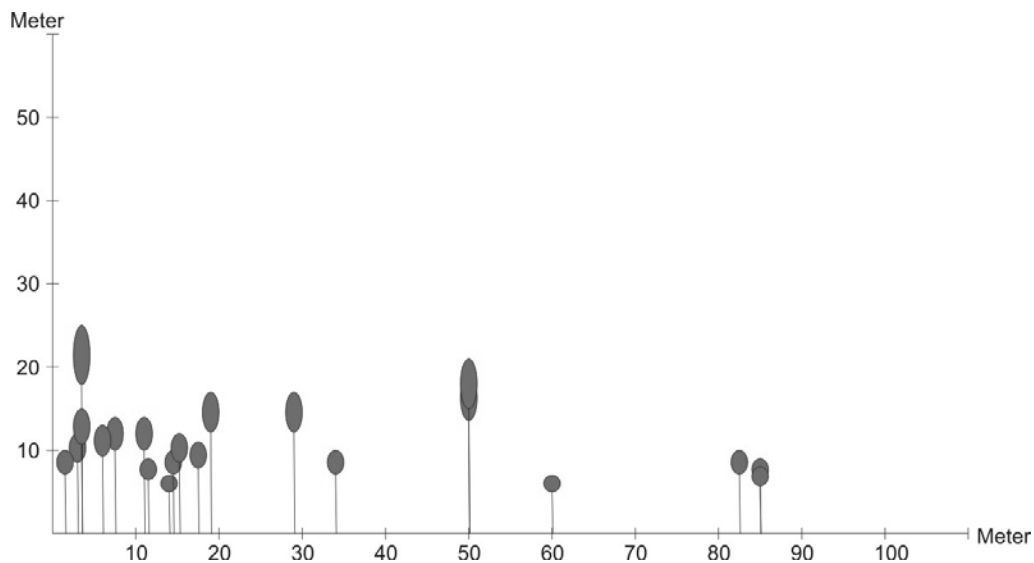


Figure 11. Vertical structure of trees in PSP 12

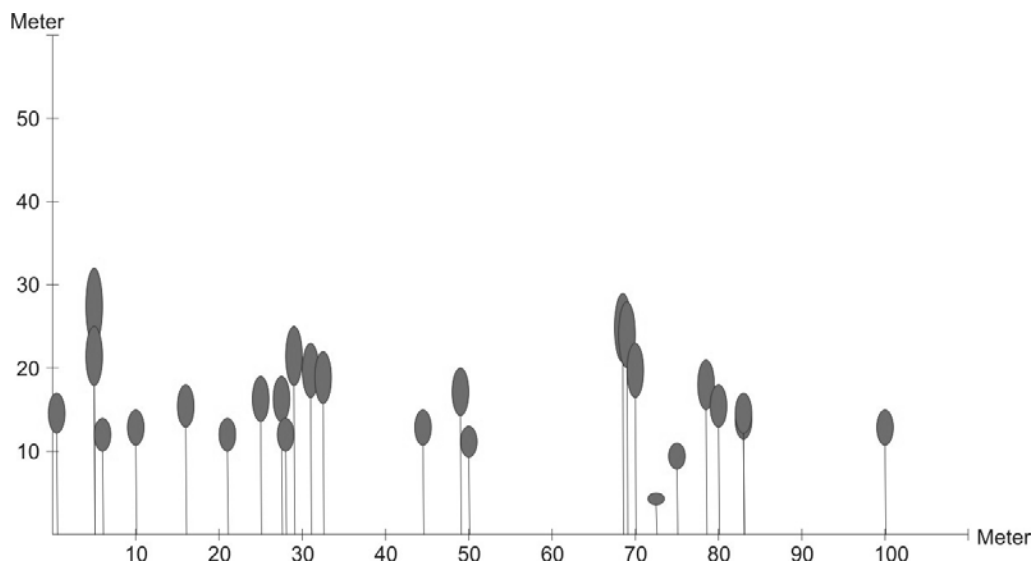


Figure 12. Vertical structure of trees in PSP 13

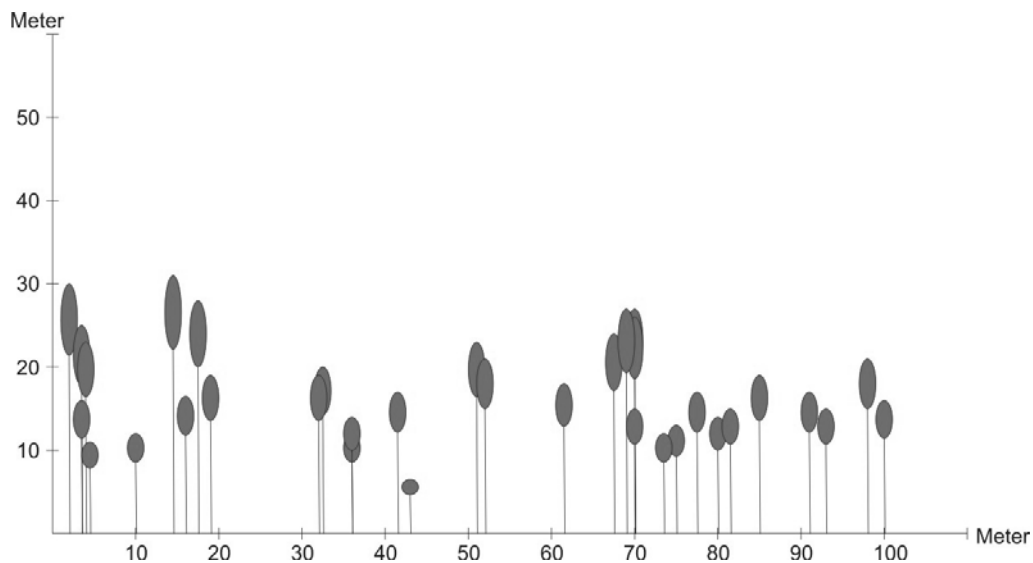


Figure 13. Vertical structure of trees in PSP 14

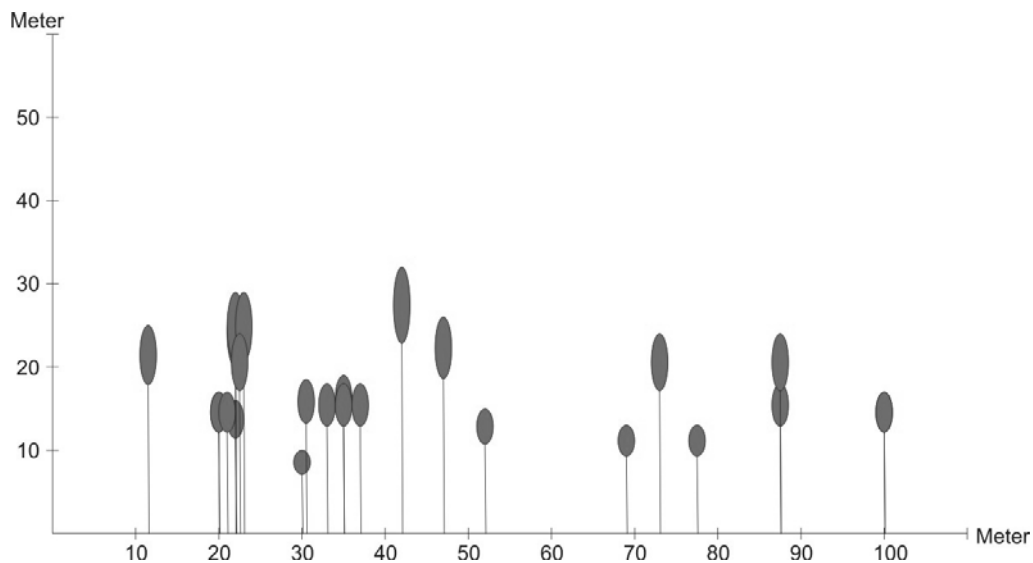


Figure 14. Vertical structure of trees in PSP 15

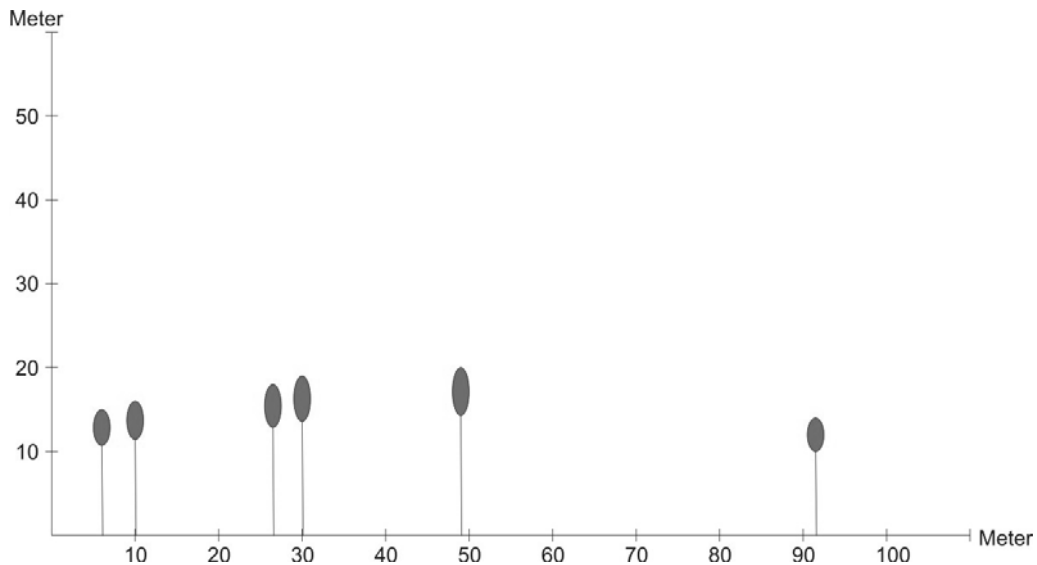


Figure 15. Vertical structure of trees in PSP 16

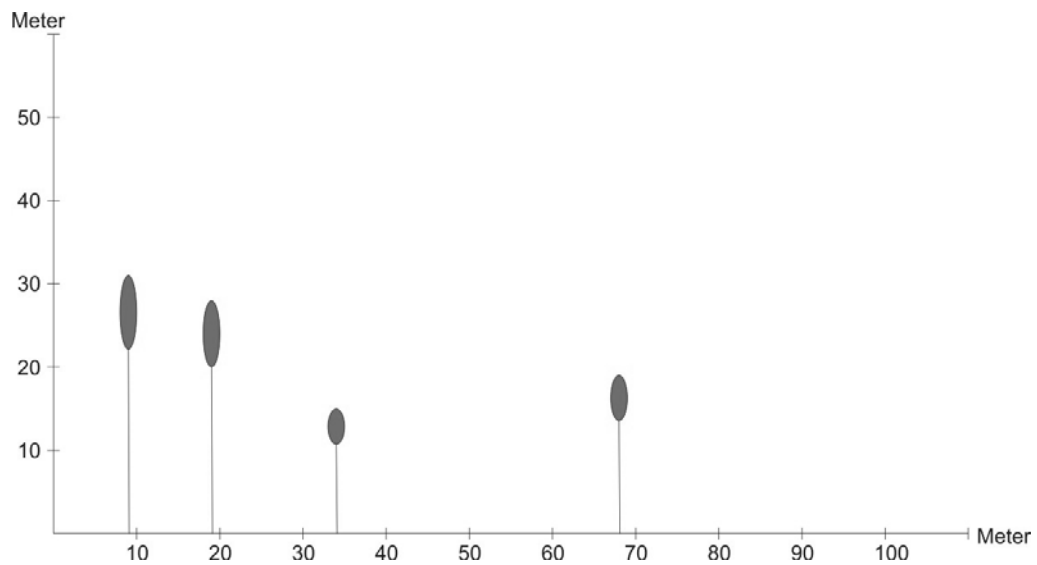


Figure 16. Vertical structure of trees in PSP 17

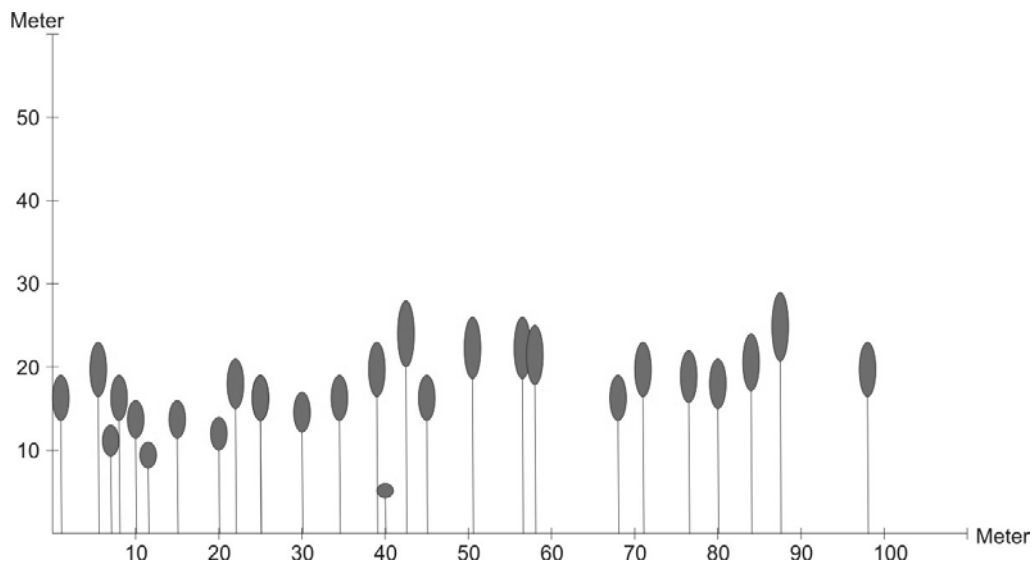


Figure 17. Vertical structure of trees in PSP 18

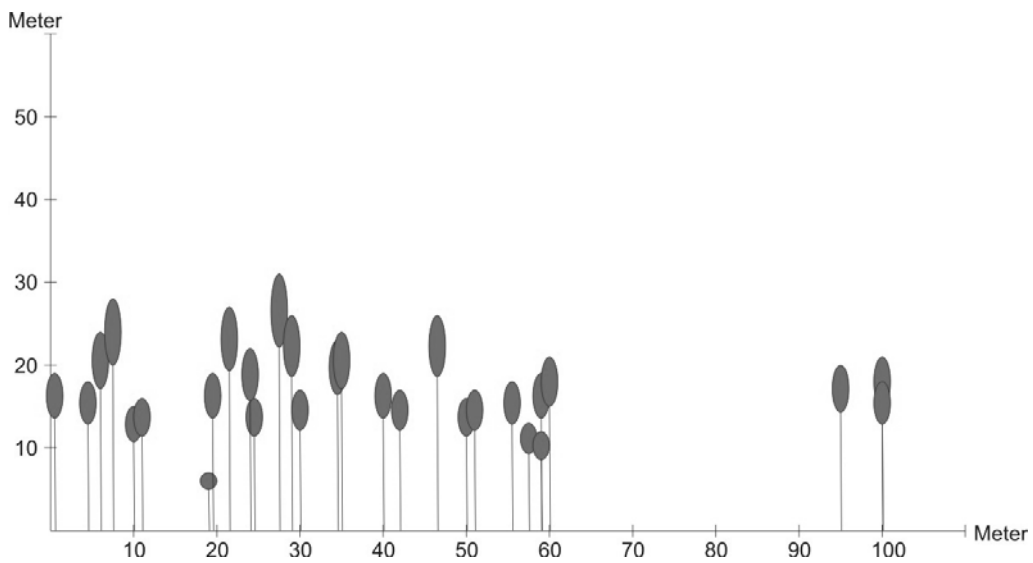


Figure 18. Vertical structure of trees in PSP 19

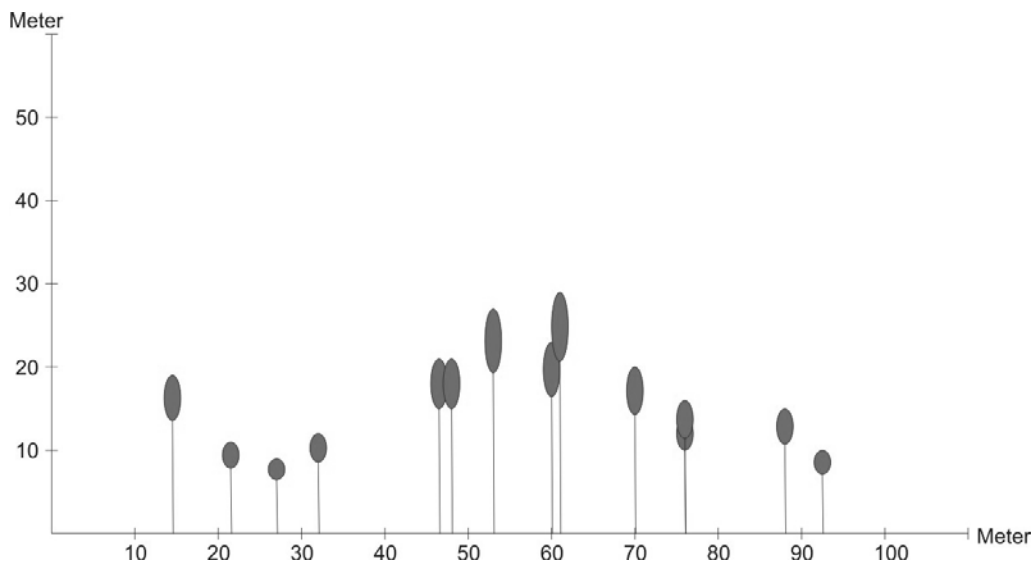


Figure 19. Vertical structure of trees in PSP 20

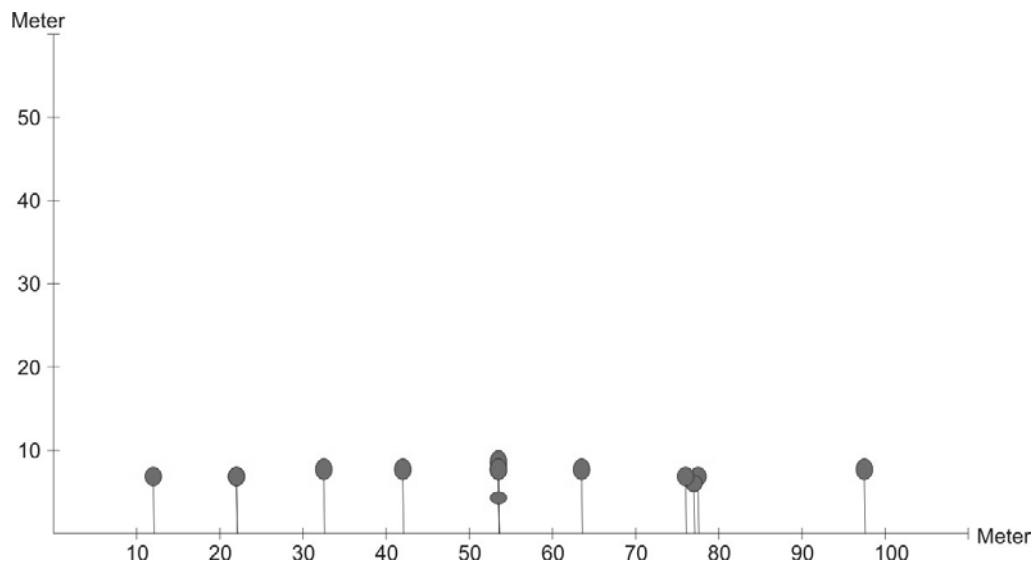


Figure 20. Vertical structure of trees in PSP 21

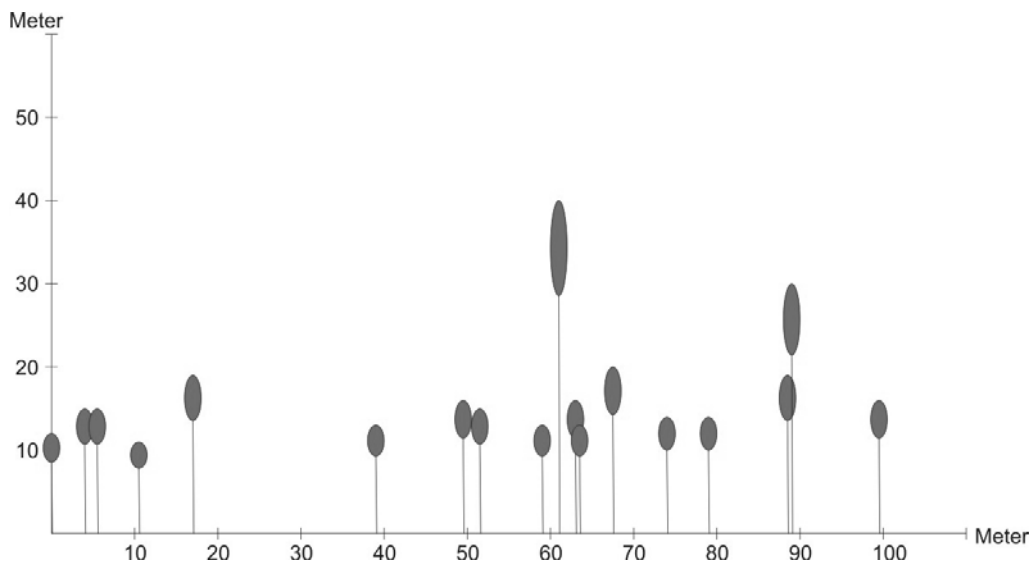


Figure 21. Vertical structure of trees in PSP 22

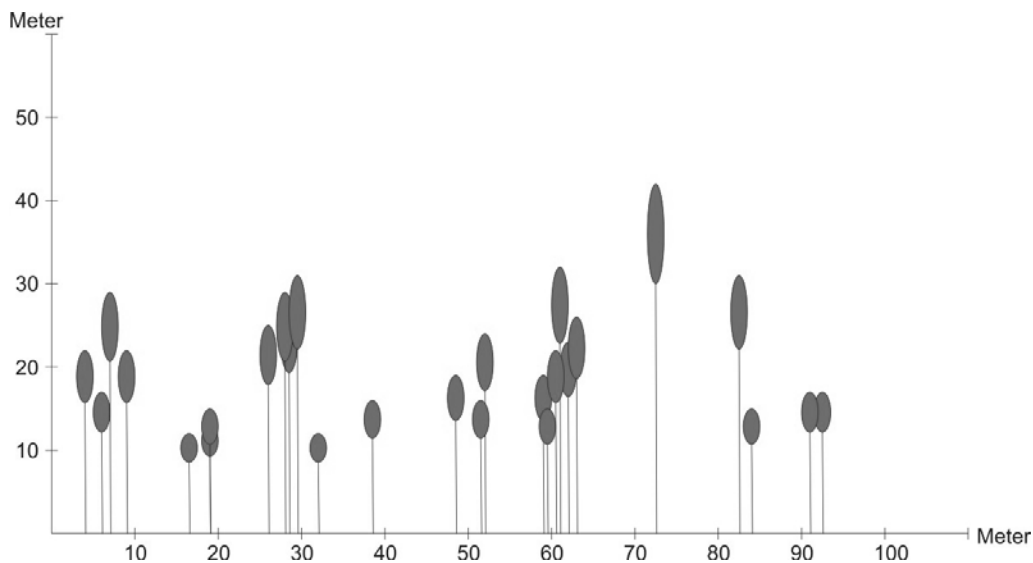


Figure 22. Vertical structure of trees in PSP 23

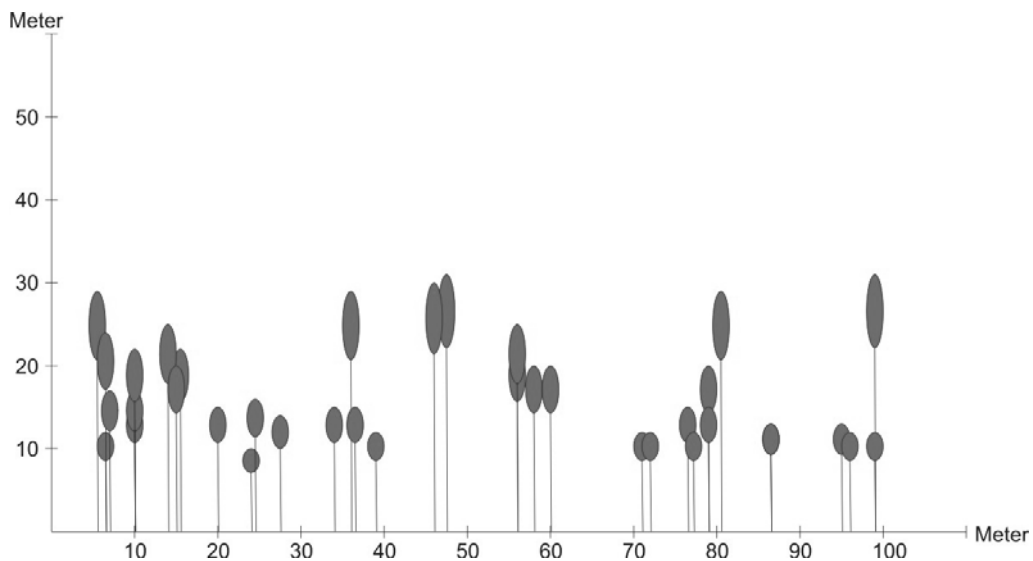


Figure 23. Vertical structure of trees in PSP 24

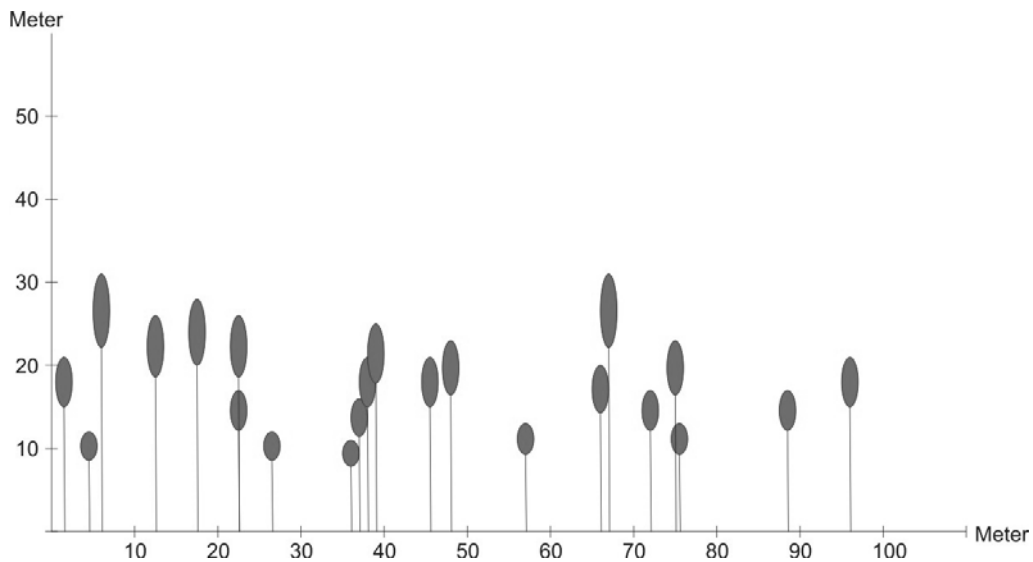


Figure 24. Vertical structure of trees in PSP 25

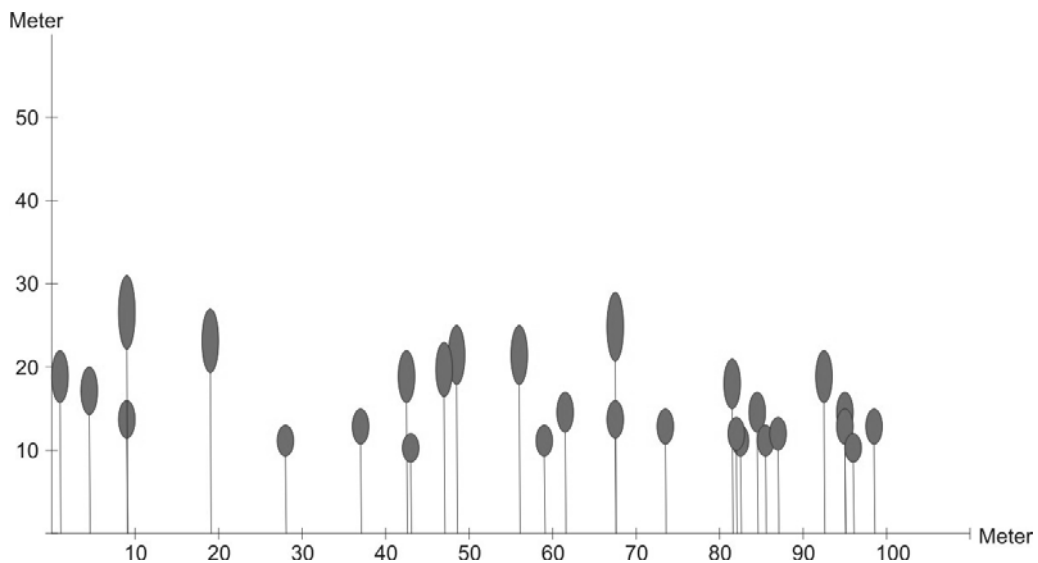


Figure 25. Vertical structure of trees in PSP 26

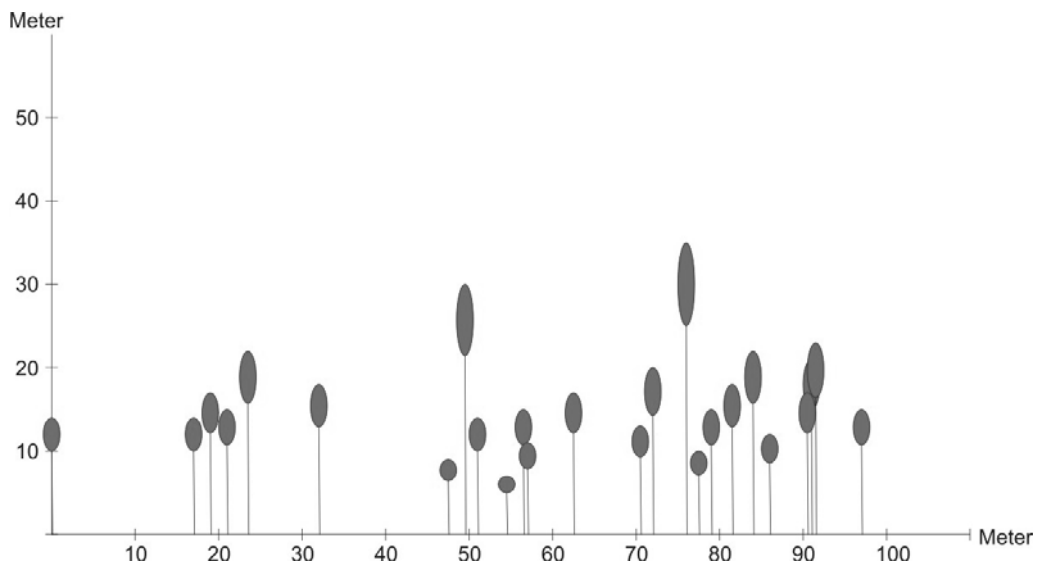


Figure 26. Vertical structure of trees in PSP 27

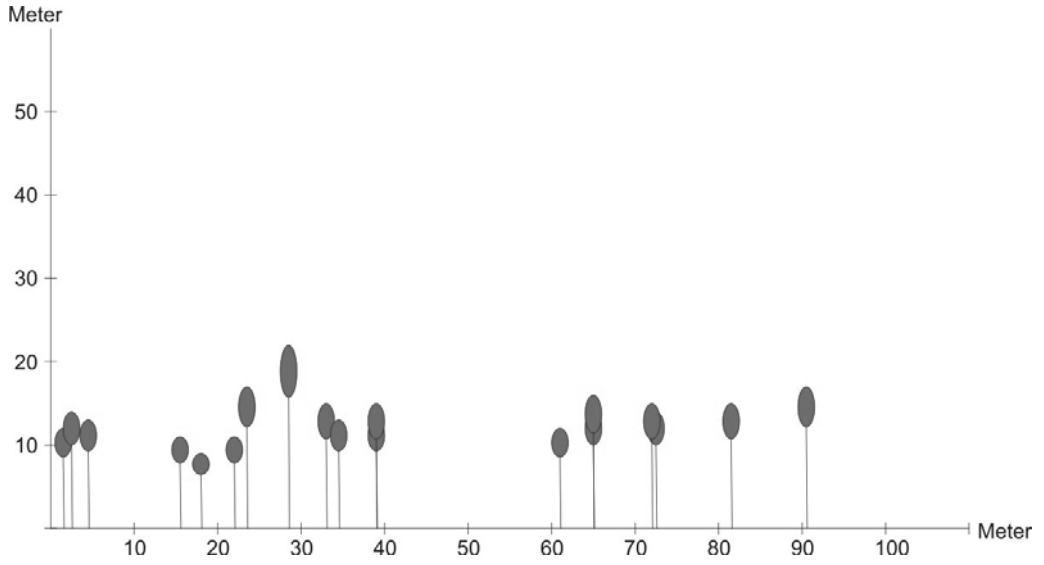


Figure 27. Vertical structure of trees in PSP 28

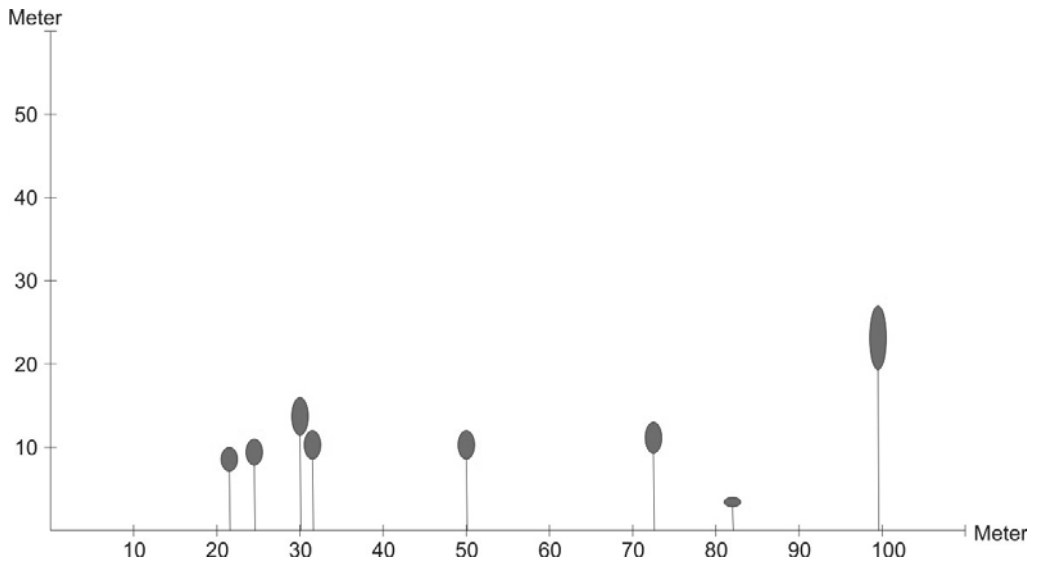


Figure 28. Vertical structure of trees in PSP 29

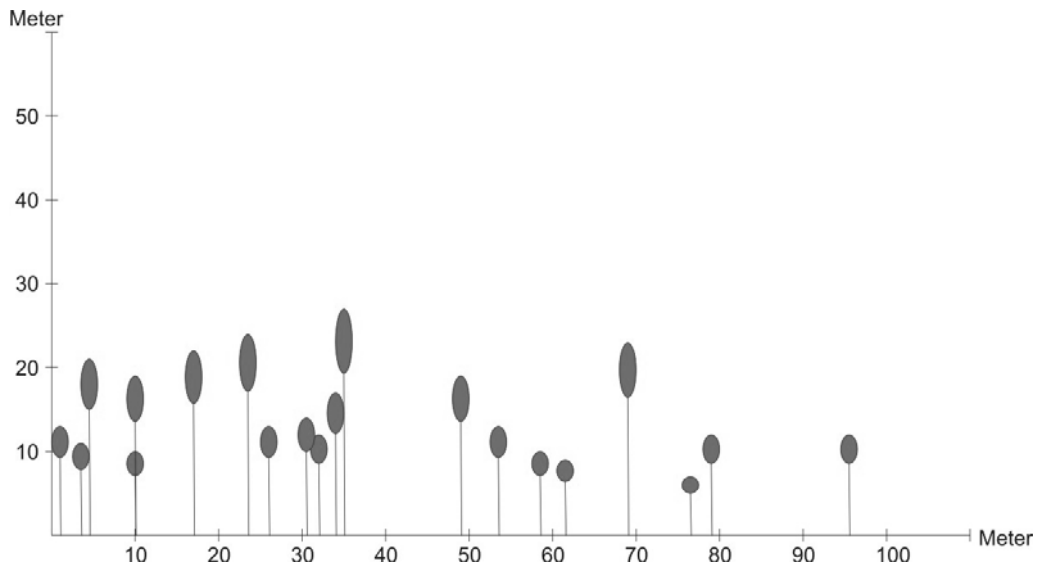


Figure 29. Vertical structure of trees in PSP 30

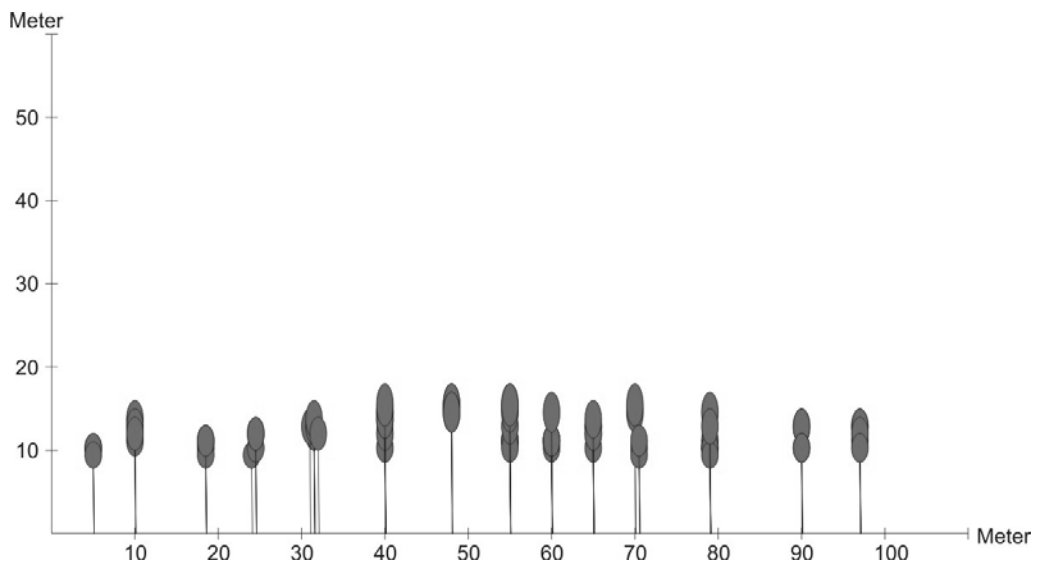


Figure 30. Vertical structure of trees in PSP 31

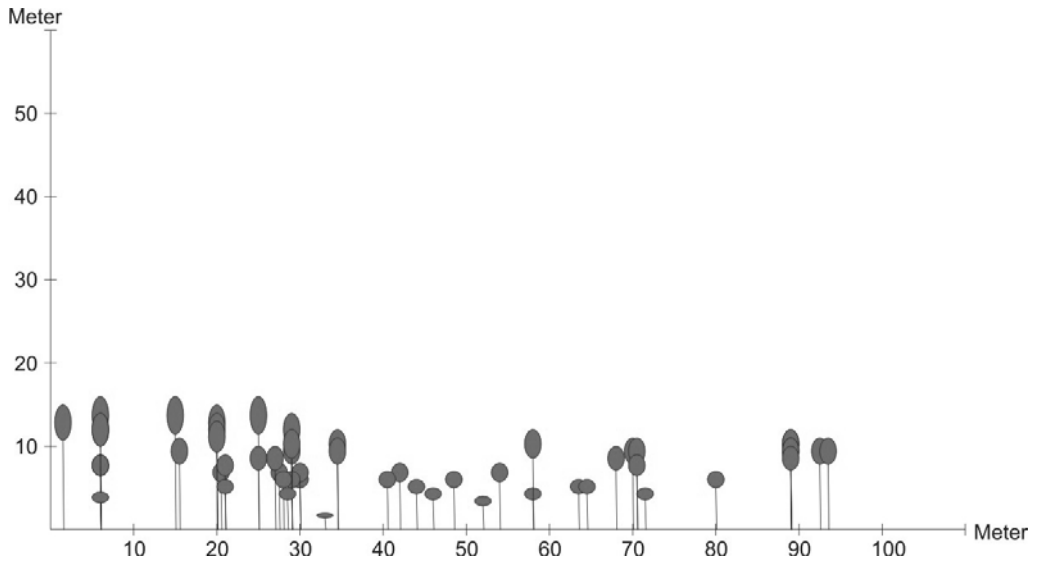


Figure 31. Vertical structure of trees in PSP 32

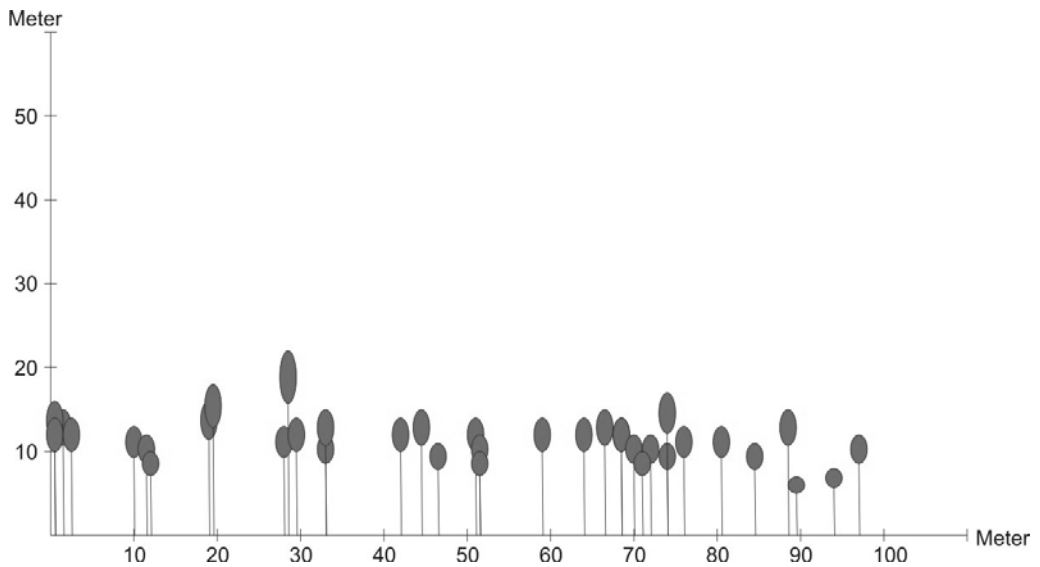


Figure 32. Vertical structure of trees in PSP 33

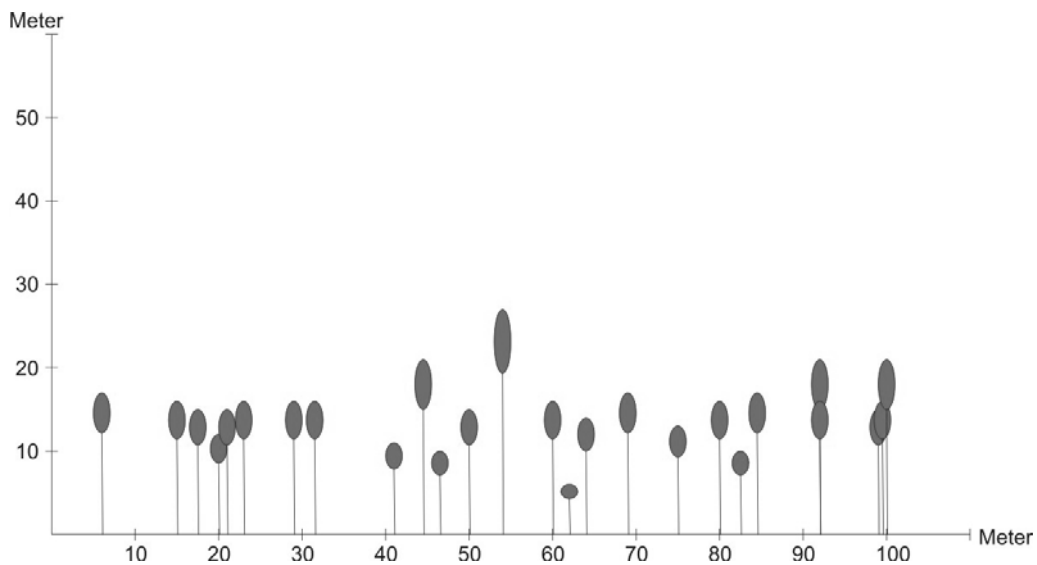


Figure 33. Vertical structure of trees in PSP 34

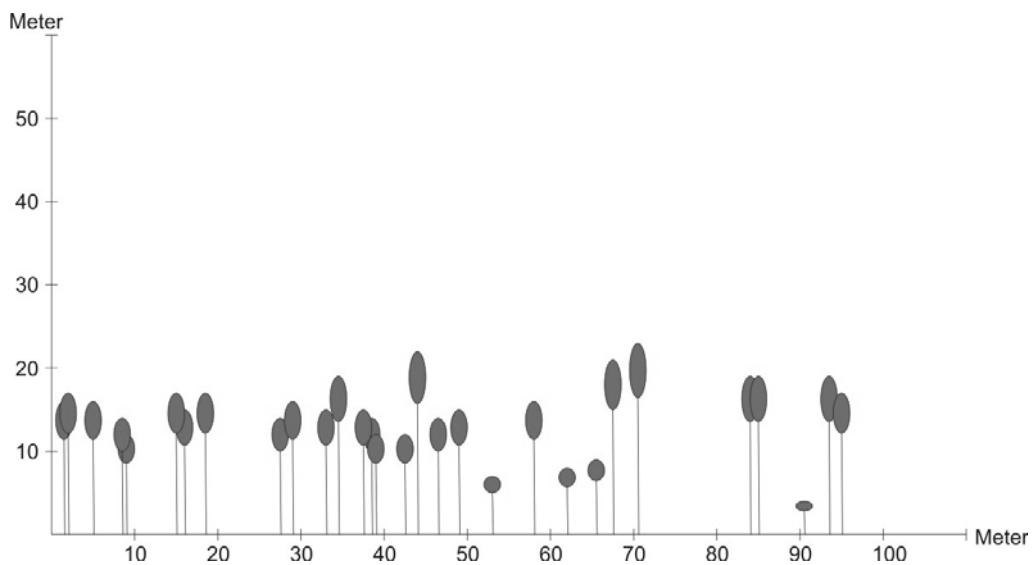


Figure 34. Vertical structure of trees in PSP 35

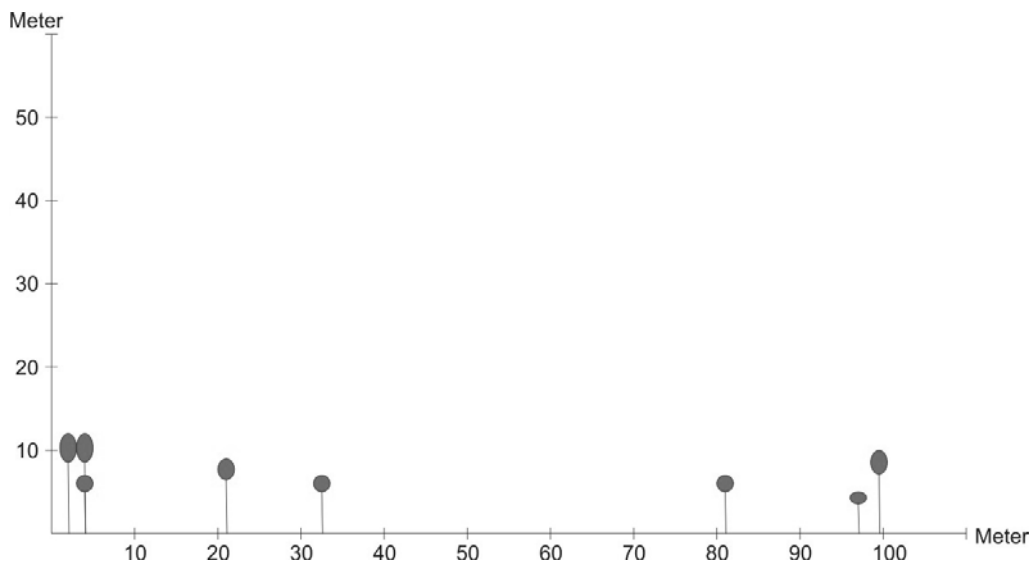


Figure 35. Vertical structure of trees in PSP 36

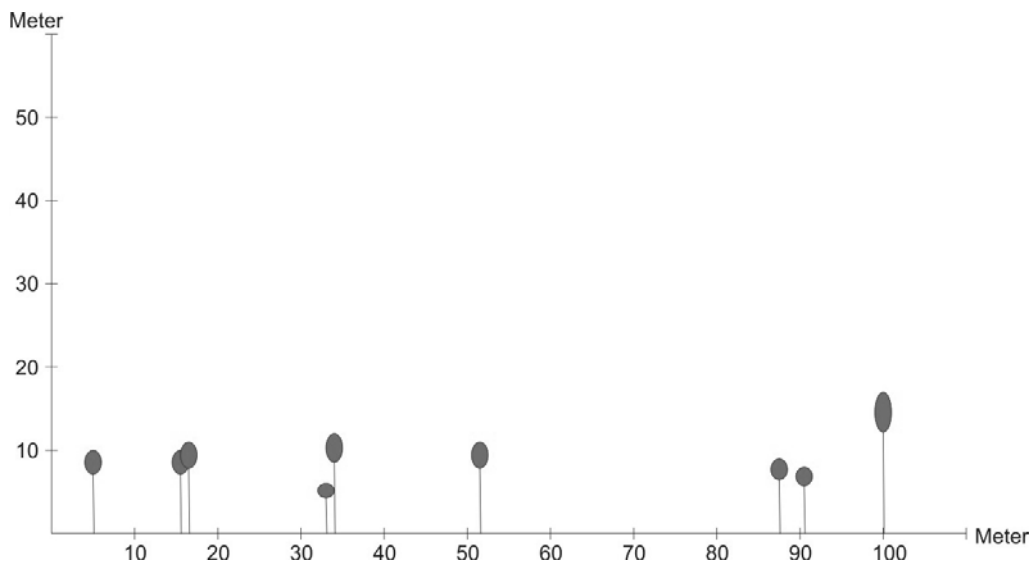


Figure 36. Vertical structure of trees in PSP 37

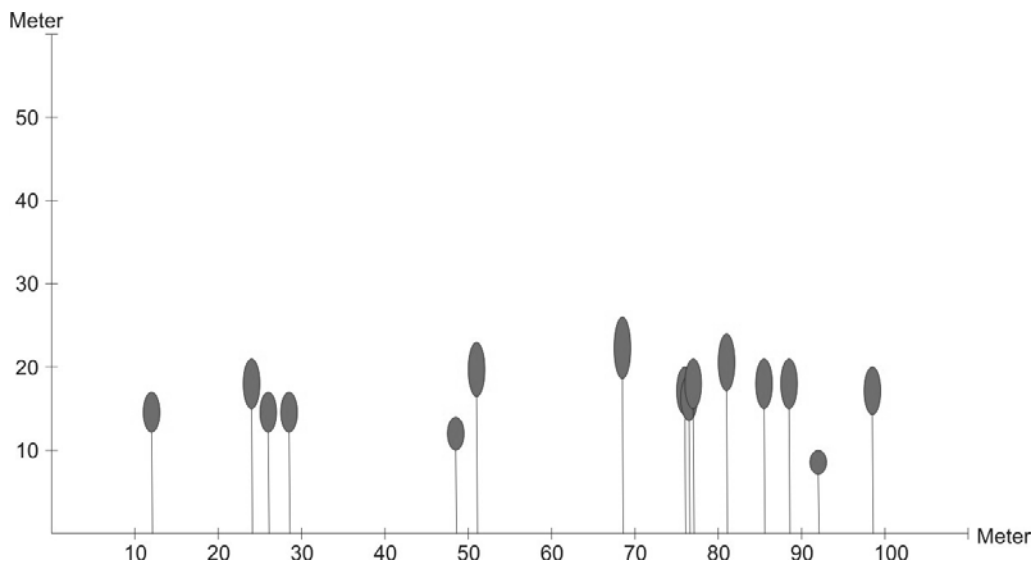


Figure 37. Vertical structure of trees in PSP 38

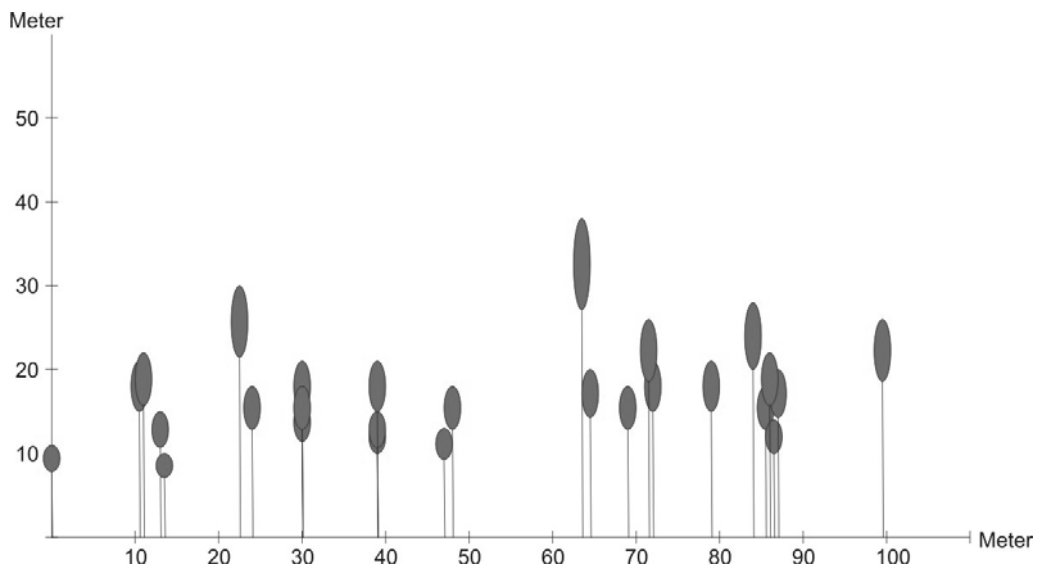


Figure 38. Vertical structure of trees in PSP 39

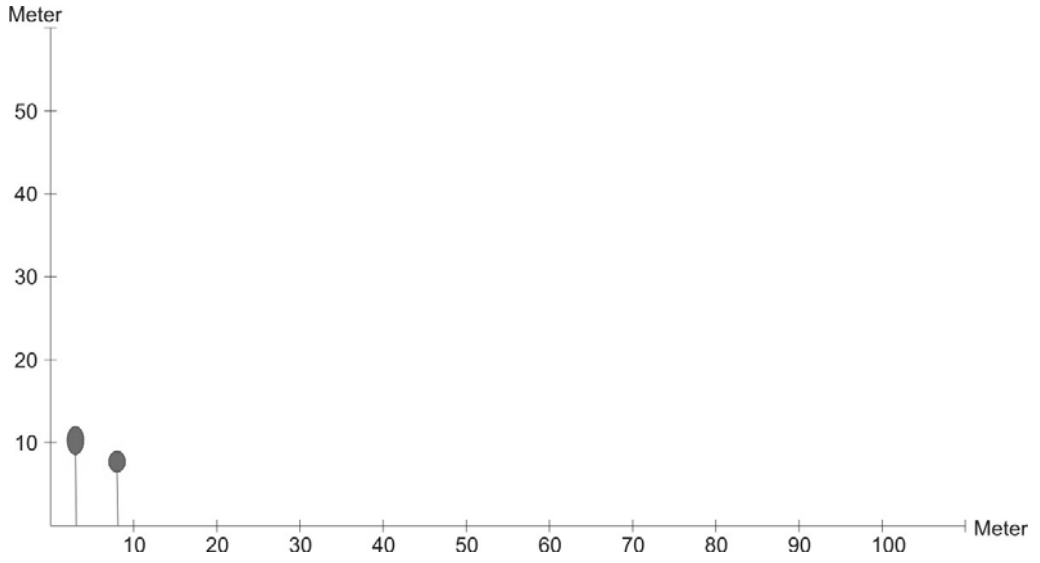


Figure 39. Vertical structure of trees in PSP 40

