The Composition and Vegetation Potention Study of Production Forest in Kphp Dampelas Tinombo Area, Pariasanagung Village, Dampelas Sub District of Donggala, Central Sulawesi Province

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Abstract: **The production forest area in the Dampelas Tinombo KPH (Forest Management Unit is an organization that works at the site level and is expected to be a prerequisite for the implementation of a sustainable and equitable forest management system) area which was included in the area of Parisan Agung Village, Dampelas District which was indicated to be damaged had an area of about 410 Ha, so that a study was needed on the composition and potential of production forest in Parisan Agung Village in order to plan the utilization and development of plantation forests that were aims to provide welfare for people living around forest areas without changing their main function. This research was carried out for 3 months starting from June to September 2018. The location of this research was in a production forest located in the Dampelas Tinombo KPHP Model area which was included in the Parisan Agung Village area, Dampelas sub district of Donggala, Central Sulawesi Province. The composition of forest vegetation types in Parisan Agung Village consisted of 28 types of vegetation. at the tree level in the plot as many as 165 individuals from 25 types of vegetation while the pole level vegetation as many as 140 individuals from 25 types of vegetation, at the sapling level as many as 145 individuals from 28 types of vegetation and seedling level as many as 154 individuals from 28 types of vegetation. While the potential volume of trees in the observation plot was 162.53 m^3 from 165 individuals, the type of bayas had the highest volume with 13. 17 m^3 and the volume of the pole level in the observation plot was 17.89 m^3 from 140 individuals, the prupuk species had a volume of 17.89 m^3. the largest with 1.63 m^3.**

Keywords: **composition of vegetation types, Parisan Village**

I. INTODUCTION

Forests as a national development capital have real benefits for the life and livelihood of the Indonesian people, both ecologically, socio-culturally and economically, in a balanced and dynamic manner. For this reason, forests must be managed and managed, protected and used sustainably for the welfare of the Indonesian people, both present and future generations.

The production forest, which was located in Parisan Agung Village, Dampelas District, Donggala Regency, Central Sulawesi is part of the Dampelas Tinombo KPHP management area in Donggala Regency which had a total area of 112,634 Ha. And what was included in the production forest area of Parisan Agung Village was an area of 410 hectares.

Forest natural resources have a very important role for sustainable development and people's lives. Forests could fulfill some of the many basic human needs, including the need for wood, water, food, medicine and healthy air. Forests could also be used as a tourist attraction, shelter, wildlife habitat, and as a place to conduct research.

According to the Law of the Republic of Indonesia Number 41 of 1999, forest is an ecosystem unit in the form of a stretch of land containing biological resources which is dominated by trees in their natural environment, which cannot be separated from one another. Based on their function, forests were divided into three groups, namely: Production Forest, which was a forest area that had the main function of producing forest products; Protected Forest, which was a forest area that had the main function as a life support system, preventing flooding, controlling erosion, preventing sea water intrusion and maintaining soil fertility; Conservation Forest, which was a forest area with certain characteristics that have the main function of preserving the diversity of plants and animals and their ecosystems.

The Forestry and Plantation Service of West Kalimantan Province (1999) revealed that the notion of forest must be distinguished into the notion of forest wealth, forest potential and forest resources. Forests were natural resources if the existence of the forest was not yet known about its potential, utilization and utilization technology. Forest was a potential if the benefits were known, the technology for its use was available but the basic potential was not yet available or not yet known. Forest was a resource if the biological and non-biological components and services contained in the forest have known potential, benefits and technology for their use and the market was available.

Based on the background described above, the following problems could be stated: What was the composition and potential of the tree level in the production forest area? What types of trees dominate in the production forest area?

The research purposes were: To determine the composition and potential of the tree level in the production forest area of the Dampelas Tinombo KPHP; To find out the types of trees that dominate the production forest area of KPHP Dampelas Tinombo.

II. RESEARCH METHODS

This research was conducted for 3 months starting from June to September 2014. The location of this research was in the production forest of Parisan Agung Village, Dampelas District, Donggala Regency, Central Sulawesi Province.

The tools and materials used in this research were: Raffia rope was used for making observation plots. The meter was used to measure the observation plot. GPS (global positioning system) was used to determine the coordinates of the observation plot. The meter tape was used to measure the diameter of the tree. Hagameter was used to measure tree height. A machete was used to open a path for plotting observations. Writing utensils (pencils/pens and books) were used as a means of recording things that were considered important in the research process. Camera as a documentation tool in the field and the tally sheet (also called a Check Sheet) is a very simple way to accumulate data about the frequency of occurrence of events.

Observation Plot Determination

This study uses the method (continuous line purposive sampling) that was by determining the continuous plot on the observation line measuring 200 m, and the distance between the observation plot lines was 100 m; and the number of research plots was 30 plots, each plot size was 20 x 20 m.

The shape and size of the observation lines and observation plots could be seen in the following figure:

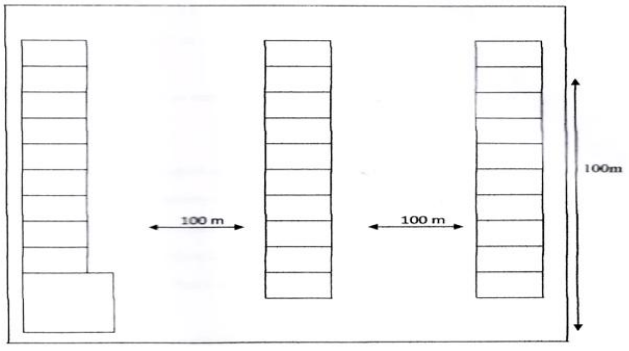

Figure 1. Shape and size of observation lines and observation plots

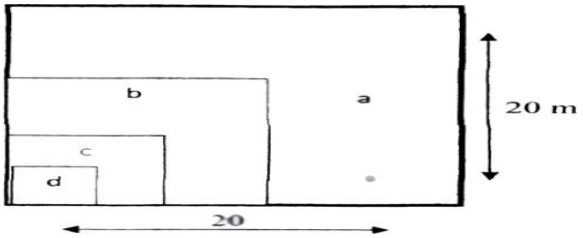

Figure 2. Shape and Size of Observation Sub Plot

Observation description:

a. Plot 20 mx 20 m for tree observat >20 cm)
b. Plot 10 m x 10 m plot for pole ol (DBH > 10-20 cm)
c. Plot 5 m x 5 m plot for stake observation (DBH < 10 cm height > 1.5 m)
d. Plot 2 mx 2 m for observation of seedlings (height < 1.5 m)

Data Analysis

The data obtained from observations in the field were then collected and further analyzed to determine the Important Value Index (INP). According to Soerianegara dm Indrawan (1983), the Important Value Index (INP) was obtained by adding up the quantities: Relative Density (KR), Relative Dominance (DR), and Relative Frequency (FR), as follows:

a. Density (K)

$$K = \frac{a\ species\ individuals\ number}{sample\ area}$$

b. Relative density (KR)

$$KR = \frac{a\ species\ density}{all\ species\ density} x100\%$$

c. Frequency (F)

$$F = \frac{plots\ number\ specified\ by\ a\ type}{all\ plots\ number}$$

d. Relative Frequency (FR)

$$FR = \frac{plots\ number\ specified\ by\ a\ type}{all\ plots\ number} x100\%$$

Determination of the dominance of a species was calculated based on the area of the base area using the following formula:

$$LBD = \frac{1}{4}\pi(\frac{d}{100})^2$$

Notes: LBD=Plane Area Wides, π=3.14 and d=Diameter

e. Dominance (D)

$$D = \frac{the\ total\ plane\ area\ of\ a\ species}{sample\ plots\ wides}$$

f. Relative dominance(DR)

$$DR = \frac{a\ species\ dominance}{all\ species\ dominance} x100\%$$

Importance value index (INP) for trees and poles = KR + FR + DR

Importance value index (INP) mob* sapling and seedling = KR + FR

Data analysis to determine vegetation potential was estimated by calculating the volume of trees and poles, while the volume formula was as follows:

$$V = d^2 x\ t\ x\ fk$$

Notes: V=Volume, π=3.14, d = Diameter, t=tree height and fk = correction factor (0.7)

III. RESULTS AND DISCUSSION

From the results of the identification of vegetation in the production forest in the village of Parisan Agung, Dampelas District, Donggala Regency, which was located at an altitude of 799 m above sea level. While the location of the first observation plot in this study was at the coordinates of N 34000000,000 and E 1060 520 30,0100, the following results were obtained: there were 28 types of vegetation from 30 observation plots made. The total population was 605 individuals.

At the tree level in the observation plot there were 165 individuals of 25 types of vegetation at the pole level as many as 140 of 25 types of vegetation, at the sapling level as many as 146 of 28 types of vegetation while at the seedling level there were 154 of 28 types of vegetation.

The results obtained from plot measurements on production forest in Parisan Agung Village with a total area of 120 m^2 for tree level could be seen in the table below.

Table 1. Vegetation Species Composition at the Trees Level

No	Local Name	Scientific name	Amount	KR(%)	FR(%)	DR(%)	INP(%)
1	Mommy	Santri leavigata	10	6.20	6.32	8.33	20.85
2	Malapoga	Melia sp	3	1.55	1.91	1.38	4.84
3	Togalana	Agathis philipinensis	13	7.75	7.66	8.33	23.74
4	Sugimanai	Anthocephalus cadamba	9	5.42	5.47	6.94	18,10
5	Tombo	Vatica flavovirens	5	3.10	3.06	1.38	7.54
6	Banggeris	Eucalyptus deglupta	4	2.32	2.49	1.38	6.19
7	Kayu Putih	Loptopetalum spp	13	7.75	8.23	6.94	22.92
8	Mamaku	Podocarpus rumphii	5	3.10	3.06	5.55	11.71
9	Kolaka	Parinari corymbosae	8	4.65	3.83	5.55	14.03
10	Suci	Myristica gronov	6	3.87	3.83	5.55	13.25
11	Mayapo	Macoranga hybrid	5	3.10	3.06	4.16	10.32
12	Bayur	Pterospemum celebica	6	3.87	3.83	2.77	10.47
13	Suri	Coordersiodendron P	6	3.87	3.83	4.16	11.86
14	Bintangor	Callophylum sp	9	5.42	5.47	4.16	15.32
15	Jambu	Kjellbergiondendron C	13	7.75	6.32	8.33	22.40
16	Karet	Palaquium sp	5	3.10	3.06	1.38	7.54
17	Maraula	Diosphioros macrophylla	8	4.65	4.98	4.16	13.79
18	Tabang	Lophocetalum sp	6	3.87	3.83	2.77	10.47
19	Silo	Canarium aspermum	5	3.10	3.06	1.38	7.54
20	Lengaru	Alstonia scholaris	5	3.10	3.06	2.77	8.93
21	Bolongita	Tetrameles nudiflora	3	1.55	1.91	2.77	6.23
22	Putemata	Unidentified	6	3.87	3.83	1.38	9.08
23	Simevava	Unidentified	2	0.77	1.12	1.38	3.29
24	Palapi	Heritiera javanica	5	3.10	3.06	1.38	7.54
25	Binuang	Octomeles sumatrana	5	3.10	3.06	5.55	11.71
	Amount		165	100	100	100	300

Based on Table 1 above, it could be concluded that the type of vegetation at the tree level that had the highest IVI was Togalana (*Agathisphilipipnensis*) with an IVI value of 23.74%, followed by the type of perupuk (*Lophopetalum sp*) with an IVI value of 22.92% and the type of guava (*Kjellbergiondendron celebicum*) with an INP value of 22.40%. While the lowest species at the tree level was the special species (Unidentified) with an INP value of 3.29%.

The results obtained from plate measurements in production forest in the village of Parisan Agung with a total area of 60 m2 for the pile level could be seen in table 2 below:

Table 2. Vegetation Species Composition of at Pile Level

No	Local Name	Scientific name	Amount	KR(%)	FR(%)	DR(%)	INP(%)
1	Mommy	Santri leavigata	7	4.93	4.66	3.70	13.29
2	Malapoga	Melia sp	3	2.24	2.33	3.70	8.27
3	Togalana	Agathis philipinensis	9	6.72	6.06	3.70	16.48
4	Sugimanai	Anthocephalus cadamba	7	4.93	3.36	3.70	13.99
5	Tombo	Vatica flavovirens	6	4.48	3.72	3.70	11.90
6	Banggeris	Eucalyptus deglupta	4	2.69	3.03	3.70	9.42
7	Kayu Putih	Loptopetalum spp	10	7.17	6.99	7.40	21.56
8	Mamau	Podocarpus rumphii	4	2.69	3.03	3.70	9.42
9	Kolaka	Parinari corymbosae	5	3.58	3.72	3.70	11.00

10	Suci	Myristica gronov	4	2.89	3.03	3.70	9.42
11	Mayapo	Macoranga hybrid	5	3.58	3.72	3.70	11.00
12	Bayur	Pterospemum celebica	5	3.58	3.03	3.70	10.31
13	Suri	Coordersiodendron P	8	5.82	4.66	3.70	14.18
14	Bintangor	Callophylum sp	7	4.93	5.36	3.70	13.99
15	Jambu	Kjellbergiondendron C	11	8.07	7.69	7.40	23.16
16	Karet	Palaquium sp	3	2.24	2.33	3.70	8.27
17	Maraula	Diosphioros macrophylla	7	4.93	4.66	3.70	13.29
18	Tabang	Lophocetalum sp	6	4.48	4.66	3.70	12.84
19	Silo	Canarium aspermum	5	3.58	3.72	3.70	11.00
20	Lengaru	Alstonia scholaris	4	2.69	3.03	3.70	9.42
21	Bolongita	Tetrameles nudiflora	3	2.24	2.33	3.70	8.27
22	Putemata	Unidentified	5	3.58	3.72	3.70	11.00
23	Simevava	Unidentified	4	2.69	3.03	3.70	9.42
24	Palapi	Heritiera javanica	4	2.69	3.03	3.70	9.42
25	Binuang	Octomeles sumatrana	4	2.69	3.03	3.70	9.42

Based on Table 2 above, it could be concluded that the type of vegetation at the pole level that had the highest IVI was guava (Kjellbergiondendron celebicum) with an INP value of 23.16%, followed by perupuk species (Lophopetalum sp) with an INP value of 21.56% and Togalana species. (Agathis philipipnensis) with an IVI value of 16.48%. While the lowest species at the pole level were bolangita (Tetrameles nudiflora), Nantu (Palaquium sp) and Malapoga (Melia sp) with a value of 8.27%.

The results obtained from plot measurements on production forest in Parisan Agung Village with a total area of 30 m2 for the sapling level could be seen in Table 3 below:

Table 3. Vegetation Species Composition at Sapling Level

No	Local Name	Scientific name	Amount	KR(%)	FR(%)	INP(%)
1	Mommy	Santri leavigata	8	5.42	5.66	11.08
2	Malapoga	Melia sp	3	2.08	2.17	4.25
3	Togalana	Agathis philipinensis	7	4.80	4.35	9.15
4	Sugimanai	Anthocephalus cadamba	7	4.80	5.01	9.81
5	Tombo	Vatica flavovirens	4	2.71	2.38	5.54
6	Banggeris	Eucalyptus deglupta	4	2.71	2.38	5.54
7	Pupuk	Loptopetalum spp	8	5.42	5.66	11.08
8	Mamaku	Podocarpus rumphii	4	2.71	2.38	5.54
9	Suci	Myristica gronov	5	3.34	2.38	6.17
10	Kolaka	Parinari corymbosae	6	4.17	3.48	7.65
11	Mayapo	Macoranga hybrid	6	4.17	4.35	8.52
12	Bayur	Pterospemum celebica	6	4.17	4.35	8.52
13	Suri	Coordersiodendron P	6	4.17	4.35	8.52
14	Jambu	Kjellbergiondendron C	9	6.26	6.53	12.79
15	Bintangor	Callophylum sp	8	5.42	5.66	11.08
16	Karet	Palaquium sp	4	2.71	2.83	5.54
17	Maraula	Diosphioros macrophylla	7	4.80	3.48	8.28
18	Silo	Canarium aspermum	4	2.71	2.83	5.54
19	Lengaru	Alstonia scholaris	6	4.17	4.35	8.52
20	Bolongita	Tetrameles nudiflora	3	2.08	2.17	4.25
21	Putemata	Unidentified	3	2.08	2.17	4.25
22	Simevava	Unidentified	3	2.08	2.17	4.25
23	Palapi	Heritiera javanica	4	2.71	2.83	5.54
24	Binuang	Octomeles sumatrana	4	2.71	2.83	5.54
25	Lambusu	Unidentified	4	2.71	2.83	5.54
26	Aga wood	Ficus sycomoroides	4	2.71	2.83	5.54
27	Uru wood	Elmirrilia ovalis	4	2.71	2.83	5.54
28	Mayapo	Macaranga hybrid	5	2.71	2.83	6.17
	Amount		146	100	100	100

Based on Table 3 above, it showed that the type of sapling vegetation that had the highest Important Value Index was the Bintangor (*Callophylum sp*) species with an INP value of 12.79% followed by the Nantu (*Palaquiron sp*), Perupuk (*Lophopetalum spp*) and Mompi (*Santiria leavigata*) species. with an INP value of 11.08%. While the lowest species at the sapling level were Malapoga (*Melia sp*) bolangita (*Tetrameles nudiflora*), Putemata (Unidentified) and simevava (Unidentified) with an INP value of 4.25%.

Important Value Index (INP) was an index of importance that describes the role of a type of vegetation in its ecosystem. If the INP of a vegetation type was of high value, then the type of vegetation was of high value, then the type of

This greatly affects the stability of the ecosystem. In order for the significance index to be interpreted in its meaning, the following criteria were used: the highest significant index value was divided by three so that the INP could be grouped

into three categories, namely high, medium and low (Fachrul, 2007).

The results obtained from plot measurements on production forest in Parisan Agung Village with a total area of 13.5 m2 for the seedling level could be seen in Table 4.

Table 4. Vegetation Species Composition at Seedling Level

No	Local Name	Scientific name	Amount	KR(%)	FR(%)	INP(%)
1	Mommy	Santri leavigata	9	5.84	5.06	10.90
2	Malapoga	Melia sp	4	2.56	2.86	5.42
3	Togalana	Agathis philipinensis	7	4.51	5.06	9.57
4	Sugimanai	Anthocephalus cadamba	7	4.51	5.06	9.57
5	Tombo	Vatica flavovirens	6	3.89	3.52	7.41
6	Banggeris	Eucalyptus deglupta	4	2.56	2.86	5.42
7	Fertilizer	Loptopetalum spp	6	3.89	3.52	7.41
8	Mamaku	Podocarpus rumphii	5	3.27	3.52	6.79
9	Suci	Myristica gronov	5	3.25	3.52	6.79
10	Kolaka	Parinari corymbosae	4	2.56	2.86	5.42
11	Mayapo	Macoranga hybrid	6	3.89	2.86	6.75
12	Bayur	Pterospemum celebica	7	4.51	4.40	8.91
13	Suri	Coordersiodendron P	7	4.51	5.06	9.57
14	Jambu	Kjellbergiondendron C	7	2.51	3.52	8.03
15	Bintangor	Callophylum sp	7	4.51	4.40	8.91
16	Karet	Palaquium sp	5	3.27	3.52	6.79
17	Maraula	Diosphioros macrophylla	5	3.27	3.52	6.79
18	Silo	Canarium aspermum	5	3.27	2,862.86	6.13
19	Lengaru	Alstonia scholaris	6	3.89	2.86	6.75
20	Bolongita	Tetrameles nudiflora	4	2.56	2.86	5.42
21	Putemata	Unidentified	4	2.56	2.86	5.42
22	Simevava	Unidentified	4	2.56	2.86	5.42
23	Palapi	Heritiera javanica	5	3.27	3.52	6.13
24	Binuang	Octomeles sumatrana	5	3.27	3.52	6.79
25	Lambusu	Unidentified	5	3.27	3.52	6.79
26	Aga wood	Ficus sycomoroides	5	3.27	3.52	6.79
27	Uru wood	Elmirrilia ovalis	5	3.27	3.52	6.79
28	Mayapo	Macaranga hybrid	5	3.27		6.79
	Amount		146	100	100	200

Table 4 showed that the type of seedling that had the highest IVI was Mompi (*Santiria leavigata*) with an INP value of 10.90% followed by Togalana (*Agathis philipipnensis*) with an INP value of 9.57% and Sugimanai species (*Anthochepalus cadamba*) with an INP value of 9.57. %.' While the lowest species at the seedling level were Malapoga (*Melia sp*), Putemata (Unidentified), Lengaru (*Alsionia scholaris*) and Bolangita (*Tetrameles nudiflora*) with an INP value of 5.42%.

Density was a factor that affects tree growth, if the density was high then the competition for nutrients and sunlight was getting bigger then a frequency value also describes the distribution pattern of a species in a habitat. If a species had a high frequency value, then the species will grow in a diffuse manner and preferably a species will grow in groups and a little if the frequency value was low.

The important value index was useful for determining the dominance of plant species over other plant species, because in a species that was heterogeneous, the individual vegetation parameter data from the frequency, density and dominance values cannot fully describe, so to determine the importance value had an attachment to the community structure. could be seen from the index of importance.

Species that have the largest important value index (INP) identify that the species had a wide distribution and dominated a forest area, according to (Mawazin and Subianto, 2013). The INP of a species showed the dominance of other types of community. Species that have the highest INP have a greater chance of maintaining growth and sustainability of their species.

Dominant species were species that were able to control the place to grow and develop themselves according to environmental conditions, which as a whole or most were at the top level of all species in a vegetation community (Fari and Sandan 2012).

Based on the relative dominance values, it could be concluded that the guava (*Kjellbergiondendron celebicum*), Perupuk (*Lophypetalum Sp*) and Togalana (*Agathis philipipnensis*) species dominate the tree and pole level vegetation in the production forest in the village of Parisan agung, while at the sapling and seedling level vegetation the The dominant species were Mompi (*Santria leavigata*), Bintangor (*Callophylum sp*), Perupuk (*Lophopetalum sp*), Nantu (*Palaquium sp*), Togalana (*Agathis philipipnensis*) and Sugimanai (*Anthochepalus cadamba*)

IV. CONCLUSION

Based on observations in the field, it could be concluded that the composition of vegetation types of

production forest in Parisan Agung Village consisted of 28 types of vegetation, at the tree level in the plot there were 165 individuals from 25 types of vegetation, while the pole level vegetation was 140 individuals from 25 types of vegetation, at the sapling level as many as 146 individuals from 28 types of vegetation and seedling level as many as 154 individuals from 28 types of vegetation.

The dominant vegetation types in the production forest were the Togalana (*Agathis philippinensis*) species at the tree level, the Guava species (*Kjellbergiondendron celebicum*) dominated at the pole level, the type Bintangor (*Callophylum sp*) dominated at the sapling level and the Mompi species (*Santiria leavigata*) dominated at the seedling level, it was known based on the highest value index (INP) for that vegetation type.

The potential of vegetation in production forests in the Dampelas Tinombo KPHP area, Parisan Agung Village, could be seen based on the volume of trees in the observation plot as many as 162.53 m^3 from 165 individuals, the Mompi species (*Santiria leavigata*) had the largest volume with 13.17 m^3 and a volume of 13.17 m^3. The pile level in the observation plot was 17.89 m^3 from 140 individuals, the Prupuk species (*Lophopetalum Spp*) had the highest volume with 1.63 m^3.

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