https://mail.yahoo.com/d/search/keyword=abdul/messages/1276?guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAAjxJ6TDcWAc666Qo65rsI-TjQ6SyZbOusWfnNlNeEZs6XW30Wk7bVeM0m_5YhCTxNo4qQFbHz1jbxERUKk-_ORDhjv6Wdw3XBS7yteN2jm77LUDeuY3i9q71e7jaTASJxoEc-UewSYMRPPcDMAb1MBsCv7B55tYeQ0i2nkKEk-h

[jwem] Editor Decision

Yahoo/Email Masuk

•

Prof. Abdul Hadi, Ph.D <abdhadi@unlam.ac.id>

Kepada: Pendidikan Biologi Dharmono Dharmono Dharmono

Sel, 29 Mei 2018 jam 16.47

Journal of Wetlands Environmental Management (JWEM)

Pendidikan Biologi Dharmono Dharmono Dharmono:

We have reached a decision regarding your submission to Journal of Wetlands

Environmental Management, "STUDY OF THE STRUCTURE OF THE TREES POPULATION IN THE MALUKA RIVERSIDE AS A SUBJECT MATTER TO DEVELOPMENT OF THE PLANTS

ECOLOGICAL HANDOUTS".

Our decision is: Revisions Required

Irfan Prasetia

Lambung Mangkurat University

iprasetia@unlam.ac.id

Less talk, write more

166-469-1-RV.docx

STUDY OF THE STRUCTURE OF THE TREES POPULATION IN THE MALUKA RIVERSIDE AS A SUBJECT MATTER TO DEVELOPMENT OF THE PLANTS ECOLOGICAL HANDOUTS

Dharmono[1], Mahrudin[2],
[1-2] Lambung Mangkurat University, Banjarmasin, Indonesia
*Corresponding author: dharmonoputra@yahoo.com;

ABSTRACT

The population in a plant can be recognized one of them is by know population structure. The riverside maluka of Tanah Laut District is the swamps and river found herbs having an important role to play in maintaining the structure of the soil from the erosion of the river running on the area. This research attempts to discription of population structure plants of the riverside Maluka. The kind of research used is research discription to technique the data using transect techniques, samples of set systematically on both its edges 1500 m along with wide its edges 2 m. The results of the research found 13 plants species crops trees with the differents structure of population. Plant having structure population shaped a polygon as 4 plants, namely; *Mangifera indica, Flacourtia rukam, Antidesma Ghaesembilla,* and *Melaleuca cajuputi.* Plants structured population on the basis wide as 6 plants, namely; *Gluta renghas, Acacia auriculiformis, Syzygium sp., Syzygium guineense, Pisonia sp., Cassia alata*. Plant having structure population the form of basins / pitcher as much as 2 plants, namely; *Mangifera casturi dan Fagraea crenulata.* Plant having the structure shaped polygons reversed population, namely; *Lagerstroemia speciosa.*

Keywords: *Population Structure, Crops, The riverside.*

1. INTRODUCTION

The population in a plant beyond recognition with the structure population and of these individuals morphology. According Odum (1993), based on the structure of his life, strutkur the population has three archetypes namely; 1) the pyramid with the bottom wide, 2) the pyramid of polygons or clapper, and 3) the pyramid of pitcher. Ecologically, the population generally haveing a triple forms to scatter the age of namely pre-reproductive, reproductive, post-reproductive. The length of the period of ecological age compared to age in length to vary greatly depending on the type of organisms and the environmental conditions that cover. According solue 1987 (Subahar, 1998) the structure of the population affected by a number of factors, namely; the environment is a place or habitats, and mortalitality, natalitality, and human activity.

The study on population structure is very important to determine what is the status or the state of being a given population plants in a habitats has the crisis, threatened, or secure. Research of the structure of the population at several species of plants in South Kalimantan had done all regions and the riverside the highlands and the lowlands of the riverside. The results of research on the riverside the highlands of namely; Syahdi et.al (2016) of the structure of

population (*Arenga pinnata* Merr.) shaped like a basic disturbed pyramid with the status of not critical. Meanwhile ~~the results of research~~ dharmono et.al (2016) reported that ~~of~~ the structure of the population crop native to different shaped the pyramid every plant and its status not critical.

The river of Maluka is one of the river low-lying areas that flows between the peat swamp forests on the right and left. The split swamp ~~this is~~ makes this river special different, namely the riverside or the parallel to the surface of the water of a river and of swamp forests in surrounding. The river of Maluka is very vulnerable to threat, in the form of ~~both~~ either disorder natural or human activity, there house the nearby and the opening of the woods around a watershed can cause narrowing and silting in the rivers. So that the population plants capable of living in its edges very important role in maintain its edges from the erosion water flow in rivers.

Based on the above analysis it should be implemented in the studies about plants in shallow waters of the river Maluka good from the structure of the its population is set to uncover the status in shallow waters of the river maluka plants, and an effort to use the area as a source of learning local potential .

2. RESEARCH METHOD

The research was used of the description research by receipt of the data systematically to technique of the receipt of the data using transek technique. Population in this research is of all the plants in the area of the riverside Maluka were selected from plants is stipulated in systematic on both the riverside along 1500 m with wide the riverside 2 m. Every the riverside made observation points total of 15 points with the distance between the point is 100 m. Every the point of observation made a quadrant size 100 m^2 are modified to 2 m x 50 m with the distance between the quadrant 50 m.

The population structure depends of the density on phase prereproductive (not flowering/fruitful), phase reproductive (flowering / fruitful), and phase postreproductive (no longer flowering / fruitful, die or damaged). The determination of the structure of the population and density depends on ??? Odum (1993). The status of the scarcity used based on IUCN (2014) in modified as follows: if > 25 individual adult / km^2 is critical, if individual 5-25 adult / km^2 is critical, and when < 5 individual adult / km^2 is critical.

3. RESULT AND DISCUSSION
3.1. Result

The Research results to structure population of 13 of plants found, namely M*angifera indica,Mangifera casturi, Gluta renghas, Acacia auriculiformis, Cassia device, Flacourtia rukam, Fagraea crenulata, Lagerstroemia speciosa, Syzygium guineense, Syzygium sp. An, Melaleuca cajuputi, Pisonia sp.,* and *Antidesma ghaesembilla* shown in 3 phase age at Maluka riverside as on a Table 1.

Table 1. Population structure of the Plants

No	Scientific names	The Structure of The Population	Ind/Ha
1	*Mangifera indica*	Pre-Reproductive	177,3
		Reproductive	98,5
		Post- Reproductive	37,6
2	*Mangifera casturi.*	Pre-Reproductive	98,0

| | | Reproductive | 135,7 |
| | | Post- Reproductive | 27,7 |

Table 1. continued

No	Scientific names	The Structure of The Population	Ind/Ha
3	*Gluta renghas*	Pre-Reproductive	253,3
		Reproductive	123,0
		Post- Reproductive	45,3
4	*Lagerstroemia speciosa*	Pre-Reproductive	9,5
		Reproductive	23,3
		Post- Reproductive	43,3
5	*Acacia auriculiformis*	Pre-Reproductive	73,5
		Reproductive	26,3
		Post- Reproductive	12,5
6	*Syzygium guineense*	Pre-Reproductive	243,3
		Reproductive	110,0
		Post- Reproductive	33,3
7	*Flacourtia rukam*	Pre-Reproductive	286,7
		Reproductive	200,0
		Post- Reproductive	73,3
8	*Cassia alata L.*	Pre-Reproductive	336,7
		Reproductive	53,3
		Post- Reproductive	66,7
9	*Pisonia* sp.	Pre-Reproductive	336,7
		Reproductive	143,3
		Post- Reproductive	53,3
10	*Syzygium* sp.	Pre-Reproductive	420,0
		Reproductive	253,3
		Post- Reproductive	90,0
11	*Antidesma Ghaesembilla*	Pre-Reproductive	360,0
		Reproductive	280,0
		Post- Reproductive	120,0
12	*Fagraea crenulata*	Pre-Reproductive	10,5
		Reproductive	23,3
		Post- Reproductive	63,3

Comment [i-[23]: Not in italic

Comment [i-[24]: Small letter g

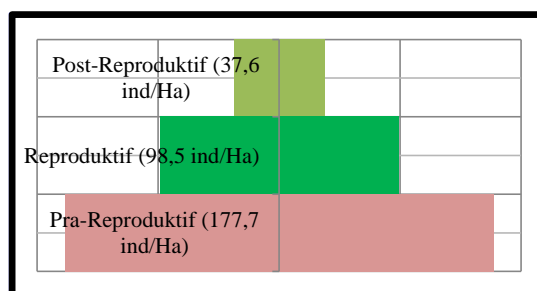| 13 | *Melaleuca cajuputi* | Pre-Reproductive | 435,0 |
| | | Reproductive | 263,3 |
| | | Post- Reproductive | 88,0 |

Table 3 shows, that the number of individual at pre-reproductive fase is greater than the reproductive fase, and the number of reproductive fase larger in size than indicated by plants post-reproductive *Mangifera indica, Gluta renghas, Acacia auriculiformis, Flacourtia rukam, Syzygium guineense, Syzygium sp ., Melaleuca cajuputi, Pisonia sp ., Antidesma ghaesembilla.* While Mangifera casturi and Pisonia sp. the number of individual at pra- reproductive fase smaller than on reproductive fase, and the number of reproductive fase that post- reproductive fase is greater than. The number of individual at pra- reproductive fase *Lagerstroemia speciosa* is greater than the reproductive fase, and the number reproductive fase is greater than post- reproductive fase.*Cassia alata* number of individuals in pre-reproductive fase greater than reproductive fase, and the number of reproductive fase smaller than post- reproductive fase. Meanwhile for *Fagraea crenulata,* number of individuals in pre- reproductive fase smaller than reproductive fase, and the number of reproductive fase smaller than post-reproductive fase.

3.2. Discussion

Based on the result analysis to structure the population data 13 species of plants in the area of the riverside Maluka based a age pyramid and a number of individuals/ha calculation, under the criteria of Odum (993) having different the form of a pyramid.

1. The Pyramid of Polygon

A plant which is having the structure of the population shaped a polygon as much as 4 plants, namely; Mangifera indica, Flacourtia rukam, Antidesma ghaesembilla, and Melaleuca cajuputi. The form of a pyramid polygon showed that those individuals young more than on an individual old (figure 1 to 4). According to Odum (1993) a pyramid polygon showed the percentage are between age group young and old. A population that containing a large part of individuals age young (pre-reproductive and reproductive) usually is the population the developing. According to Hardjosuwarno (1990) reported that in very simple terms a given population age structure to be stored developed quite population, characterized by a very large number of individuals young the proportion called also young population

Post-Reproduktif (37,6 ind/Ha)		
Reproduktif (98,5 ind/Ha)		
Pra-Reproduktif (177,7 ind/Ha)		

Picture 1. The structure Population Shaped of *Mangifera indica*

Picture 2. The structure Population Shaped of *Flacourtia rukam*

Picture 3. The structure Population Shaped of *Antidesma Ghaesembilla*
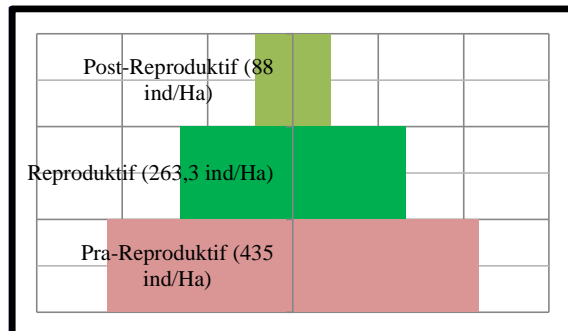
Picture 4. The structure Population Shaped of *Melaleuca cajuputi*

~~Based on divided according to the third phase,~~ it was found at the third phase that each of the population (*Mangifera indica, Flacourtia rukam, Antidesma ghaesembilla,* and *Melaleuca cajuputi*) has a distinctive age structure. This show every plants can survive ~~the either~~ in place, because adult or old plants can be replaced by plants young. This is shown by the results of the study, that the number of individual at phase pre-reproductive more of phase reproductive and post- reproductive.

2. The Pyramid of Basic Wide

Structured population of plants on the basis wide of about 6 plants, namely; Gluta renghas, Acacia auriculiformis, Syzygium sp ., Syzygium

guineense, Pisonia sp ., Cassia device. Pyramid age basic wide shaped (pictures 5 - 10) , is characterized by the number of phase pre-reproductive more than phase reproductive and post- reproductive or individual adult less found rather than an individual young in the area of its riverside of Maluka, the population the plant increased or flourish. It was this because young individuals are more than the individual years old, so that it can be said natality greater than mortality.

Post-Reproduktif (37,6 ind/Ha)

Reproduktif (98,5 ind/Ha)

Pra-Reproduktif (177,7 ind/Ha)

Picture 5. The structure Population Shaped of *Gluta renghas*

Post-Reproduktif (12,5 ind/Ha)

Reproduktif (26,3 ind/Ha)

Pra-Reproduktif (73,5 ind/Ha)

Picture 6. The structure Population Shaped of *Acacia auriculiformis*

Post-Reproduktif (53,3 ind/Ha)

Reproduktif (143,3 ind/Ha)

Pra-Reproduktif (336,7 ind/Ha)

Picture 7. The structure Population Shaped of *Syzygium sp.*

Comment [i-[45]: More ...(what)?

Comment [i-[46]: Change: birth rate

Comment [i-[47]: remove all lines in the grap decimal with .(dot) not ","
Reproduktif to "reproductive" for all
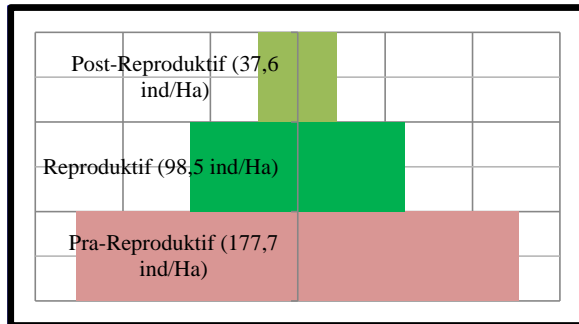
Comment [i-[48]: Change: Figure

Comment [i-[49]: Change: shape of populatio structure

Comment [i-[50]: remove all lines in the grap decimal with .(dot) not ","
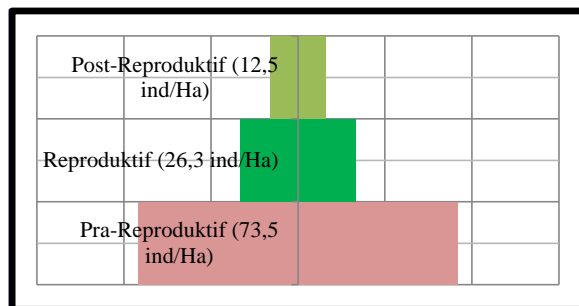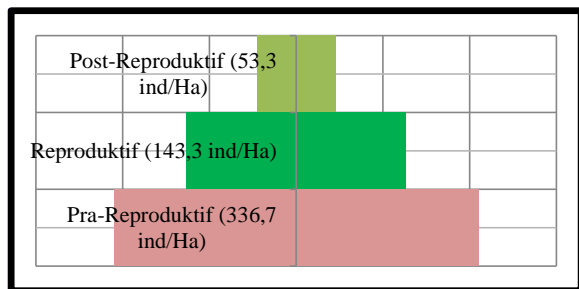Reproduktif to "reproductive" for all

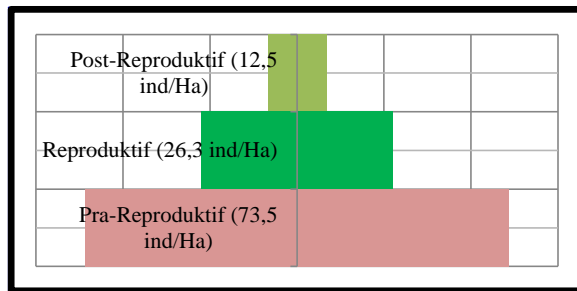**Comment [i-[51]:** Change: Figure

Comment [i-[52]: Change: shape of populatio structure

Comment [i-[53]: remove all lines in the grap decimal with .(dot) not ","
Reproduktif to "reproductive" for all

Comment [i-[54]: Change: Figure

Comment [i-[55]: Change: shape of populatio structure

Comment [i-[56]: Not in italic

Picture 8. The structure Population Shaped of *Syzygium guineense*

Picture 9. The structure Population Shaped of *Pisonia sp*.

Picture 10. The structure Population Shaped of *Cassia alata*

Usually an a population will fast growing if a part were dispersed from the population young consisting of individuals, a population that stable have the spread of the spreading age. According to the community have been many of the approximately 6 the tree cut down to building used as a means for example a bench for villagers. Plant of *Renghas gluta herbs, Acacia auriculiformis, Syzygium sp., Syzygium guineense, pisonia sp., Casia alata* can apparently, usually growing on moist soils especially on the edges of the river. Different environmental conditions not only change the spreading and the existence of a kind of just, but also the growth rates, fertility, that flash of, branching , to scatter leaves , range roots , and size of individual itself.

Comment [i-[57]]: remove all lines in the grap decimal with .(dot) not ","
Reproduktif to "reproductive" for all

Comment [i-[58]]: Change: Figure

Comment [i-[59]]: Change: shape of populatio structure

Comment [i-[60]]: Change: Figure
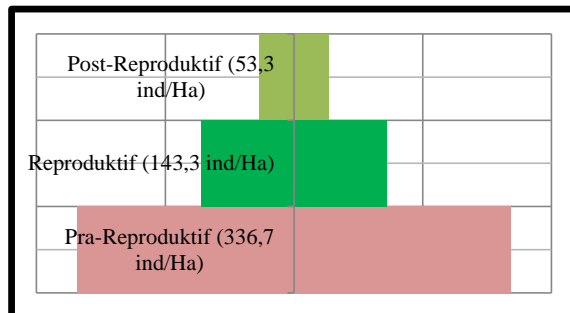
Comment [i-[61]]: Change: shape of populatio structure

Comment [i-[62]]: Not in italic

Comment [i-[63]]: remove all lines in the grap decimal with .(dot) not ","
Reproduktif to "reproductive" for all

Comment [i-[64]]: Change: Figure
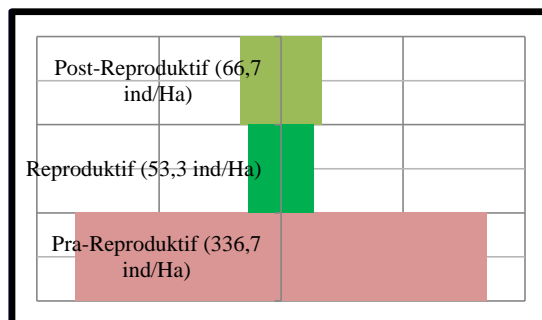
Comment [i-[65]]: Change: shape of populatio structure

Comment [i-[66]]: Rewrite correctly

Comment [i-[67]]: Not in italic
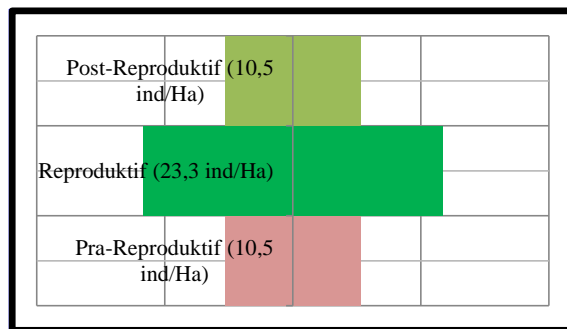
Comment [i-[68]]: Not in italic

Comment [i-[69]]: Write correctly

3. The Pyramid of Pitcher

Plant having the form of the population pitcher, namely; *Mangifera casturi* and *Fagraea crenulata*.The structure of the population *Mangifera casturi* and *Fagraea crenulata* in this area tend to lead in the form of a pyramid age the form of pitcher (pictures 11-12), because it shows the population number of individuals in phase pre-reproductive is less than phase reproductive and post-reproductive or number of individuals young fewer adult individuals. This means that both plants are being dropped. As described by Odum (1993), the pyramid a pitcher, shows the percentage low age group young and it is generally a typical for declining population.

Post-Reproduktif (27,7 ind/Ha)		
Reproduktif (135,7 ind/Ha)		
Pra-Reproduktif (98 ind/Ha)		
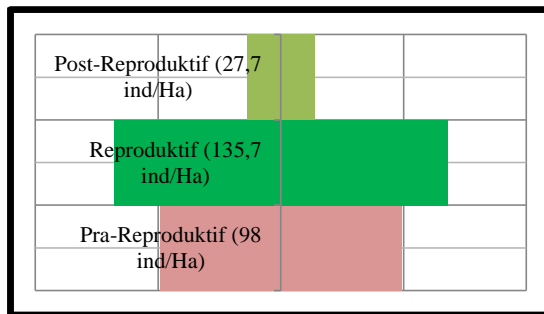
Picture 11. The structure Population Shaped of *Mangifera casturi*

Post-Reproduktif (10,5 ind/Ha)		
Reproduktif (23,3 ind/Ha)		
Pra-Reproduktif (10,5 ind/Ha)		

Picture 12. The structure Population Shaped of *Fagraea crenulata*

Based on the research done the number of phase pre-reproductive a little more than reproductive and post-reproductive phase. It is suspected that this induced in phase *reproductive* to post-*reproductive* phase very slow in its growth. So that pre-*reproductive* phase who grows up to be a mast collected *reproductive* phase with a beginning that slowly growing into post-*reproductive* phase. Its impact is *reproductive* phase having an amount greater than pre-*reproductive* phase and post-reproductive.

4. Inverted of Polygon Pyramid

A plant which is having the structure of the population shaped a Inverted of Pyramid Polygon is *Lagerstroemia speciosa*. The form of a Inverted of Pyramid Polygon showed that a little more than young individuals on an individual old (figure 13). It was different in structure or not find at Odum classifications population.

Comment [i-[70]: delete

Comment [i-[71]: in

Comment [i-[72]: is

Comment [i-[73]: remove all lines in the graph decimal with .(dot) not ","
Reproduktif to "reproductive" for all

Comment [i-[74]: Change: Figure

Comment [i-[75]: Change: shape of population structure

Comment [i-[76]: remove all lines in the graph decimal with .(dot) not ","
Reproduktif to "reproductive" for all

Comment [i-[77]: Change: Figure

Comment [i-[78]: Change: shape of population structure

Comment [i-[79]: delete

Comment [i-[80]: Change: is slight higher

Comment [i-[81]: Change: that

Comment [i-[82]: Make it clear

Comment [i-[83]: Change: is slight higher

Comment [i-[84]: Rewrite make it clear

Comment [i-[85]: Change: the results are not comply with Odum's criteria.

According to Odum (1993) stated that a pyramid a polygon showed the percentage are between age group young and old. A population that containing a large part of individuals age young (pre-reproductive and reproductive) usually is the population the developing. Based on the according to the third phase, found that the *Lagerstroemia speciosa* have grown typical structure.This suggests this plant prone to can survive on the spot, because of adult or old can be replaced by plants young with numbers little. Hardjosuwarno (1990) according in very simple terms a given population age structure to be stored developed quite population, characterized by a very large number of individuals young the proportion called also young population.Thus the condition of *Lagerstroemia speciosa* is declining.

Post-Reproduktif (43,3 ind/Ha)			
Reproduktif (23,3 ind/Ha)			
Pra-Reproduktif (9,5 ind/Ha)			
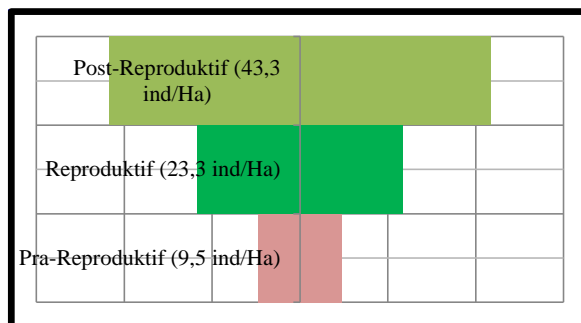
Picture 12. The structure Population Shaped of *Lagerstroemia speciosa*

The structure of the population of influenced by several factors, such as namely: (1) *Mortality*
mortality in factors affecting structure population of about its Maluka riverside were caused by the case is happened in the area. Resosoedormo, et.al (1992) according mortality is the death in a population. Of the incident which led to the plant in the population.This is showed by the invention of the former tree as a result of the forest fires earlier. The Ministry of Environmental (2015) a result of forest fires can cause death upon vegetation. When the heat produced is still possible vegetation life, will be left wounds the accident that will eventually stimulate growth pest and disease or producing permanently disabled. Consequence, every forest will be reduced and function forest would be lost. For phase pre-reproductive, trees has a young plant, it will cause death directly. In addition, the two of the recipient plants having a wooden structure good, so that many used as the planks of especially in post-reproductive phase. This is what causes the thing a number of individuals in post-reproductive phase was low.
(2) *The birth* natality
Resosoedormo, et.al (1992) according, population has the characteristic of typical for groups which lack by each individual its members, the population growing when natality exceeds mortality. In the population *Mangifera casturi* and *Fagraea crenulata* pre-reproductive phase less growth rate, it is suspected because the fruit of this plant most used, so that its seeds there were only few under the tree but when the grain adult and be taken and led him out of the investments. This is what is also affecting the birth rate of that of this plant due

Comment [i-[86]: remove

Comment [i-[87]: rewrite to make clear

Comment [i-[88]: remove all lines in the graph decimal with .(dot) not "," Reproduktif to "reproductive" for all

Comment [i-[89]: Change: Figure

Comment [i-[90]: Change: shape of population structure

Comment [i-[91]: Change: is

Comment [i-[92]: Change: stated that

Comment [i-[93]: Change; reported that

to the amount of pre-reproductive population fewer. The Phase pre-reproductive that is grown around their parents this does not have enough space each other, so there competition in search of a riot gear and water for growth. The Phase pre-reproductive received the confusion and the water sufficient will continue to grow into phase reproductive, while phase pre-reproductive who did not get the confusion and the water sufficient will lose and died. The phase reproductive plants were quite long or longer, so growth and development of phase pre-reproductive many accumulated in this phase. While the death of the latter that of this plant at reproductive phase was low.This is the reason why the number of individual thing at reproductive phase was always going to grow and the more.

(3) *environment abiotik*
Abiotict factor significant roles once for plants in the study areas, it is like the temperature of the air abiotik factors, soil pH , soil moisture, air moisture, velocity of the wind, the intensity of light, and organic land. Those abiotict factors is very influential and really important for the spread of herbs or distribution. This is in accordance with the opinions of Michael (1995) stated that abiotict factors can serve as restricting factors on the growth of and the distribution of plant. Based on the data environmental factors, there are some research environmental parameters be restricting factors such as; the intensity of light ranges from 2518-20000 lux, wind speed ranges from 0,0-1,2 m/s, moisture land ranges from 78-100 %. While the parameters not be restricting factors among others, the temperature ranges from 28 – 330 ^{0}C, moist air ranges from 78-80 %, ph land ranges from 5,2-6,8, N mineral 0,25 %, P mineral the area around 0,01 %.

The structure of the population always changing according to time, one factor causing the changes is human activity (surasana & Taufikurrahman, 1994). According to the interviews, usually the community cut down ones are old and plant deciding to section of the test the its bark used as wood and the building material for example to board and also the fruit of forest within the region usually not all is harvested to consumed and sold to execute so that many who are falling and grow up to be pre-reproductive phase. To the presence of many pre-reproductive phase signifying that the seeds of which are fall most are being shoots.The fruit of which is fully ripe also can usually taken by monkey, a squirrel, birds and bats, but the only eat the flesh of its fruit only , its seeds will be left alone, it falls to the ground and communities rarely take advantage of seeds. It falls to the ground seeds have the opportunity to grow into a shoots at a situation fully in line to its growth.Thus found a lot shoots.

IUCN (2014) categorizes scarcity of a plant as seen from a number of individuals than the adults in 1 km2. A critical state if in 1 km2 found less than 25 individual adults and when less than 5 individual adult called isthmus.Thus 13 plants of the the Maluka riverside area of not critical, because they were so many there are a lot of.

4. CONCLUSION
The results of the research found 13 plants species crops tree with the differents structure population. Plant having structure shaped polygon population of about 4, namely; *Mangifera indica, Flacourtia rukam, Antidesma ghaesembilla,* and *Melaleuca cajuputi*. Plants structured population on the basis of wide is 6 plants, namely; *Gluta renghas, Acacia auriculiformis, Syzygium sp., Syzygium guineense, Pisonia sp.,* and

Comment [i-[94]: Too long, make it shorter in 2 sentences to make it clear what you mean

Comment [i-[95]: separate

Comment [i-[96]: rewrite correctly

Comment [i-[97]: '2' write in 'square' form

Comment [i-[98]: Write to make clear

Cassia device. Plant having the population structure a pitcher, namely; *Mangifera casturi* and *Fagraea crenulata*. Plants the structure of the population shaped a inverted of pyramid polygon is *Lagerstroemia speciosa*. Based on this research, the potential of the population in Maluka riverside can be developed to become teaching materials.

5. ACKNOWLEDGMENT

6. REFERENCES

Susandi, Oksana, Arminudin AT. 2015. Analisis Sifat Fisika Tanah Gambut pada Hutan Gambut di Kecamatan Tambang Kabupaten Kampar Provinsi Riau. *Jurnal Agroteknologi*, 5(2): 23-28.

Pelletier V, Gallichand J, Gumiere S, Pepin S, Caron J. 2015. Water Table Control for Increasing Yield and Saving Water in Cranberry Production. *Journal of Sustainability* 7: 10602-10619. http://dx.doi.org/10.3390/su70810602

Comment [i-[99]: In this section you should mentioned what the advantages and disadvantages of different population structure of the plants for their applications.

Comment [i-[100]: Its better make it simple as example given. No need to write a lot of words.

Barbour, M.G., J.H. Burk, & W.D. Pitts. (1987). *Terrestrial Plant Ecology*. California: The Benjamin/Cummings Publishing Company, Inc.

Dharmono, Riefani M.K, Mahrudin. (2016). The Structure of The Population of Region of Kalang Village. *Article of The 1ˢᵗ International Conference on Innovation And Commercialization of Forest Product"*. Lambung Mangkurat University, Faculty of Forestry.

IUCN. (2014). *The Red List of Betulaceae. Botanic Gardens Conservation International*, UK.

Michael. (1995). *Metode Ekologi untuk Penyelidikan Ladang dan Laboratorium*. Jakarta: UI Press.

Odum, E. P. (1993). *Dasar-Dasar Ekologi Edisi Ketiga*. Yogyakarta: Gadjah Mada University Press.

Subahar, T. (1998). *Struktur Dan Pola Penyebaran Dispersal (Distribusi Populasi).* ITB Bandung.

Syahdi, Dharmono, Muchyar. (2016). *Prosiding Seminar Universitas Lambung Mangkurat 2016 "Potensi, Peluang, dan Tantangan Pengelolaan Lingkungan Lahan Basah Secara Berkelanjutan"* Struktur Populasi Tumbuhan Aren (*Arenga pinnata* Merr.) di Kawasan Wisata Air Terjun Rampah Manjangan Lokado. ISBN: 978-602-9092-91-2. Lambung Mangkurat University Press.

Hardjosowarno, S. (1990). Dasar-Dasar Ekologi Tumbuhan. Fakultas Biologi UGM, Yogyakarta.

Resosoedarmo, S. Kuswata K., Apriliani S. (1990). *Pengantar Ekologi*. Bandung, PT Remaja Rosdakarya.

Kementrian Lingkungan Hidup dan Kehutanan. (2015). *10 Profil Lokasi Taman Kehati.* Jakarta

Michael. (1995). *Metode Ekologi untuk Penyelidikan Ladang dan Laboratorium*. Jakarta: UI Press

Surasana, E.S., Taufikkurrahman. (1994). *Pengantar Ekologi Tumbuhan*. ITB, Bandung

Comment [i-[101]: See the above examples yellow highlight. Revised them.

https://mail.yahoo.com/d/search/keyword=ijwem/messages/1445?guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAAjxJ6TDcWAc666Qo65rsI-TjQ6SyZbOusWfnNlNeEZs6XW30Wk7bVeM0m_5YhCTxNo4qQFbHz1jbxERUKk-_ORDhjv6Wdw3XBS7yteN2jm77LUDeuY3i9q71e7jaTASJxoEc-UewSYMRPPcDMAb1MBsCv7B55tYeQ0i2nkKEk-h

[jwem] STUDY OF THE STRUCTURE OF THE TREES POPULATION IN THE MALUKA RIVERSIDE AS A SUBJECT MATTER TO DEVELOPMENT OF THE PLANTS ECOLOGICAL HANDOUTS

Yahoo/Email Masuk

Prof. Abdul Hadi, Ph.D <abdhadi@unlam.ac.id>

Kepada: Dharmono Dharmono Dharmono

Cc:atakhadi@gmail.com

Kam, 27 Des 2018 jam 13.26

Journal of Wetlands Environmental Management (JWEM)

Dear Dr. Dharmono

This is a gentle reminder from us. Your submission to Journal of Wetlands Environmental Management, "STUDY OF THE STRUCTURE OF THE TREES POPULATION IN THE MALUKA RIVERSIDE AS A SUBJECT MATTER TO DEVELOPMENT OF THE PLANTS ECOLOGICAL HANDOUTS", has been reviewed and our decision is: Revisions

Required.

In addition, to speed up the publishing process, we would like to invite

authors, which their manuscript will be published on January 2019 issue, to

attend layout and publication meeting that will be held at 31 December 2018.

The invitation letter could be seen on the attachment file.

We greatly appreciate your attendance at this meeting, so that your

manuscript can be included in the January 2019 issue.

Less talk, write more

- **STUDY ON THE STRUCTURE OF THE TREES POPULATION IN THE MALUKA RIVERSIDE AS A SUBJECT MATTER TO DEVELOPMENT OF THE PLANTS ECOLOGICAL HANDOUTS**

- **Dharmono[1], Mahrudin[2],**
  - [1-2] Lambung Mangkurat University, Banjarmasin, Indonesia
    - *Corresponding author: dharmonoputra@yahoo.com;

- **ABSTRACT**

- Understanding the population structure is one of the best ways to recognize the population in a plant as a whole. The riverside *Maluka of Tanah Laut District* is the swamps and river found herbs having an important role to play in maintaining the structure of the soil from the erosion of the river running on the area. Employing the descriptive method, this research attempts to describe population of structure plants of the riverside Maluka. The sample of structure plants are those on both edges of the riverside, namely: 1500 meters long and 2 meters wide. The data were collected by using the transect The results showed that there were 13 plants species trees with the different population structure. There are four plants with population structure of polygonnamely; *Mangifera indica, Flacourtia rukam, Antidesma Ghaesembilla,* and *Melaleuca cajuputi. There are six plants of width-based population structure of width,* namely; *Gluta renghas, Acacia auriculiformis, Syzygium sp., Syzygium guineense, Pisonia sp., Cassia alata*. There are two plants in the forms of basin or pitcher, namely; *Mangifera casturi dan Fagraea crenulata*. Plants that have population structure of reversed polygon is called *Lagerstroemia speciosa.*

- Keywords: *Population Structure, Crops, The riverside.*

- **1. INTRODUCTION**
- The population of plants can be identified through population structure and morphology of their individuals. According to Odum (1993), based on age structure, population structure has three basic patterns namely; 1) pyramid with the wide base, 2) pyramid in the form of polygon or clapper, and 3) pyramid in the form of pitcher or jar. Ecologically, the population generally has three forms of age-based distribution, namely: pre-reproductive, reproductive, and post-reproductive ages. The length of the ecological age period when compared to the length of living age varies greatly depending on the type of organism and environmental conditions that surround it. According to Solue 1987 (Subahar, 1998) population structure is influenced by several factors, i.e the environment as a place or habitat, natality and mortality, and human activities.
- The study on population structure is very important to determine what is the status or the state of being a given population plants in a habitats has

the crisis, threatened, or secure. Research of the structure of the population at several species of plants in South Kalimantan has been carried out in all regions and the riversides of the highlands and the lowlands of the riverside. The research on the riversides of the highland conducted by Syahdi et al (2016) elaborated the population structure of *Arenga pinnata* Merr in the form of base pyramid bushy with uncritical status. Meanwhile, the research result of Dharmono *et al* (2016) elaborated that the population structure of the original plant stands in the different shapes of pyramids of each plant, all of which are non-critical statuses.

- The Maluka River is one of the lowland rivers flowing between peat swamp forests on the right and left sides. The such location of rives makes it have a special feature, namely: riverbanks are parallel to the surface of river water and swamp forest around it. The Maluka River is highly vulnerable to threats, either from natural disturbances or human activities. Also, the housing development around the river and the opening of forests around the watershed may cause narrowing and silting of the river. So that the existence of plant populations being able to grow on the banks of the river is very important for maintaining the river banks from the erosion as a result of flowing river water.
- Based on the description, it is necessary to research about plants at the Maluka river bank both from their population structure which aims to find out the status of plants on the Maluka river bank and efforts to utilize the area as a potential local-based learning resource.
-
- **2. RESEARCH METHOD**
- This research used descriptive research. A research to know the structure of plant population is a descriptive research using the transect data collection technique. The population of this research was all the plants in the Maluka riverbanks; the samples of which were systematically determined on both banks of the river along the 1500 m in the width of 2 m. Each river was led by 15 points with distance between the points of 100 m. In each point of observation was made a quadrant with the size of 100 m2 modified into 2 m x 50 m with the distance between the quadrants in 50 m.
- The population structure depends of the density on pre-reproductive phase (not flowering/fruitful), reproductive phase (flowering / fruitful), and post-reproductive (no longer flowering / fruitful, die or damaged). The determination of the structure of the population and density depends on Odum's formula (1993). The status of the scarcity used was based on International Union For the Conservartion of Nature and Natural Resources (IUCN) (2014), that was modified as follows: if > 25 individual adult / km^2 is critical, if individual 5-25 adult / km^2 is critical, and when < 5 individual adult / km^2 is critical.
-
- **3. RESULT AND DISCUSSION**
- **3.1. Result**
- A total of 13 structured population plants were found in the Maluka river namely M*angifera indica,Mangifera casturi, Gluta renghas, Acacia auriculiformis, Cassia device, Flacourtia rukam, Fagraea crenulata, Lagerstroemia speciosa,*

Syzygium guineense, Syzygium sp.*, Melaleuca cajuputi, Pisonia* sp.*,* and *Antidesma ghaesembilla* shown in 3 phase age at Maluka riverside as on a Table 1.

-

- Table 1. Population Structure of the Plants

| No	Scientific names	The Structure of The Population	Ind/Ha
1	*Mangifera indica*	Pre-Reproductive	177.3
		Reproductive	98.5
		Post- Reproductive	37.6
2	*Mangifera casturi.*	Pre-Reproductive	98.0
		Reproductive	135.7
		Post- Reproductive	27.7
3	*Gluta renghas*	Pre-Reproductive	253.3
		Reproductive	123.0
		Post- Reproductive	45.3
4	*Lagerstroemia speciosa*	Pre-Reproductive	9.5
		Reproductive	23.3
		Post- Reproductive	43.3
5	*Acacia auriculiformis*	Pre-Reproductive	73.5
		Reproductive	26.3
		Post- Reproductive	12.5
6	*Syzygium guineense*	Pre-Reproductive	243.3
		Reproductive	110.0
		Post- Reproductive	33.3
7	*Flacourtia rukam*	Pre-Reproductive	286.7
		Reproductive	200.0
		Post- Reproductive	73.3
8	*Cassia alata L.*	Pre-Reproductive	336.7
		Reproductive	53.3
		Post- Reproductive	66.7
9	*Pisonia* sp.	Pre-Reproductive	336.7
		Reproductive	143.3
		Post- Reproductive	53.3
10	*Syzygium* sp.	Pre-Reproductive	420.0
		Reproductive	253.3
		Post- Reproductive	90.0
11	*Antidesma Ghaesembilla*	Pre-Reproductive	360.0
		Reproductive	280.0
		Post- Reproductive	120.0
12	*Fagraea crenulata*	Pre-Reproductive	10.5
		Reproductive	23.3
		Post- Reproductive	63.3
13	*Melaleuca cajuputi*	Pre-Reproductive	435.0
		Reproductive	263.3
		Post- Reproductive	88.0

-

- Table 1 shows. that the number of individual at pre-reproductive fase is greater than the reproductive fase. and the number of reproductive fase larger in size than indicated by plants post-reproductive *Mangifera indica. Gluta renghas. Acacia auriculiformis. Flacourtia rukam. Syzygium guineense. Syzygium* sp .. *Melaleuca cajuputi. Pisonia* sp .. *Antidesma ghaesembilla.* While *Mangifera casturi* and *Pisonia sp*. shows that the number of individuals on pre-reproductive phase are smaller than reproductive one, and the reproductive quantity is greater than the post-reproductive one. For *Lagerstroemia speciosa*, the number of individuals on pre-reproductive phase is greater than reproductive one, and the reproductive quantity is greater than the post-reproductive one. In *Cassia alata*, the number of individuals on pre-reproductive phase is greater than reproductive one, and the reproductive quantity is less than the post-reproductive one. Meanwhile, in *Fagraea crenulata*, the number of individuals on the pre-reproductive phase is less than the reproductive one, and the reproductive quantity is less than the post-reproductive one.
-
- **3.2. Discussion**
- Based on the results of data analysis on the population structure of 13 species of standing plants in the Maluka River area on the basis of the pyramid of age and calculation of the number of individuals per hectare using Odum's criterion (1993), they have different pyramid shapes.
-
- 1. The Pyramid of Polygon
- There were four plant populations that have polygon-shaped structures, namely: *Mangifera indica. Flacourtia rukam. Antidesma ghaesembilla*. and *Melaleuca cajuputi*. The polygon pyramid shape showed that younger individuals are larger than the elderly individuals (Fig. 1 - 4). According to Odum (1993) polygon pyramid showed a moderate percentage between young and old group of ages. The population that contained large portions of young (pre-reproductive and reproductive) individuals were usually the growing population. According to Hardjosuwarno (1990), in a simple way the age structure of population can be regarded as the quietly growing population, marked by the number of young individuals with very large proportions. These are also called the young population.
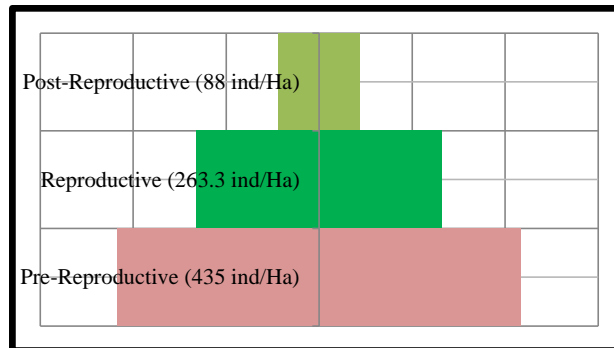-
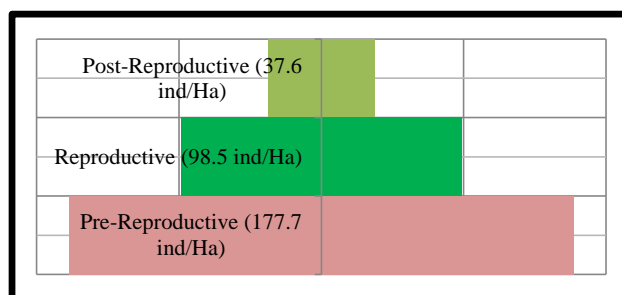
-
- Figure 1. The Shape of Population Structure of *Mangifera indica*
-
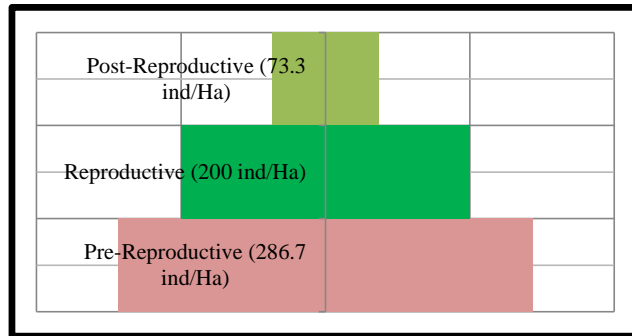
-
-
- Figure 2. The Shape of Population Structure of *Flacourtia rukam*
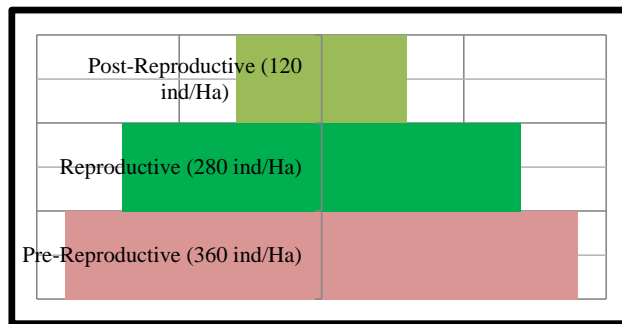

-
-
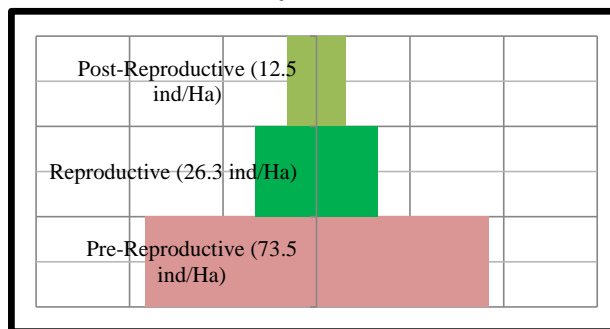- Figure 3. The Shape of Population Structure of *Antidesma Ghaesembilla*

-
-
- Figure 4. The Shape of Population Structure of *Melaleuca cajuputi*
-
- It was found at the third phase that each of the population (*Mangifera indica. Flacourtia rukam. Antidesma ghaesembilla.* and *Melaleuca cajuputi*) has a distinctive age structure. This show every plants can survive in place. because adult or old plants can be replaced by plants young. This is shown by the results of the study. that the number of individual at phase pre-reproductive more of phase reproductive and post- reproductive.
- Beberapa peneliti melaporkan,

- 2. The Wide Base Pyramid
- There are 6 plants that have a population structure with the wide base, namely; *Gluta renghas, Acacia auriculiformis, Syzygium sp., Syzygium guineense, Pisonia sp., Cassia alata*. The wide base pyramid (Fig. 5 - 10), characterized by pre-reproductive phase is more than that of reproductive phase, and by post-reproductive phase or adult individuals is found fewer than younger individuals. This means that the population of plants in the area of Maluka riverbanks are increasing or developing from time to time. This is because younger individuals are more than adults and older adults. So it can be said that natality is bigger than mortality.
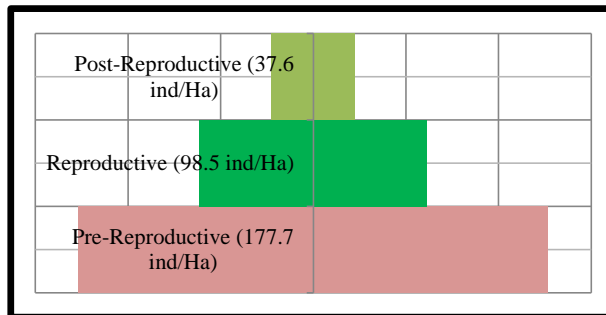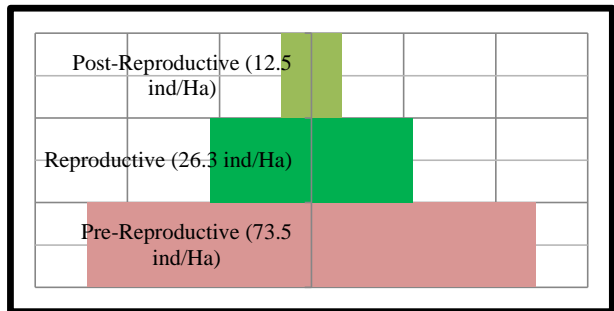

-
- Figure 5. The Shape of Population Structure of *Gluta renghas*
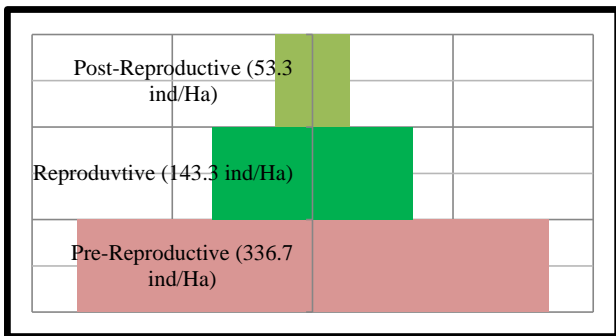-
-

-
- Figure 6. The Shape of Population Structure of *Acacia auriculiformis*
-
-
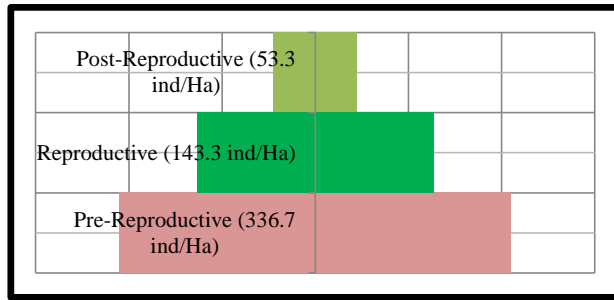
Figure 7. The Shape of Population of *Syzygium* sp

Figure 8. The Shape of Population of *Syzygium guineense*

Figure 9. The Shape of Population of *Pisonia* sp.

-
  - Figure 10. The Shape of Population of Cassia alata
-
- Usually a population will be growing fast if a part is dispersed from the population consisting of young individuals. Stable population has an even age distribution.. According to the information given by the informants, there were about 6 trees that were cut down and made use for the building materials by the villagers of Sungai Jelai. The plants of *Gluta renghas*, *Acacia auriculiformis*, *Syzygium sp.*, *Syzygium guineense*, *Pisonia sp.*, *Cassia alata* usually grow on the moist soil, especially on the banks of the river. Different environmental conditions do not only change the spread and existence of a plant species, but also these change the rate of growth, fertility, extent, branching, leaf distribution, root range, as well as individual size.
- **3.** The Pyramid of Jug
- There are two plants which have a population structure in the shape of pasu / jug, namely; *Mangifera casturi* and *Fagraea crenulata*. The population structure of the *Mangifera casturi* and the *Fagraea crenulata* in this region tends to lead to the shape of the age pyramid in the shape of the pasu or jug (Fig. 11-12), because it indicates the population of individual pre-reproductive phase numbering lesser than the reproductive and post-reproductive phases, or the number of younger individuals are lesser than those of adult individuals. This means both plants are decreasing. As Odum (1993) points out, the pyramid in the shape of pasu / jug shows a low percentage of young age groups and generally this one is a characteristic of a declining population.

-
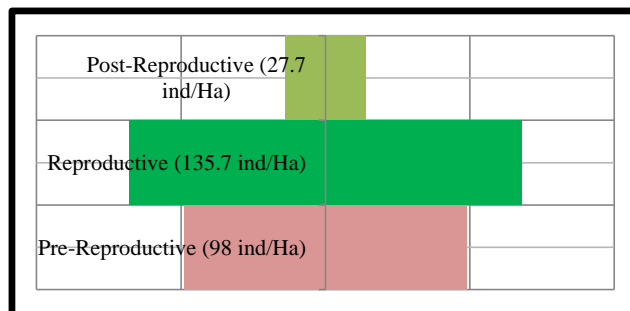
-
  -
- Figure 11. The Shape of structure population of *Mangifera casturi*
  -

Post-Reproductive (10.5 ind/Ha)				
Reprodutive (23.3 ind/Ha)				
Pre-Reproductive (10.5 ind/Ha)				
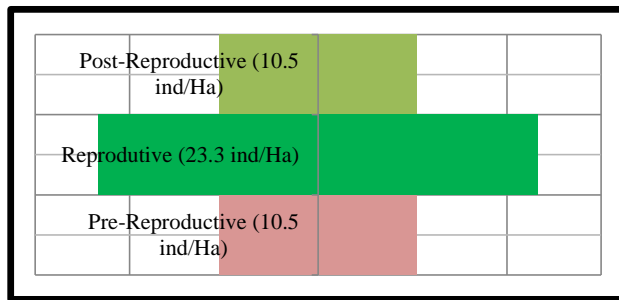
-
  -
- Figure 12. The Shape of population structure of *Fagraea crenulata*
-
- The number of pre-reproductive phase is slightly higher than reproductive and post-reproductive phases. This is assumed that it is caused by the very slow growth from *reproductive* phase to post-*reproductive* one. So that pre-*reproductive* phase that grows up to be a mast *reproductive* phase collected with a beginning pole phase growing slowly into post-*reproductive* phase. Its impact is that *reproductive* phase has a greater amount than pre-*reproductive* and post-reproductive phases.

-
- 4. Inverted of Polygon Pyramid
- Plants that have an inverted Polygon-shaped population structure are *Lagerstroemia speciosa*. The shape of an inverted polygon pyramid shows that younger individuals are fewer than the elder individuals (Figure 13). It is different or it is not found in the classification of population structure as suggested by Odum. According to Odum (1993) polygon pyramid shows a moderate percentage between young and old age groups. A population that contains large portions of young (pre-reproductive and reproductive) individuals is usually a growing population. According to Hardjosuwarno (1990), in a simple way the age structure of a population regarded as a growing population is marked by the number of young individuals with very large proportions. This is also called the young population. Thus the condition of the *Lagerstroemia speciosa* plant is decreasing.

-

Post-Reproductive (43.3 ind/Ha)				
Reproductive (23.3 ind/Ha)				
Pre-Reproductive (9.5 ind/Ha)				
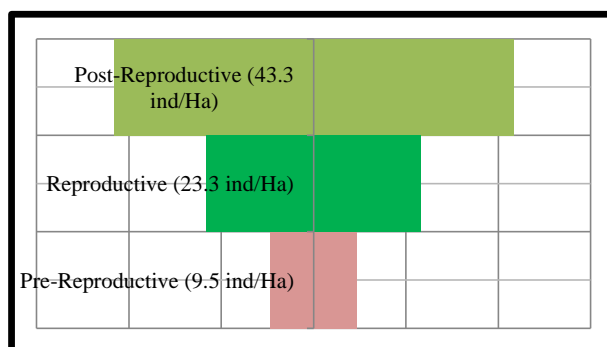
-
  -
- Figure 12. The shape of population structure of *Lagerstroemia speciosa*

-
- The structure of the plant population is influenced by several factors, namely:
- 1) **Mortality.**
- Mortality affecting the population structure of plants around the banks of the Maluka river are assumed to be caused by the fire that occurred in the area. According to Resosoedormo, et al (1992) mortality is the death rate in a population of plant. The occurrence of these fires resulted in the reduction in population of plants. This was indicated by the findings of remains of trees due to previous forest fires. According to the Ministry of Environment (2015) the consequences of forest fires can cause death in vegetation. If only the heat occurs as a result of the forest fires, vegetation may still be able to live. If this happens, the vegetation will be injured. Injured vegetation is susceptible to pests and diseases, and then results in permanent disability. Consequently, each forest will decrease and the function of protected forests will disappear. In the pre-reproductive phase, trees with young plants will die immediately when exposed to fire. In addition, both plants have good wooden structures, so they are widely used as boards especially in the post-reproductive phase. This causes the number of individuals in the post-reproductive phase to be low.
- (2) **Natality**
- Resosoedormo. et.al (1992) the population has characteristics that are unique to groups that are not owned by each individual member. Population grows when natality exceeds mortality. Growth rates in the pre-reproductive phase of the plant population *Mangifera casturi* and *Fagraea crenulata* appear to be less. This is predicted because most of the plant's fruit is used by the community. Therefore, the seeds are not often found under mature trees and if the fruit is taken and taken out of the area. This also influences the birth rate of these plants because of the smaller number of pre-reproductive populations.
- Plants around the mother in the pre-reproductive phase do not have enough space to grow properly. So there is competition in finding nutrients and water for growth. "Semai" that get enough nutrients and water will continue to develop into a "sapihan", while seeds that do not get enough nutrients and water will lose and die. Plants around the mother in the pre-reproductive phase do not have enough space to grow properly. So there is competition in finding nutrients and water for growth. "Semai" that get enough nutrients and water will continue to develop into "a sapihan", while seeds that do not get enough nutrients and water will lose and die. In this reproductive phase, these two plants are predicted to proceed in a long time, so that the growth and development of the pre-reproductive phase are accumulated in this phase. While the mortality rate of these two plants in the reproductive phase is low. This causes the number of individuals in the reproductive phase to always increase in number.
- (3) **Abiotic factors**

- An abiotic factor has a significant role for the plants in the research location. It is like the temperature of the air abiotic factors: soil pH, soil moisture, air moisture, velocity of the wind, the intensity of light as well as organic land. Those abiotic factors are very influential and really important for the spread of herbs or distribution. These are in accordance with the opinions of Michael (1995) stated that abiotic factors can serve as restricting factors on the growth of and the distribution of plant. Based on the data environmental factors, there are some research environmental parameters to be restricting factors such as: the intensity of light ranges from 2518-20000 lux; wind speed ranges from 0.0-1.2 m/s; and moisture land ranges from 78-100 %. While the parameters are not be restricting factors for one and the other; the temperature ranges from 28 – 330 ^{0}C; moist air ranges from 78-80 %. ph land ranges from 5.2-6.8. N mineral 0.25 %. P mineral the area around 0.01 %.

- Population structure always changes according to time. One of the factors that led to the change was human activity (Surasana & Taufikurrahman, 1994). Based on the results of interviews, people usually only cut down the old and big plants. The results of the logging of the plants were taken for fuel and building materials, such as boards. Not all fruits of the plant in the forest area are harvested for consumption and sale. This enable the seeds of the fruit to grow into seedlings. The large number of seedlings indicates that the seeds that fall mostly grow into shoots. Mature fruits can also be taken and consumed by monkeys, squirrels, birds and bats. But these animals only eat the flesh, and the seeds are left to the ground, and then fall to the ground. People rarely take and use seeds. Seeds that fall to the ground have the opportunity to grow into shoots in conditions suitable for their growth. Thus there are many buds to be found.

- IUCN (2014) categorizes scarcity of a plant as seen from a number of individuals than the adults in 1 square kilometers. A critical state if in 1 square kilometers found less than 25 individual adults and when less than 5 individual adult called isthmus. Thus 13 plants of the the Maluka riverside area of not critical. because they were so many there are a lot of.

-

4. CONCLUSION

- The results of the research found 13 plants species crops tree with the differents structure population. Plant having structure shaped polygon population of about 4. namely; *Mangifera indica. Flacourtia rukam. Antidesma ghaesembilla.* and *Melaleuca cajuputi*. Plants structured population on the basis of wide is 6 plants. namely; *Gluta renghas. Acacia auriculiformis. Syzygium sp.. Syzygium guineense. Pisonia sp..* and *Cassia device*. Plant having the population structure a pitcher. namely; *Mangifera casturi* and *Fagraea crenulata*. Plants the structure of the population shaped a inverted of pyramid polygon is *Lagerstroemia speciosa*. Based on this research. the potential of the population in Maluka riverside can be developed to become teaching materials.

- **5. ACKNOWLEDGMENT**
-
- **6. REFERENCES**
-
- Odum, E. P. (1993). *Dasar-Dasar Ekologi Edisi Ketiga*. Yogyakarta: Gadjah Mada University Press.
- Subahar, T. (1998). *Struktur Dan Pola Penyebaran Dispersal (Distribusi Populasi).* ITB Bandung.
- Syahdi, Dharmono, Muchyar. (2016). *Prosiding Seminar Universitas Lambung Mangkurat 2016 "Potensi, Peluang, dan Tantangan Pengelolaan Lingkungan Lahan Basah Secara Berkelanjutan"* Struktur Populasi Tumbuhan Aren (*Arenga pinnata* Merr.) di Kawasan Wisata Air Terjun Rampah Manjangan Lokado. ISBN: 978-602-9092-91-2. Lambung Mangkurat University Press.
- Dharmono, Riefani M.K, Mahrudin. (2016). The Structure of The Population of Region of Kalang Village. *Article of The 1st International Conference on Innovation And Commercialization of Forest Product"*. Lambung Mangkurat University, Faculty of Forestry.
- IUCN. (2014). *The Red List of Betulaceae. Botanic Gardens Conservation International*, UK.
- Hardjosowarno, S. (1990). Dasar-Dasar Ekologi Tumbuhan. Fakultas Biologi UGM, Yogyakarta.
- Surasana, E.S., Taufikkurrahman. (1994). *Pengantar Ekologi Tumbuhan*. ITB, Bandung
- Michael. (1995). *Metode Ekologi untuk Penyelidikan Ladang dan Laboratorium*. Jakarta: UI Press
- Resosoedarmo, S. Kuswata K., Apriliani S. (1990). *Pengantar Ekologi*. Bandung, PT Remaja Rosdakarya.
-

IJWEM

An International Journal on Wetlands Environmental Management
Office: Research Institution of Lambung Mangkurat University, Jl.
Hasan Basry, Kayu Tangi, Banjarmasin, Indonesia. Web:
ijwem@ulm.ac.id.

Nomor   : 017/K/2018

Lampiran   : 1 (satu) berkas

Perihal   : Tagihan pendaftaran

Yth.

Kontributor JWEM

di- Tempat

Terima kasih atas keinginan bapak/ibu untuk menerbitkan naskah pada Journal of Wetlands Environmental Management (JWEM). Sesuai dengan aturan selingkung JWEM, contributor JWEM dikenakan biaya pendaftaran naskah sebesar satu juta rupiah. Untuk penyelesaian biaya dan pemrosesan naskah, bapak/ibu dengan ini diundang untuk hadir pada:

    Hari/Tanggal   : Senin, 31 Desember 2018

    Waktu   : Jam 10.00-Selesai

    Tempat   : Hotel Tree Park, Jl. A. Yani KM 6,5 Banjarmasin

Demikian undangan ini disampaikan, terima kasih sebelumnya atas perhatian dan kehadiran.

                           Banjarmasin, 26 Desember 2018

                           Executing Manager,

                           Dr. Eng. Irfan Prasetia

Tembusan:
1. Editor-in chieft
2. Arsip