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Research Article

Bamboo distribution in Musi Rawas district South Sumatera province

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ABSTRACT

Indonesia is estimated to have 157 species of bamboo which is more than 10% of the world's bamboo species. Almost 50% of bamboo growth in Indonesia is endemic bamboo and more than 50% of bamboo species life in Indonesia have been utilized by the society conventionally. Further, the bamboo utilization is still having high potential to be developed by increasing the industrial development. This research aimed to investigate the diversity of the bamboo species in South Sumatera, particularly in Musi Rawas district. The result showed that in Musi Rawas district of South Sumatera province there are 10 species of bamboo located at 11 locations in protected forest area of 883.60 ha and production forest area of 177,976.26 ha. The large number of bamboo potentials viewed from various aspects and the many types of bamboo scattered in this district can be a supporting data in doing bamboo conservation efforts, especially in Musi Rawas district of South Sumatra province.

Keyword: bamboo, distribution, MURA, maps

1. INTRODUCTION

Bamboo is one of non-timber forest products that grow in secondary forests, open forests, and even in primary forest. Bamboo also one of Indonesian economic plant that mainly growth in people garden and villages. This plant commonly utilized intensively by the society, both in the villages and in the city, for their daily necessary. However, it was not utilized optimally in order to increase the foreign exchange.

Indonesia estimated has 157 type of bamboo species and it is 10% of the world bamboo species. The type of bamboo in the world is estimated to consist of 1250-1350 species. Among the types of bamboo grown in Indonesia, 50% of them are endemic bamboo and more than 50% of them have been exploited by the society and are highly potential to be developed.

Bamboo has many functions in may field such as industry, agriculture, and food. For example, *Bambusa vulgaris var vulgaris* has been widely used for furniture, chostick, and pulp (Berlian and Rahayu, 1995). In dietary field, the bamboo shoots from some species i.e. *Bambusa blumeana, Bambusa vulgaris* var.*striata, Bambusa vilgaris,Dendrocalamus asper, Gigantochloa hassakarliana, Gigantochloa nigrociliata, Schizostachyum brachycladum, Schizostachyum lima, Schizostachyum silicatum, Schizostachyum zollingeri,* have been utilized as vegetables (Arinasa, 2004). In the health field, bamboo has widely utilized for medical purpose. In this case, the root of the bamboo

from the *Gigantochloa apus species* has been used for kidney stone disease, gastric pains, hypertension, liver, kidney disease. While it stem could be used to facilitate the labor process, treat wounds, and heatiness (Sujarwo *et al.*2010).

In the construction field, since ancient times, some types of bamboo species such as *Gigantochloa pseudoarundinacea* dan *Gigantochloa robusta* have been applied as construction material and building accessories (Sulastiningsih dan Santoso, 2012). Ecologically, the bamboo root will be able to maintain the hydrological system as water and soil binder so it can be used as a plant of conservation (Hartono, 2011).

According to the Forest Service of South Sumatra (2015), the potential for non-timber forest products in South Sumatra is speeded in various location i.e. 7.953 tons in natural reserves, 24.179 tons in national park, 6 tons in natural park, 16.454 tons in protected Forest, 8.597 tons in production forest, 40.159 tons in production forest, and 4.054 tons in conservation production forest.

Recently, the research concerning in bamboo distribution in South Sumatra has been done by some researchers. Wardana et al. (2008) has reviewed the distribution and potential of bamboo ecology in Bukit-Jambul Protected Forest Gunung Patah Pagaralam Province of South Sumatra Province. Nuraetin et al. (2014) has carried out an inventory and identification of bamboo species in the Pagar Alam Bamboo Forest Area of South Sumatra Province.

In this work, the large number of bamboo potentials and distribution in South Sumatera was studied by various aspects particularly bamboo species from Musi Rawas district. The result of this investigation is hoped could be fulfilled the lack of the bam-

boo distribution in South Sumatera. So it can be a supporting data in bamboo conservation efforts, especially in South Sumatra. Due to the lack of comprehensive data on the distribution of bamboo, in South Sumatra especially in Musi Rawas district (MURA), with forest area of MURA (HL: 883,60 Ha; HP: 177,976,26 Ha)

2. EXPERIMENTAL SECTION

2.1. Materials and Instrumentation

Some tools and instrument used in this study were stationery, GPS (Global Positioning System), Hygrometer Thermometer, Soil tester, digital camera, machete, newsprint, large plastic sack, plant scissors, cloth shears, transparent plastic bags (40 x 60 cm), Raffia rope, anti-thorn gloves, cardboard, cull box, hekter, ruler. The materials used in this work were bamboo samples and alcohol 70%.

2.2. Sampling Method

Sample collection was done by purposive sampling method. Bamboo sample was collected according to the literature study from forestry service in 2015. The data from forestry department informed that there are five districts with largest forest area in South Sumatera i.e. Ogan Komering Ilir (OKI) district (Forest: 96,505.57 Ha; Production Forest: 643,838.45 Ha), Musi Rawas district (Protected forest: 883,60 Ha; Production Forest: 177,976,26 Ha), Musi Banyuasin district (Protected forest: 16.300,99 Ha; Conservation forest: 56,039.12 Ha; Production Forest: 400,545.99 Ha), Ogan Komering Ulu Selatan (OKUS) district (protected fores: 127.966,39 Ha; production forest: 17,844.57 Ha), and Lahat district (protected forest: 48.312,30 Ha; HP: 28,546,74 Ha). In this research, the sample was collected mainly from the protected forest of Musi Rawas district.

2.3. Procedure

2.3.1.Observation

Observation is an early activity where researchers walk with the leader of local society or local people who know about bamboo and its growth location. The local society encountered when the observation conducted, as well as some peoples who knew about existence of the bamboo have been chosen as the respondents for the experimental data source.

2.3.2. Interview

The interview with the local society has been carried out with the chosen respondent in the observation step. The interview was conducted based on the question that constructed in structured way. Some aspect that included in the questionnaire are the local name of the bamboo, Indonesian name, the species name of the bamboo, the growth place, the benefit and utilization of the bamboo by local society. The result of the interview was concluded and summarized and re-read to the responder to check and ensure the truth. Here is some question that given to the responder during the interview.
1. What type of the bamboo that exist in their area?
2. What is the local name of bamboo that exist in their area?
3. What is the bamboo utilized for?
4. Is the bamboo existed in their area intentionally planted or has
5. been existed long time ago?
6. Are there any communities or local society that cultivate bamboo?

7. Is there a bamboo production site? If any where it was?

2.3.3. Samples Collection

Samples collection have been done by exploration method. The sample that collected was the bamboo shoots, stems, leaves, and reed. Each sample labeled with hanging label then spaying with the alcohol 70% and stored in closed plastic bag and the samples ready for the identification.

2.3.4. *The assessment of the environmental factor in the research location*

The assessment of environmental factors in research location was conducted by recording some environmental factors including air temperature, air humidity, soil moisture, soil pH and altitude.

2.3.5. *Samples identification*

The obtained bamboo samples then identified based on the taxonomy books such as K.M Wong (1995), Dransfield & Widjaja (1995), Widjaja (2001) and bamboo journals. Each sample is documented in the form of a photograph.

2.3.6. *Sample description*

The result of the sample analysis and identification toward the characteristics and properties then converted into a complete description of each bamboo type. Each part of the bamboo sample collected were described including bamboo shoots, roots, stems, and leaves, General properties to special properties such as the stature of bamboo shoots, roots, stems, and leaves.

2.3.7. *Data analysis*

The bamboo data obtained through the exploration is grouped, then the data of distribution and morphology are analyzed presented descriptively and tabulated with description of each type and photograph.

3. RESULTS AND DISCUSSION

Distribution of bamboo plants in the district of Musi Rawas, Sukaraya village, Suku Tengah Rakitan Ulu district, was grown over protected forest area cogong hill. The following figure is a map of exploration results of bamboo plant distribution in Musi Rawas district.

Figure 1 shows bamboo spots on the map of the cogong hill

Figure 1. The maps of bamboo location in Cogong hill Musi Rawas district

Table 1. Bamboo plants and environmental factor results in musi rawas district

Bamboo name	Latitude	Environmental factor			
		Air temperature	Humidity		pH
			Air	Soil	
Gigantochloa pseudoarundinace (Steud) Widjaja	-3.155	26.0	91%	30	6
Dabuk bamboo	102.903	26.5			
Bambusa glancescens (willd) Sieb	-3.156	26.0	91%	30	6
	102.904	26.5			
Bambusa vulgaris Schard. ex J.C. Wenld	-3.156	26.0	91%	30	6
Ampel bamboo	102.905	26.5			
Bambusa multiplex (Lour) Raense	-3.154	26.0	91%	30	6
Seruas bamboo	102.905	26.5			
Bambusa vulgaris var *vulgaris* Schrad. ex Wendl	-3.150	26.0	91%	30	6
	102.904	26.5			
Aur Polos bamboo					
Bambusa blumeana J.A. & J.H. Schultes	-3.150	26.0	91%	30	6
	102.904	26.5			
Aur Berduri bamboo					
Bambusa vulgaris var *striata* Schrader ex Wendland	-3.151	26.0	91%	30	6
Kijang Besar bamboo	102.899	26.5			
Bambusa vulgaris var *striata* Schard. ex Wendl.	-3.150	30.2 31.6	65%	50	5,1
Kijang Kecil bamboo	102.903				
Gigantochloa robusta Kurs	-3.156	30.2 31.6	65%	30	6
Mayan bamboo	102.903				
Gigantochloa atroviolacea Widjaja	-3.155	30.7	84%	40	5,5
Black bamboo	102.906	30.7			
Bambusa vulgaris var *striata*	-3.155	31.5	76%	40	6
Yellow bamboo	102.906	32.2			
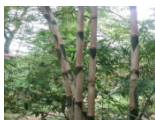
forest area, where each type of bamboo is represented by a single map location icon. The description of each bamboo distribution is presented in table 2. The complete result of the bamboo species identification in Cogong hill Musi Rawas district tabulated in table 1.

The result that summarized in the table 1 clearly described that the distribution of the bamboo in Musi Rawas district, particularly in Sukaraya village, Suku Tengah Rakitan Ulu subdistrict was dominated by ten bamboo species i.e. Dapuk bamboo (*Bamboo glauc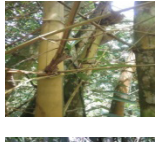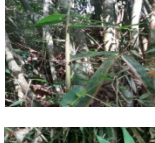escens* (Steud), Ampel bamboo (*Bambusa vulgaris* (Steud) Widjaja), Seruas bamboo (*Bambusa multiplex* (Lour) Raeusch), Aur Polos bamboo (*Bambusa vulgaris* var *vulgaris* Schrad. ex Wendl), Aur Thorns bamboo (Bambusa *blumeana* J.A. & J.H. Schultes), Kijang bamboo (*Bambusa vulgaris* var *striata* Schrader ex Wendland) Mayan bamboo (*Gigantochloa robusta Kurs)*, black bamboo (*Gigantochloa atroviolacea*), and Yellow bamboo (*Schizostachyum brachyladum* (Kurz) Kurz).

4. CONCLUSION

Distribution of bamboo in the district of Musi Rawas, sukaraya villages, Suku Tengah Rakitan Ulu subdistrict, was dominated by ten species of bamboo namely; bamboo dapuk (*Bamboo glaucescens* (Steud) Widjaja), bamboo Ampel (*Bambusa vulgaris* (Steud) Widjaja), bamboo Seruas (*Bambusa multiplex* (Lour) Raeusch), bamboo Aur Polos (*Bambusa vulgaris* var *vulgaris* Schrad. ex Wendl), bamboo Aur Thorns (Bambusa *blumeana* J.A. & J.H. Schultes), bamboo Kijang (*Bambusa vulgaris* var *striata* Schrader ex Wendland) bamboo Mayan (*Gigantochloa robusta Kurs)*, black bamboo (*Gigantochloa atroviolacea*), and Yellow bamboo (*Schizostachyum brachyladum* (Kurz) Kurz)). The result was presented in the form of digital map-based (spatial data) technology information displayed in a dynamic geographic information system application so that bamboo location data, photos and other relevant information can be easily understood and utilized. Geographic information system application

Table 2. Bamboo picture and its icon representative on the map of bamboo distribution

No	Bamboo name	Icon	Picture
1	Ampel bamboo *Bambusa vulgaris* Schrad. Ex J. C. Wendl		
2	Aur Berduri bamboo *Bambusa blumeana* J.A. & J.H. Schultes		
3	Aur Polos bamboo *Bambusa vulgaris* var *vulgaris* Schrad. ex Wendl		
4	Dabuk bamboo *Gigantochloa pseudoarundinaceae* (Steud) Widjaja		
5	Hias / Jepang bamboo *Bambusa glaucescens* (Willd) Sieb		
6	Black bamboo *Gigantochloa atroviolaceae* Widjaja		
7	Kijang bamboo *Bambusa vulgaris* var *striata* Schrader ex Wendland		
8	Yello bamboo *Schizostachyum brachyladum* (Kurz) Kurz		
9	Mayan bamboo *Gigantochloa robusta* Kurz		
10	Seruas bamboo *Bambusa multiplex* (Lour) Raeusch		

that became the end result of this research was developed with dynamic web-based codegIqnitier programming language with homepage administrator to process input, update and delete data.

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