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Submission date: 17-May-2025 12:41AM (UTC+0700)

Submission ID: 2615038375

File name: Proceeding,_1st_ICST_Mataram_University_2016.docx (21.77K)

Word count: 3090

Character count: 15992

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Characteristics Of Water Inundation In The Swampland Of Pelabuhan

Dalam Village (Ogan Ilir South Sumatera)

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Abstract

Fluctuations in water level is very closely related to the rain and tidal rivers. Water level fluctuations can change from year to year, so it will change the characteristics of water fluctuation pattern. During the rainy season, water from tidal river resulting inundation occurred in paddy fields. Thus, High and period of inundation water on the swampland is affected by rainfall and tides from the river. In determining the pattern and the planting period must adjust the characteristics of an inundation in the swampland. Therefore, this study purpose is to determine the characteristics of the inundation, a pattern and depth of inundation. The methods were used observation and experiment, and inventory data. Direct observation to the field that was in the rice fields on Village of Pelabuhan Dalam. Microcontroller sensors were used to measure water fluctuations in research location area, analysis was done by using GIS and ETo analysis also graphic tabulation. This study was conducted in the District of Keramasan Pemulutan, Pelabuhan Dalam Village, Ogan Ilir South Sumatera from march to September 2016. Finally, The conclusions that can be drawn were 1)Inundation characteristics in Pelabuhan Dalam was influenced by river tidal from Ogan river, The depth of an inundation of water was influenced topography factor, also by the distance between the land and the water channel of the river, 2)water fluctuation during the morning was tend to be higher than during the afternoon, 3)There are some characteristics of water inundation : ZONE I: Zone which has water depth of-50 cm (50 cm below groundwater level) to 0 cm, ZONE II: Zone which has water depth of 0 cm to 50 cm on the ground, ZONE III: Zone which has water depth of 50 cm to 100 cm on the ground.

Keywords: inundation, water level fluctuations, swampland, river tidal, rainfall

1 Introduction

The Fluctuations in water level is very closely related to the rain and tidal rivers (Puspitahati et al, 2013). Erratic rainfall can change the water level fluctuations from year to year, so it will change the characteristics of an inundation. During the rainy season, occurred inundation in paddy fields. Height and long term of inundations on field are affected by rainfall and water level of the river.

In addition to rainfall, water level fluctuations are affected by sea levels rising and tidal rivers. It will affect hidrotopografi and the ability of land drainage (Rahmadi et al, 2010). Fluctuations and periods of high water levels in the soil will affect the type of inundation. Inundation of swampland can be caused by tides, rain puddles or rivers overflow (Noor, 2007). Swampland, especially in Pelabuhan Dalam village has a characteristic that is

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influenced by the tide of the river. It is caused by fluctuation of the tidal rivers and rainfall, then the water level in the fields can not be predicted certainty. Therefore, the pattern of swampland management in Ogan Keramasan undeveloped optimally, such as the cropping pattern is still in the form of rice-fallow, the condition of the water level as a constraint, so that farmers are able to grow rice once per year periodically (Saleh et al., 2013). These problems can reduce productivity and cause failure of crops in swampland.

Finally, Successful management of agriculture in swampland is determined by water management (Susanto, 2010) and the water control to optimize land (Ogban, P. I. et al, 2010). Water management of swampland can be done through the adaptation and water management engineering. However, it is not sufficient just by adaptation (Sang Ok, 2012), it is important to determine the characteristics of inundation water in order to predict and to design cropping pattern more than two periodicly in a year. High and period of inundation water on the swampland is affected by rainfall and tides from the river, so this study purpose is to determine the characteristics of the inundation, a pattern and depth of inundation.

2. Materials and Methods

This study was conducted in the District of Pemulutan, Pelabuhan Dalam Village,

Ogan Ilir, South Sumatra. It was from March to September 2016. The methods of the research were surveys, installation of measuring devices, observations of water levels and rainfall, the analysis of the characteristics of an inundation. To find out the fluctuations in water level and precipitation for 3 months was observed in the fields. Rainfall was measured every day when it was rain. It was plugged pascal boards along 2 m in to the location area to measure the water level. This research also used sensors device (Microcontroller sensors) and pziometer to observe fluctuation the water.

The analyzes of water level fluctuation were done by hydrograph water level fluctuations and chart comparison of the relationship between the rainfall and water level. After that, carried the analysis characteristics of inundation in swampland and did classify the type and characteristics of inundation by looking at the pattern and depth of inundation. Analysis inundation water was according to criteria of swampland based on hidrotopografi which classified in three types.

3. Results and Discussion

The highest rainfall in June 2016 with the thickness of the water was 30 ml on the 26th, the highest rainfall in July 2016 with the thickness of the water was 20 ml on 23th, while the highest rainfall in July 2016 was the thickness 30 ml of water were on 22th and 20th.

Characteristics of water inundation is the behavior of water particularly in swamp land from time to time or from season to season can cause by the early of flooding, stagnant water and the end of the flooding. It can be seen from the length and the depth of water level. Water level fluctuations can change from year to year, so it will change the characteristics of water fluctuation .

The results of measurements of water level in fields. Measurements were made every day using pascal board and sensors from May to July 2016.

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Figure1. Results of water level (N1,N2,N3,N4) in Mei, June and July 2016

In determining land zones, the estimation based on the average height of stagnant water which was time has longer than others. It was measured with four points zones there were zone N1, N2, N3 and N4. the result of classifications were based on water level height, there are some characteristics:

- 1) ZONE I: Zone which has water depth of -50 cm (50 cm below groundwater level) to 0 cm.
- 2) ZONE II: Zone which has water depth of 0 cm to 50 cm on the ground
- 3) ZONE III: Zone which has water depth of 50 cm to 100 cm on the ground

On land N1 and N2 can be categorized of zone I because it was included a bit drier than on land N3 and N4. It was influenced by topography factor. It is because the land N3 and N4 are more inclined to decline and was lower than in land N1 and N2. In addition, the depth of water inundation is influenced also by the distance between the land and the water channel of the river. In the land N3 and N4 were closest to the drains that drain water from the river water.

So that when it was tide, water flowed directly into the channel and into the zone N3 and N4, then entered the zone N1 and N2. And when it subsided, the land N1 and N2 were dry earlier than land N3 and N4.

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4. Conclusions

Finally, The conclusions that can be drawn were :

1. Inundation characteristics in Pelabuhan Dalam was influenced by river tidal from Ogan river, The depth of an inundation of water was influenced topography factor, also by the distance between the land and the water channel of the river.

2. water fluctuation during the morning was tend to be higher than during the afternoon.

3. There are some characteristics of water inundation :

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56 Proceeding, 1st ICST Mataram University 2016 Characteristics Of Water Inundation In The Swampland Of Pelabuhan Dalam Village (Ogan Ilir South Sumatera) Puspitahati 1*, Edward Saleh 2, Robiyanto H. Susanto 2, Ngudiantoro 2 1 Student Doctoral Program of Agricultural Sciences Faculty of Agriculture, Sriwijaya University, South Sumatera 2 Supervisor of Doctoral Program *Email: pusphyt4@yahoo.com Abstract Fluctuations in water level is very closely related to the rain and tidal rivers. Water level fluctuations can change from year to year, so it will change the characteristics of water fluctuation pattern. During the rainy season, water from tidal river resulting inundation occurred in paddy fields. Thus, High and period of inundation water on the swampland is affected by rainfall and tides from the river. In determining the pattern and the planting period must adjust the characteristics of an inundation in the swampland. Therefore, this study purpose is to determine the characteristics of the inundation, a pattern and depth of inundation. The methods were used observation and experiment, and inventory data. Direct observation to the field that was in the rice fields on Village of Pelabuhan Dalam. Microcontroller sensors were used to measure water fluctuations

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