RESEARCH ARTICLE OPEN ACCESS

INVENTORY CONDITIONS OF SWAMP IRRIGATION RANTAU RASAUOFTANJUNG JABUNG TIMURREGENC

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ABSTRACT
The agricultural sector is the main source of food supply for 245 million Indonesians, it's supply about 87% raw materials for small and medium industries, and contributes 15% of GDP with foreign exchange value of around 43 billion USD. In the future agricultural sector remains one of the mainstays for national food and energy security.the achievement of these food security targets is overshadowed by biophysical threats and constraints. In addition to productive land conversion and climate change, other serious threats faced are the degradation of land, water and environment resources and the widespread of degraded and abandoned land.This research method is done by conducting direct survey in the field by doing observation, measurement and documentation on the condition of irrigation area of rawa rasawa rawa.The results of this study are, the lack of funds for the swamp irrigation areas maintanance has became one of the causes of the community from planting rice plants to other crops and increasingly unfavorable to planting rice plants compared with other plants.

Keyords :Inventory, RantauRasau,Swamp IrigationandChanging cropping pattern.

Date of Submission: 05-03-2018 Date of acceptance: 20-03-2018

I. PRELIMINARY

The agricultural sector is the main source of food supply for 245 million Indonesians, it's supply about 87% raw materials for small and medium industries, and contributes 15% of GDP with foreign exchange value of around 43 billion USD. In the future agricultural sector remains one of the mainstays for national food and energy security.

As a large country, food security is the main pillar of national stability, so it becomes a necessity of agricultural development is the main target that can not be bargained. Until now, rice is the main component of national food security, so rice self-sufficiency remains the main indicator of food security. Therefore the government is determined to continue to increase national rice production.

But the achievement of food security targets is overshadowed by some threats and biophysical constraints that must be anticipated and overcome. In addition to productive land conversion and climate change as a global warming derivation, other serious threats faced are the degradation of natural resources, water and environment (erosion, landslide, pollution) and widespread degradation displacement of land. Therefore, a strategy that is supported by an integrated policy among related sectors, especially the optimization of land resources.

Wetland area which currently covers about 8.1 million hectares tends to experience shrinkage due to conversion, even in the last ten years there has been the conversion of paddy fields into oil palm plantations. Approximately 3.1 million hectares of paddy fields are also overshadowed by the threat of functional alteration, in relation to the spatial plan of the district (RTRW) of Kota throughout Indonesia. In terms of budget constraints as well as various socio-economic factors and aspects of land ownership and other constraints in the field, the government's ability in paddy field printing is only about 30-40 thousand hectares per year.

In addition, fertile and intensive rice fields on the island of Java, both intentional and unintentional, have great pressure due to the transfer of functions for other uses, especially for infrastructure and industrial development. On the contrary, the development of agricultural land outside of Java, especially in the corridor of Kalimantan, Sulawesi, Sumatra and Papua is faced with technical constraints because most of the available land in the corridor is a suboptimal land. Moreover, by 2050, an additional 14.9 million hectares of land will be needed, consisting of 5 million hectares of paddy fields, 8.7 million hectares of dry land and 1.2 million hectares of swampland. On the other hand, besides primary forest, the available land is suboptimal land including degraded or abandoned land. Therefore, the main option that must be taken to meet the needs of food and other commodities is the development and optimization of suboptimal and degraded land, both through intensive and extensification approaches.

Suboptimal land that is the main reserve for the future naturally has low productivity with various constraints due to inherent factors (soil, parent material) and external factors due to extreme climates, including degraded land due to unwise exploitation.

In addition to aspects of the aspects mentioned above, is also determined by the coordination system, cooperation and synergy between ministry programs and related institutions such as Forestry, PUPR, Transmigration and Domestic Affairs and Government and Private / State Owned / BUMN.

II. THEORETICAL BASIS

Hydrotopography is the relationship between ground level and water level elevation so that this hydrotopography is the basis for water management and planning in tidal areas (Suryadi, 1996)

The hydrotopography in the tidal swamp area can be grouped into four categories as follows:

1. **Category A**
   The land is inundated > 4 -5 times per full pairs cycle, both in the rainy season and dry season.
1. **Category B**
   The land inundated > 4 - 5 times per full-time cycle, in most rainy seasons.
3. **Category C**
   The land inundated <4 - 5 times per cycle of full tide, there are effects of tidal on ground water.
2. **Category D**
   The land has never been inundated by large tides. No tidal effect on groundwater.

For more details can be seen in Figure 1. Below

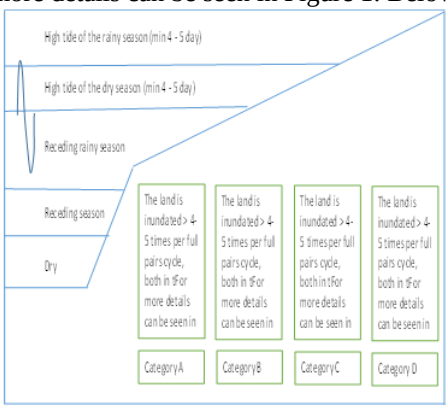

Figure 1. Classification of swamp hydrotopgraphy

However, if the review of the water system is compared to the hydrotopography of the tidal swamp area, the flood water in the tidal swamp area can be divided into four types (Ananto, et al, 1998) ie the overflow type A, B, C and D. This overflow classification occurs at during spring tide and neap tide for more details can be seen in Table 2.below

Type of inundation	Information
Type A	The land is always inundated by the tide of spring tide and neap tide
Type B	The land is flooded only by the tide of spring tide but not inundated neap tide or daily tides
Type C	The land is not inundated by the large tides but groundwater is at a depth less than 50 cm from the soil surface
Type D	The land is not inundated by the large tides but groundwater is at a depth of mare than 50 cm from the soil surface

Source :Anantoet *al* (1998)

Table 2. Clasification of Land Inundated

Tidal are natural events that occur as a result of the pulling force between celestial bodies, the attraction of the sun and the moon to the earth being the cause of the lifting of the seawater (Department of Public Works, 1995). Tidal conditions can be explained as follows:

1. Spring Tide is the highest tidal condition, this is because the moon is between the earth and the sun in a straight line so that the pull force reinforce each other.
2. Neap Tide is a condition of the moon's earth connecting line perpendicular to the earth of the sun so that the highest ebb and lowest tide occurs.
3. Semi Diurnal Tide is a condition of the earth liaison line of the moon to form an angle of 90^0 against the axis of rotary earth so that the surface of the earth facing the moon occurred double pairs daily.
4. Diurnal Tide is a condition of the moon's lunar line is not perpendicular to the axis of the earth so that the earth's surface facing the moon occurs single daily pairs.

Drainability is a possibility that the groundwater level can be lowered at a certain elevation during the planting period. Drainability can be classified into three categories:

1. Shallow drainability (<30 cm) if groundwater can be lowered <30 cm below surface. This condition is an obstacle to the development of crops or perennials because it requires aeration in its root zone while in rice plants may interfere with its growth.
2. Medium Drainability (30-60 cm): if ground water can be lowered 30-60 cm below the surface. This condition is quite suitable for rice plants and polowijo, while for hard plant need to be done above the mound.
3. Drainability deep (> 60cm) in general drainage is not an obstacle for various types of plants.

The effect of salin intrusion on tidal land can be classified into two categories:

1 Saline,salt water intrusion (DHL> 5 mS / cm) in the main channel lasts for more than 1 month

2 No saline, salt water intrusion (DHL≤ 5 mS / cm) discharged lasting less than or equal than one month.

Unity of land in tidal areas can be divided into 10 categories with details can be seen in Table 1 below

Table 1. Land Unit in tidal areas

No	Units of Land	Description of land characteristics
1	SL-I	Tidal irrigation soils (hydrotopography A and B) , No Saline
2	SL-II	mineralized soil pyrite, muck, saline, drainability < 60 cm
3	SL-III	mineralized soil pyrite, muck, saline, drainability > 60 cm
4	SL-IV	Mineralized soil, muck, no saline, drainability < 60 cm, hydrotopography C/D
5	SL-V	Mineralized soil, muck, no saline, drainability > 60 cm, hydrotopography C/D
6	SL-VI	Peat soil, peat thickness > 50cm, ash content< 25 %
7	SL-VII	Land of ry transition, very low fertility, KTK < 5 me/100g.
8	SL-VIII	Mineralized soil, no pyrite, no saline, drainabiity < 60 cm, hydrotopography C/D
9	SL-IX	Mineralized soil, no pyrite, no saline, drainabiity > 60 cm, hydrotopography C/D
10	SL-X	Mineralized sil,no pyrite, saline

Based on land use type and land unit characteristic, the distribution of tidal water zone of tidal area can be divided into eight categories for clarity can be seen in Table 2. The following

Tabel 2. WMZ in Tidal Areas.

No	WMZ	Land Unit	Description ZPA
1	WMZ I	VI	Peat soil, Planted with hard plants
2	WMZ II	II	Transisi soil, lo fertility, Planted with hard plants
3	WMZ III	I	land of tidal irrigation, planted with rice paddy
4	WMZ IV	IV, V	soil of pyrite, muck, planted rice paddy irrigation pump
5	WMZ V	VIII, IX	soil of no pyrite, muck, planted rice paddy irrigation pump
6	WMZ VI	III, V, IX	Soil of pyrite/muck, drainability > 60 cm, Planted ith hardplants
7	WMZ VII	VII, IX, X	Soil of no pyrite, Planted with rain fed rice
8	WMZ VIII	II, III, IV, V	Soil of pyrite, planted with rain fed rice

III. METHOD

The research method used to inventory the condition of swamp rantaurasau irrigation area in TanjungJabungTimur Regency is done by conducting direct survey in the field. Data were collected by observation, measurement and documentation on the condition of swamp rantaurasau irrigation area.

Field interviews were conducted in an unstructured way to the communities around the irrigation area of swamp rantaurasau to be able to freely explore the public's understanding of the utilization of swamp irrigation areas.

The results of interviews recorded and recorded and then processed in a qualitative way then analyzed to obtain a comprehensive picture of the condition of the area of irrigation area swamp rasaurasau.

IV. RESULT AND DISCUSSION

The results of hydrotopography analysis of swamp rataurasau if grouped in hydrotopography can be categorized as follows:

- Category B with the understanding of the inundated lands> 4-5 times the full-peak cycle in most of the rainy season with an area of 1698.73 hectares
- Category C with the understanding of land inundated <4-5 times the full-moon cycle, there are tidal effects on groundwater with an area of 8717.70 hectares.
- Category D with the understanding of land is never inundated by large tides, there is no effect of tidal on groundwater with an area of 1072 hectares.

Analyze drainability of swamp area. Rantau Rasau, is done by comparing the elevation of the land with the tidal surface elevation of the plan. The analysis shows that the elevation of land in DR.Rantau Rasau area has drainability> 60 cm.

From the sampling of land conducted on rantaurasau area can be concluded that the soil condition as follows:

- Swamp clay of no pyrite 8717.59 hectares.
- Swamp clay of pyrite 1698.73 hectares
- Peat Soil 1072.11 hectares.

The Unit of land for the swamp RantauRasau tidal area can be divided into two namely

- Land Unit IX with a total area of 8717.59 hectares
- Land unit V with a total area of 5.579,43 hectares

Evaluation of land suitability on land units, mainly based on physical aspects, whereas soil fertility is not all taken into account.

- Land unit V : This land unit of peat soils has a drainability of more than 60 cm. for this land can be planted in the rainy season alone because in general the height of this land is somewhat higher than the unit of land 4, the difficulty to hold water much larger. This land is also suitable for planting polowijo in the rainy season.

- Land unit IX :This lanis non-toxic, non-saline soil, has a drainage depth of> 60cm. This area can not be irrigated by tidal or only during rainy season only.

Water management zone is the zone of application of a water management system so that there is no conflict of interests of water management within the zone. The results of the development of rawarasau swamp area are included in the golngan water management type VI unit of 8407.66 hectares and the water management zone VIII of 5889.36 hectares.

The pattern of planting in the irrigation area of swamp rataurasau based on field search results are as follows:

- Rice fields of 1.506, 91 hectares
- Fields of 41.46 hectares
- Coconut deep of 729.15 hectares
- Palm oil of 8.912,76 hectares
- Rubber of 2.296,1 hectares
- Bushes of 366 hectares
- Another is equal to 444,64 hectares

The results of the length measurement of the channel conducted in the field obtained the primary channel length as follows:

- Primery channel 1 along 5.944,21 meter
- Primery channel 2 along 2.590,62 meter
- Primery channel 3 a long 12.357,43 meter
- Primery channel 4 a long 13.190,46 meter
- Primery channel 5 a long 12.706,18 meter
- Primery channel 6 a long 5.375,61 meter
- Primery channel 7 a long 10.617,68 meter
- Primery channel 8 a long 11.539,41 meter

While the measurement of the length of secondary channels conducted in the field obtained the length as follows:

- Paritchannel 11 a long 2.198,72 meter
- Paritchannel 14 a long 2.516,60 meter
- Secondary Channel 10 a long9.035,62 meter
- Secondary Channel 11 a long 6.346,39 meter
- Secondary Channel 12 along 8.706,97 meter
- Secondary Channel 13 a long 5.452,12 meter
- Secondary Channel 14 a long 6.307,66 meter
- Secondary Channel 15 a long 6.111,1 meter
- Secondary Channel 16 a long 662,30 meter
- Secondary Channel 17a long 9.035,62 meter

The survey results of the condition of buildings in the irrigation area of swamp rasaurawa are as follows:

- The buildings of the sliding door of 135 units
- The Buildings skotbalk doors as much 3
- The Culvert as much 33 units
- The Dock as much 3 units
- The bridge as much 105 units

The Condition of building and the cannal in most circumstances is damaged

The discussion is done based on the data obtained in the field and result the analysis conducted is as follows:

- Swamp land can be utilized because of the good drainage system, good drainage system then the process of land washing and the process of entry of fresh water to support the growth of plants can be arranged in accordance with the needs of plant growth. Damaged building conditions can be an obstacle for farmers to grow rice.
- If viewed from the economic side based on the results of interviews of the population then it appears a presumption

from the farming community that if income planting rice for a year only 2 times whereas if planting oil palm farmers can harvest 15 days

V. CONCLUSIONS

Some conclusions that can be drawn from the results of this study are as follows:

- The existing channel and wake condition in the irrigation area of rawarantaurasau, which is lack of maintenance due to the limited funding provided by the government is one of the reasons for the shifting of the community that originally planted rice to switch palm oil, coconut and rubber crops
- The movement of the community from other rice planting cultivation because rice crops less provide prosperity for the community the exploitation and maintenance of tidal swamp reclamation network, Jakarta.

ACKNOLEDGMENTS

This research can be completed because it is assisted by many parties so that to the parties who have helped many thanks, especially thanks to this is conveyed to the Water Resources Operations Unit of Sumatra River Basin VI which has given permission to survey and facilitate the data needed in the field. Acknowledgments are also submitted to the Director of CV. Tirta Adinugroho Malang who assisted funding in conducting this research.

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Hendra Wahyudi "INVENTORY CONDITIONS OF SWAMP IRRIGATION RANTAU RASAUOFTANJUNG JABUNG TIMURREGENC "International Journal of Engineering Research and Applications (IJERA) , vol. 8, no. 03, 2018, pp. 28-32