

Potential Study of The Utilization of Rawa Rantau Panjang Irrigation for Farmers of Lawang Wetan District Musi Banyuasin Regency

by Sriati Sriati

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Potential Study of The Utilization of Rawa Rantau Panjang Irrigation for Farmers of Lawang Wetan District Musi Banyuasin Regency

M Aminullah^{1,*}, Sriati¹, E Wildayana¹ and M Antoni¹

¹Faculty of Agriculture, Sriwijaya University, Palembang, Indonesia - 30128

*Corresponding Author: muhammadaminullah1@gmail.com

Abstract: This study is where from September 2020 to December 2020. The approach of irrigation areas is based on hydrological areas ranging from the main primary channel of the river, secondary channels to tertiary channels in the farmers' rice fields. At the same time, the approach of potential utilization of irrigation water Rantau Panjang used the pra method (participatory rural appraisal). In addition to knowing public perception and field facts, conducting Focus Group Discussion (FGD) with questionnaire tools. Furthermore, the data is processed, tabulated, and analyzed with SWOT analysis. This study aims to determine the potential of long-term swamp irrigation utilization for farmers of Lawang Wetan Subdistrict, Musi Banyuasin Regency. The result of the study on the potential benefits of irrigation of Rantau Panjang swamp is 1. The potential of local resources strength to restore the activities of gotong royong in all activities. 2. potentially increase the functional area from 300 ha to 1.000 ha. 3. The potential of the formation, strengthening, and empowerment of water-use farmers associations (P3A). 4. soil fertility rates at the study site based on the availability of nutrients are generally classified as low to moderate so that rice paddy plants are more suitable to be cultivated at this location.

keywords: irrigation, SWOT analysis, water-use

1. Introduction

The target of agricultural development for the realization of food sovereignty and the welfare of farmers is to increase rice production to establish sustainable self-sufficiency [1]. In addition, according to Hikam, the condition of food fulfillment in a country is reflected in the availability of food that is good enough in quality and quantity [4]. One of the efforts to improve and improve food security and achieve food sovereignty in South Sumatra is to manage optimal water resources on swampland to be utilized in rice crop businesses [2 - 4].

Swampland has excellent potential for agricultural business development in Musi Banyuasin Regency. The agricultural commodity on swamp type hydrotopography land that is very suitable for development is rice commodity (*Oryza sativa*.l.). Rice plants are one of the primary commodities in the swamp farming



community system. In addition, rice production potential by using superior seeds can reach 5.0-7.0 tons of dry grain harvest per ha [5].

Musi Banyuasin regency has swamp farmland that can be developed to support government programs on improving the welfare of farmers. Musi Banyuasin swampland is a swamp on the edge of the river with a flat topography, which is often inundated in the rainy season and dry in the dry season. The swampland in Musi Banyuasin regency is quite wide, about 63,011 ha [1, 3, 4].

One of the swamp irrigations in Musi Banyuasin Regency is in Lawang Wetan District, namely the Rantau Panjang Irrigation Area, covering an area of 1,922 ha. Rantau Panjang Swamp Irrigation Area, based on the Decree of the Minister of Public Works No. 14 of 2015 is the authority of the South Sumatra Provincial Government. Rantau Panjang Irrigation is located in the District of Lawang Wetan, which can irrigate three villages, namely Rantau Panjang Village, Karang Anyar Village, and Sukarami Village [3, 4].

Common problems faced in swamp irrigation areas include. Rantau Panjang Lawang Wetan Subdistrict Musi Banyuasin is on physical buildings and irrigation channels. Physical buildings and irrigation channels are often damaged, among others, in the main dam of damaged irrigation, malfunctioning floodgates, the occurrence of shallow, many irrigations channel walls that break, the closure of channels by wild plants and so on [7, 8].

Other problems are also in the institutional aspects of farmers. Based on the discussion results, the association of water user farmers (P3A) in Rantau Panjang has not been formed. While the farmer group (Poktan), there are already 8 (eight) farmer groups but less active [9 – 12]. The newly formed farmer women's group (KWT) is active in conducting activities and group meetings. Another institutional problem is the lack of attention from the relevant agencies to conduct coaching and counseling. The establishment of P3A and the lack of active farmer groups to reduce the agricultural activities of swamp irrigation lebak tend to be more individual farmers.

The existence of physical irrigation buildings that do not support passive group activities and lack of attention from related agencies greatly affects the production, productivity, and sustainability of swamp farming. Especially in the irrigation of swamps Rantau Panjang Lawang Wetan Subdistrict Musi Banyuasin [13 – 15].

This study aims to determine the potential of long-term swamp irrigation utilization for farmers of Lawang Wetan Subdistrict, Musi Banyuasin Regency. The output of this study can be an input for policy makers, especially regarding the potential use of long-term swamp irrigation for farmers in Musi Banyuasin Regency.

2. Materials and Methods

This study was conducted from September 2020 to December 2020. The approach of irrigation areas based on hydrological areas ranging from the main primary channel of the river, secondary channels to tertiary channels in farmers' rice fields. The farmer population is the community around the irrigation area that utilizes Rantau Panjang irrigation, including Rantau Panjang Village, Karang Anyar Village and Sukarame Village, Lawang Wetan Subdistrict Musi Banyuasin Regency [1, 2, 3].

The initial mechanism of the study of potential irrigation utilization of Rawa Rantau Panjang began from the determination of problems, namely about the usefulness of irrigation which is studied based on physical aspects, social aspects, economic aspects, and institutional aspects. Furthermore, the study was conducted by conducting literature studies and regulations related to irrigation.

Regionally, farmers example is taken based on the location of the service area to the main building or weir, divided into three: the upstream, the middle, and the downstream. The potential approach of irrigation water utilization rantau Panjang used the participatory approach pra method (participatory rural appraisal). In addition to knowing public perception and field facts by conducting Focus Group Discussion (FGD) with questionnaire tools. Field observes also by conducting irrigation network searches with farmers ranging

from the main dam, secondary channel to the end of the tertiary plot. The parties asked for input through interviews come from the village government, farmers, and local community leaders. Furthermore, the data is processed, tabulated, and analyzed with SWOT analysis.

3. Results And Discussion

3.1 General Conditions of Study Sites

Rawa Rantau Panjang Irrigation Area is located in the District of Lawang Wetan, Musi Banyuasin Regency. Rantau Panjang can irrigate in 3 villages namely Rantau Panjang Village, Karang Anyar Village and Sukarami Village. The Rantau Panjang Swamp Irrigation Area, Musi Banyuasin Regency, which has an area of Baku according to the PU Regulation of 1922 Ha.

Based on the results of studies and field information, it turns out that the irrigation area in Rantau Panjang has existed since the food self-sufficiency program in the Suharto era. However, before that, there was a small river that carried water from the Musi River to the area under the cover of the farmers. The water flow from the Musi river that passes through this natural channel can irrigate three villages, namely Rantau Panjang Village, Karang Anyar Village, and Sukarami Village.

The flow conditions can run according to the water conditions in the Musi River. That is, if the water in the Musi River is high and passes through the high estuary in the channel, the water can enter by itself, while when the water conditions in the Musi River are below the mouth of the flow, the flow cannot. This function depends on the high and low level of the Musi River. Suppose the condition of the Musi River recedes. In that case, the water in the rice fields will disappear, and the farmers will experience drought because water can be wasted through channels. With this condition, farmers can only plant rice once a year and can plant in April each year. So far, the channel has not been properly functioning to regulate the water pattern in the rice fields. The water condition is still not regulated. It is still said to be natural.

The source of water for rice fields in Rantau Panjang village comes from rainwater and the Musi River. Based on the results of research on the potential water availability of Rantau Panjang, it still exceeds the need for irrigation water, but there is a decrease due to damage to the weir, floodgates, main canal walls, dividing walls and blockages, and the number of wild plants in the irrigation canals.

Based on the results of the study turned out to farmers swamp irrigation area Rantau Panjang does not yet have a container organization farmers group associations of water users (P3A) as mandated regulations Public Works Minister No.30 the Year 2015. However, the farmers already have eight (8) farmer groups and 1 (one) association of farmer groups. The study results on the existence of farmer groups are still less active and rarely hold group meetings.

In 2000 an irrigation canal in Rantau Panjang was renovated, then it was made on right-left the channel along with made a single door of water (intake), and there were two connecting beds to the edge of the rice field. However, the channel conditions are already a lot of not work to the maximum because it is not the maintenance of the farmer that utilizes the irrigation canals. There are many wild grass conditions and garbage cans, both organic and non-fiction garbage, added to a mud deposit already in an irrigation canal. The condition caused the Rantau Panjang irrigation canal to be used for rice fields only 300 ha of 1922 Ha.

3.2 Problems and Potential Utilization of Rantau Panjang swamp irrigation

The study results of the potential utilization of Rantau Panjang irrigation, Lawang Wetan, Musi Banyuasin District, from an area of 1.922 ha, it turns out that the results of network tracing and inventory of land owners functionally only cover 308.1 ha. The results of deepening the physical conditions of Rantau Panjang swamp irrigation are as follows:

1. There was severe damage to the main weir along the Musi River in the primary channel located in Sukarame Village, Lawang Wetan District
2. The intake condition is not functioning, so that the channel cannot be controlled

3. There was a blockage by a pile of garbage dumped by the community in the culvert crossing the Musi Banyuasin Regency road
4. The occurrence of silting of the primary, secondary and tertiary channels in most of the channels
5. Damage to the drain wall causes the water not to pass through the drain properly
6. The number of tall shrubs and grasses that grow on the edge of the canal
7. The occurrence of damage and malfunction in the physical structure of the sluice, channel, and sewer.
8. The water supply control system with almost the same water supply level causes the water not to be adjusted easily.



Figure 1. Sketch of Rantau Panjang irrigation in Lawang Wetan Musi Banyuasin District

The Rantau Panjang irrigation channel which winds through several villages, namely Rantau Panjang village, Karang Anyar village and Sukarame village, Lawang Wetan sub-district, Musi Banyuasin district (Figure 1).



Figure 2. Condition of the Rantau Panjang irrigation dam

Figure 2 shows the condition of the damaged main dam, covered with wild bush and the watergate that was not functioning.

Figure 3. is an illustration of the irrigation supplementation system that occurred in Rantau Panjang. It is explained that hydro topography in lowland swamp areas is essential in the development potential of agricultural land. Hydro topography is a picture of the relative elevation of land to the reference water level. The hydro topography of a land determines the need for lowland swamp irrigation network management.

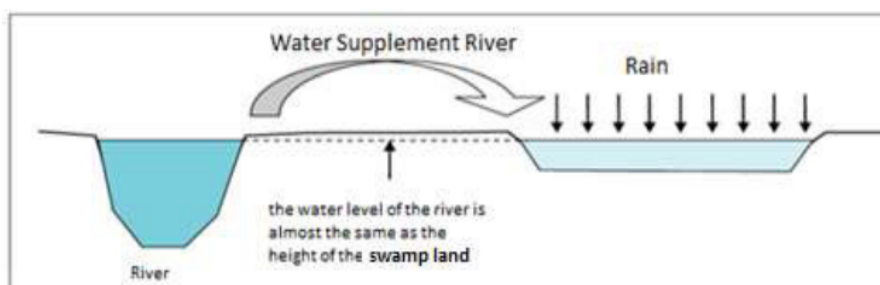


Figure 3. General conditions of Rantau Panjang

The general problems of the farming community in the Rantau Panjang swamp irrigation area are as follows: From the social and economic aspects is the lack of the welfare of farmers, it happened because the right income of farmers low and yields are not optimal, lack of knowledge of agricultural technology, lack of agricultural machinery. On average, the main livelihoods of the people in the Rantau Panjang area are partly as farmers and rubber planters with a cultivation system that is without intensive maintenance rarely fertilizes and generally uses simple technology packages. In addition, the selling price of agricultural products is still low at the farmer level.

The relationship of a social community of farmers is still there, although it had begun to fade, such as there are no mutual assistance activities related to the maintenance of irrigation channels that require energy, and the cost is not cheap. Community relations still occur, including mutual cooperation activities during the provision of rice seeds and rice harvesting. Meanwhile, land cultivation and maintenance activities are carried out on a wage system. In addition, the people of the Rantau Panjang Irrigation Area in general (the majority) still help each other and work together during celebration events and when there is a disaster where the community's sense of concern is still sufficiently maintained.

Other problems with Rantau Panjang irrigation are in the institutional sector with the following main problems:

1. Water User Farmer Association (P3A) has not been formed
 2. Farmer groups (Poktan) have been formed but are less active
 3. Group meeting and deliberation activities are rarely carried out
- There is still a lack of guidance and counseling by related agencies

Based on the problem, the potential benefits of Rantau Panjang swamp irrigation are as follows:

1. Potential local resources (*local wisdom*) that form a pattern of relationships with the environment and social relations of the Rawa Rantau Panjang irrigation area, which generally (the majority) embrace Islam, so that the socio-cultural conditions are a blend of two cultural cultures, namely a blend

of Sekayu culture and Islamic culture. The combination of these two cultures has formed the cultural character of the community to date, namely the characteristics of the community who help each other and work together during celebration events and when there is a disaster where the sense of community concern is still sufficiently maintained.

2. The potential utilization of Rantau Panjang irrigation will occur if the repair of dams, floodgates, and irrigation networks in primary channels, secondary channels of tertiary channels, and rice field processing by related agencies can increase the functional area from 300 ha to 1,000 ha. This is due to the high water discharge from the Musi River, which can drain the entire area of local irrigation.
3. Potential occurs if the formation, strengthening, and empowerment of groups of farmers using water (P3A) and farmer groups by related agencies can increase production, productivity, and index of irrigated rice for Long Rantau Panjang.
4. Hamdani and Taupik research results those strategies to improve institutional performance P3A, namely by increasing the human resources (HR) administrators and farmers in terms of knowledge, skills, and attitudes related to improvements to the water system
5. Based on analysis of the suitability of the land by the Big Centers the River Region Sumatra VIII 2019, that the level of fertility of the soil in the study area based on the availability of nutrients, generally classified as low to moderate, so that rice crops more suitable to be cultivated in this location with suitability classes potential more dominant in class S1 (very suitable) with other alternative plants is cassava in potential suitability class S2 (quite suitable).
6. The results of research by Pakpahan, Surpin and Sangkawati show that the optimization of swamp irrigation areas can be carried out by utilizing potential water sources, making *long storage* for additional water volume, optimizing operation and maintenance activities and improving irrigation networks in the paddy fields.
7. The importance of partisanship and continuous government attention in the activities of fostering and assisting farmer institutions, irrigation maintenance activities, assistance and convenience in providing production facilities and post-harvest activities

4. Conclusions

The study on the potential use of Rantau Panjang irrigation was intended to explore the potential of the irrigation area. The potential benefits of Rantau Panjang swamp irrigation, Lawang Wetan District, Musi Banyuasin Regency are as follows:

1. Potential local resources (*local wisdom*) form a pattern of relationships with the environment and social relations in the Rawa Rantau Panjang irrigation area, which generally (the majority) embraced Islam. The potential of this local resource is the strength to restore the mutual cooperation activities in all local community activities.
2. The potential benefits of Rantau Panjang irrigation will occur if the repair of dams, floodgates, and irrigation networks in primary channels, secondary channels, to tertiary channels by related agencies has the potential to increase the functional area from 300 ha to 1,000 ha. This is due to the high water discharge from the Musi River, which can drain the entire area of local irrigation.
3. Potential to increase production, productivity, and index of swamp irrigation rice cultivation if the formation, strengthening, and empowerment of water user farmer associations (P3A) and farmer groups by related agencies are carried out.
4. One strategy to improve WUA's institutional performance is to increase administrators' and farmers' human resources (HR) in terms of knowledge, skills, and attitudes related to water use.
5. The level of soil fertility in the study location based on the availability of nutrients is classified as low to moderate, so that lowland rice plants are more suitable to be cultivated in this location with the potential

suitability class which is more dominant in class S1 (very suitable) with other plant alternatives is cassava in this potential class suitability of S2 (quite suitable).

6. The research results by Pakpahan, Surpin, and Sangkawati show that the optimization of swamp irrigation areas can be carried out by utilizing potential water sources, making long storage for additional water volume, optimizing operation and maintenance activities, and improving irrigation networks in the paddy fields.
7. Continuous involvement in increasing the use of irrigation for food in the swamp irrigation area of Rantau Panjang farmers is needed in fostering and assisting institutions, maintaining irrigation maintenance, providing assistance, and facilities in providing production facilities, as well as involvement in post-harvest activities.

References

- [1] Central Bureau of Statistics of South Sumatra 2019 *Area of Rice Field Farm in Musi Banyuasin Regency* Palembang: Central Bureau of Statistics of South Sumatra
- [2] Bappeda Province of South Sumatra 2020 *Profile for Socio-Economic, Technical and Institutional Areas of Rantau Panjang Irrigation in Musi Banyuasin Regency Palembang* : Documents *Project Integrated Participatory Development Management Irrigation Program*
- [3] Great Hall of the River Region VIII 2019 *Analysis of Land Suitability of Rawa Panjang Rawa Irrigation Area. Project Report for Great Hall of the River Region VIII* Palembang: Great Hall of the River Region VIII
- [4] Great Hall of the River Region VIII 2020 *Detailed Investigation Survey of Rantau Panjang Integrated Participatory Development Irrigation Program PKM 3 by PT.Suwanda. Palembang* Palembang: Project Report for Great Hall of the River Region VIII
- [5] Hamdani and Taupik 2016 *Study on the performance assessment of the Water-Using Farmers' Association (P3A) Irrigation Area Telaga Langsat, Hulu Sungai Selatan Regency. South Kalimantan Province. Research Results Report* Banjar Baru: Faculty of Agriculture Lambung Mangkurat University
- [6] Hikam, A.S 2014 *Strengthening Food Security for Indonesia's Future 2015-2025* Jakarta: State Intelligence Agency
- [7] Ministry of Agriculture 2015 *Strategic Plan of the Ministry of Agriculture of the Republic of Indonesia 2015-2019* Jakarta: Planning Bureau of the Ministry of Agriculture
- [8] Ministry of PUPR 2016 *Decree of the Minister of Public Works and Public Housing on Data and Area of Irrigation Area Based on Authority* Jakarta: ector General of SDA, Ministry of PUPR
- [9] Ministry of Public Works and Human Settlements 2018 *Guidelines for Empowerment of Water User Farmer Association (P3A)* Jakarta:IPDMIP program. ectorate General of Natural Resources
- [10] Ministry of Public Works and Human Settlements 2018 *Swamp Technical Planning Training, Swamp Irrigation Network Planning System* Jakarta: HR Development Agency
- [11] Ministry of Internal Affairs 2018 *Guidelines for the Preparation of the Technical and Institutional Socio-Economic Profile (PSETK) of the IPDMIP Program* Jakarta: ectorate General of Bina Bangda
- [12] Ministry of Law and Human Rights 2020 *Law No.17 of 2019 concerning Water Resources* Jakarta: Ministry of Law and Human Rights
- [13] Pakpahan D. Suripin and Sangkawati S 2014 *Study of Swamp Irrigation System Optimization (Case Study of Semangga Irrigation Area, Merauke Regency, Papua Province)* Semarang: Journal of Science and Applied Civil Engineering. MKTS Journal

- [14] Really A. 2007 *Statistics: In Descriptive, Inference and Non-Parametric Studies* Jakarta: Prenada Media Plans
- [15] Waluyo, Suparwoto and Sudarwanto 2008 Inundation Fluctuations in Lebak Swamp Land and Its Benefits for Agriculture in Ogan Komering Ilir *Indonesian Hydrosphere Journal* vol **3** pp 57-66

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