

Planning Working Drawings of Irrigation Channels in Lampeantani Village

La Sianto^{1*}

¹Fakultas Teknik, Universitas Muhammadiyah Buton, Indonesia

Correspondence: siantho.civil07@gmail.com

ABSTRACT

In Indonesia there are several regions that have great potential in the agricultural sector, one of which is Lampeantani Village, Rarowatu District, Bombana Regency. The local government is well aware of the potential possessed by the region so it is very supportive of activities related to the agricultural sector, because the number of problem areas is large, the handling needs to be done on a priority scale. One way is to provide a picture of a work plan to repair the existing canals in Lampeantani Village. The implementation of Community Service activities, namely the working drawings of the irrigation canal, is running very well and smoothly according to the previous activity plan. This activity began with outreach with the Village Government, then continued with site visits and field measurements. The result of this community service is a drawing of an irrigation canal plan. Based on the results of the implementation of this PKM, it is hoped that the Lampeantani Village Government can immediately carry out work based on the existing drawings.

Keywords: Irrigation Channels; Lampetani Village; Working Drawings

Copyright © 2023 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution ShareAlike 4.0 International (CC BY-SA 4.0)

1. Introduction

Water is one of the most important elements in life, without water, life cannot take place. Therefore, the State always tries to be able to maintain harmony and utilize water resources for the survival of its population. One of the efforts to utilize water resources is irrigation, Development of an irrigation area can be done in two ways, namely extensification and intensification. This extensification is an effort to increase production by opening new rice fields and their supporting facilities. Intensification is an effort to increase the usability of an irrigation network with rehabilitation so that production increases (Sutrisno 2012). Groundwater irrigation network is an attempt to extract water from below the ground surface (lifting/moving water from a lower place to a higher place) with the help of a water pump, so that it can distribute water for irrigation purposes. The purpose of direct irrigation is to moisten the soil in order to achieve a good soil condition for plant growth (Utama, Saves, and Patriadi 2022). In agriculture, water is very important for plant survival. Efforts made by humans to meet the needs of water on agricultural land is called irrigation (Purnama, Norken, and Yekti 2018).

Agriculture is one of the economic sectors which is the main livelihood for most people in rural areas, as well as for people in Pundong Hamlet, Srihardono Village, Pundong, Bantul. The people in Dusun Pundong have relied on agriculture for generations as their source of livelihood. Agricultural products in this hamlet are diverse, but are more dominated by rice farming which produces the main food ingredient is rice (Alkis and Ferdiansyah 2019). In efforts to increase agricultural productivity and food security, the fulfillment of water has an important role. Many efforts have been made to fulfill it,

including by utilizing surface water sources such as rivers and reservoirs, as well as deep groundwater sources using drilled wells. In addition to the need for water, plants also need a place to grow (land or rice fields). Paddy fields and good land for agriculture are land that is easy to work with, is productive and fertile and is sufficient for water needs (Sianto, La 2022).

In Indonesia there are several regions that have great potential in the agricultural sector, one of which is Lampeantani Village, Rarowatu District, Bombana Regency. The local government is well aware of the potential possessed by the region. so it is very supportive of activities related to the agricultural sector, because the number of problem areas is large, the handling needs to be done on a priority scale. One way is to provide a picture of a work plan to repair the existing canals in Lampeantani Village. Based on the Program for Development and Management of Irrigation Systems in Indonesia (2018) In general, the general conditions and strategic issues regarding the management of irrigation systems include the potential for surface water in Indonesia of 2.7 trillion m³/year, 691.3 billion m³/year can be utilized. Of this potential, 222.6 billion m³/year has been utilized, including for the irrigation sector of 177.1 billion m³/year. The development and management of irrigation systems aims to realize the benefits of water in agriculture. Development and management of irrigation systems carried out by the Central Government, provincial regional governments, or district/city regional governments in accordance with their authority, is responsible for the development and management of primary and secondary irrigation systems (Kementerian Pekerjaan Umum dan Perumahan Rakyat 2018).

Irrigation is an effort to supply and regulate water to support agriculture, the types of which include surface irrigation, swamp irrigation, underground water irrigation, pump irrigation. Irrigation is intended to support farming productivity in order to increase agricultural production in the context of national food security and community welfare, especially farmers which is realized through the sustainability of irrigation systems. The purpose of irrigation is to drain water regularly according to plant needs when the ground water supply is insufficient to support plant growth, so that plants can grow normally. In addition to being influenced by application procedures, efficient irrigation is also determined by the need for water to achieve the available water conditions needed by plants. Construction of irrigation canals is necessary to support the provision of food, so that the availability of water in irrigation areas will be fulfilled even though they are far from surface water sources (rivers). This is inseparable from irrigation engineering efforts to provide water in the right conditions, economically in order to obtain maximum results in agriculture by taking into account the irrigation system.

Irrigation Area (D.I.) is a land area whose water needs are met by an irrigation system. Irrigation areas are usually rice fields that require a lot of water for rice production. To increase production in paddy fields, a reliable irrigation system is needed, namely an irrigation system that can meet the needs of irrigation water throughout the year. Therefore, it is necessary to have a balance between the need and availability of water, including the need for water in agricultural areas where the water taken from the river through irrigation canals must be balanced with the amount of water available. Water demand in agricultural areas is influenced by evapotranspiration, percolation, layer replacement, and effective rainfall (Mulyadi 2021). The need for food which continues to increase in line with the increase in population requires continuous and sustainable efforts to increase food production. The irrigation sector is one of the important factors and can provide a comprehensive contribution in increasing food production, especially rice for the Indonesian population, is an element that needs to be developed further (Anjarwati 2017).

Based on data from the Control of Plant Pest Organisms (POPT) of Purworejo Regency, on September 23th 2015 there was a drought in 6 sub-districts namely Bayan, Banyuurip, Purwodadi, Kaligesing, Bener and Gebang. The total area affected by rice drought reached 767 Ha. Drought occurred in the 6 sub-districts, two of which were the Boro Irrigation Area. Some speculation arose how this could happen. However, from the observations that have been made (Figure 1), the cause of the downstream drought for the Boro Irrigation Area is the performance of the irrigation canal in terms of decreased serviceability. To meet the need for irrigation water downstream, farmers are forced to take water from groundwater wells, of course this is a big loss for farmers. Efficiency in the use of irrigation water is the main thing in areas with limited water availability. This is related to the large loss of water in irrigation networks due to evaporation, taking water for other purposes, or leakage along the canals. Based on the Canal Section Irrigation Planning Criteria (KP-03), the amount of water loss in irrigation networks can be minimized by improving the water management system and physical improvement of irrigation infrastructure (Drajat, Achmad Rafi'ud, Fatchan Nurohmad 2017).

The development and management of irrigation systems aims to realize the benefits of water in agriculture. The development and management of irrigation systems carried out by the Central Government, provincial regional governments, or district/city regional governments in accordance with their authority, is responsible for the development and management of primary and secondary irrigation systems. The development and management of the irrigation system referred to above is carried out in a participatory, integrated, environmentally sound, transparent, accountable and fair manner by prioritizing the interests and participation of the farming community/P3A/GP3A/IP3A. Participation of the farming community can be channeled through associations of farmers using water in their working areas. Participation of the farming community/P3A/GP3A/IP3A as referred to above, is carried out to increase the sense of ownership, sense of responsibility, and increase the ability of the farming community/P3A/GP3A/IP3A in order to realize efficiency, effectiveness and sustainability of irrigation systems.

The development and management of irrigation systems is carried out by utilizing water resources based on the interrelationships between rainwater, surface water and groundwater in an integrated manner by prioritizing the utilization of surface water. Development and management of irrigation systems, carried out with the principle of one irrigation system, one unit of development and management, taking into account the interests of users of irrigation water and users of irrigation networks in the upstream, middle and downstream parts in harmony. In the event that the development and management of irrigation systems is carried out on tertiary irrigation systems, P3A has rights and responsibilities in the development and management of tertiary irrigation systems. The rights and responsibilities of farming communities in the development and management of irrigation systems include: a. carry out the development and management of tertiary irrigation systems, b. maintain the effectiveness, efficiency, and order in the implementation of the development and management of the tertiary irrigation system which is his responsibility, and c. give approval for the construction, utilization, conversion, and/or demolition of buildings and/or irrigation canals on tertiary irrigation networks based on a participatory approach (Kementerian Pekerjaan Umum dan Perumahan Rakyat 2019).

In the learning process the development and management of irrigation systems consists of 3 three) main materials, namely development and management of irrigation systems, development of participatory irrigation systems, management of participatory irrigation systems, requirements and procedures for participation, monitoring, evaluation and supervision(Kementerian Pekerjaan Umum dan Perumahan Rakyat 2019). In this

service the stage taken is the development and management stage of the irrigation system by providing a picture of the work plan.

2. Method

In order for this irrigation planning to run smoothly, the service team will socialize and coordinate with the Village Government and local residents before taking measurements in the field. Furthermore, the service team will ask for the assistance of the Village Government to review the location that will be used as service. During the field measurement, the RT, RW and group heads invited the participants to attend a presentation on the understanding of the Steps that would be carried out in this planning. Socialization and training are carried out jointly by the PkM team to the community. The results of this plan are expected to be used by the Village Government and Villagers to overcome water shortages when the dry season arrives so that they can easily carry out activities in rice fields without having to think about the problem of water shortages.

3. Result and Discussion

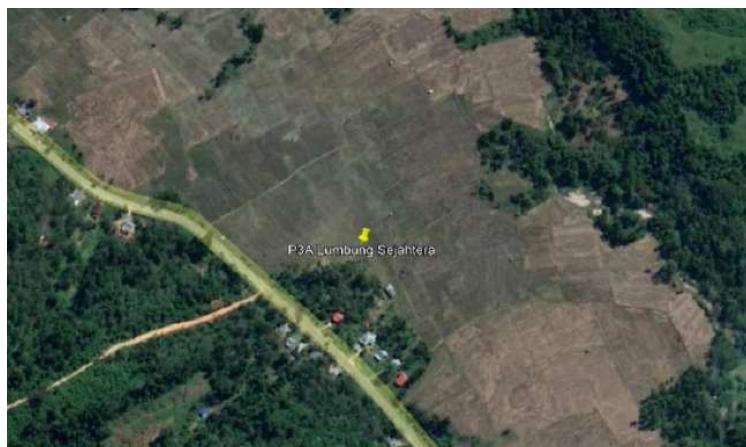
Before carrying out community service activities, the service team needs to make the following preparations:

- a. The dedication team determines or surveys the location of the service
- b. The Service Team gets a Letter of Assignment or recommendation from LPPM Muhammadiyah University of Buton.
- c. The Service Team holds meetings to divide tasks and develop service program activities.
- d. The service team prepares a service work plan. In this case contacting the Village Head that community service will be carried out in Lampeantani Village and a site inspection will be carried out for technical planning.

The service was held in Lampeantani Village, Rarowatu District, Bombana Regency on December 1st 2022. The service was carried out in 2 stages:

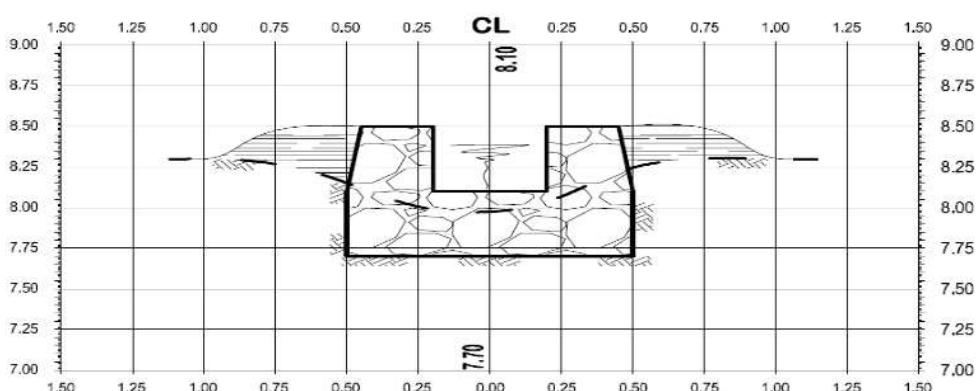
- a. The opening contains remarks from the head of the service team which contains the purpose of holding community service as a form of Tri Dharma for Higher Education, University of Muhammadiyah Buton Lecturers. The Head of Lampeantani Village as the host of the partners also gave a speech for the service to be carried out

- b. Survey the location of irrigation canals that will be planned



Picture 1. Irrigation Canal Location Map

c. Irrigation channel planning based on conditions in the field



Picture 2. Gambar Rencana Saluran Irigasi

4. Conclusion

The implementation of Community Service activities, namely the working drawings of the irrigation canal, is running very well and smoothly according to the previous activity plan. This activity began with outreach with the Village Government, then continued with site visits and field measurements. The result of this community service is a drawing of an irrigation canal plan. Based on the results of the implementation of this PKM, it is hoped that the Lampeantani Village Government can immediately carry out work based on the existing drawings.

References

- Alkis, C. D. A., & P. Ferdiansyah. (2019). Optimalisasi Irigasi Berbasis Partisipasi Masyarakat Di Area Persawahan Kelompok Tani Sedyo Makmur, Dusun Pundong. *Prosiding Seminar Hasil PKM* (November):459-63.
- Anjarwati, Kaelisma. (2017). Analisa Jaringan Irigasi Pada Daerah Irigasi (D.I) Tepian Buah Kabupaten Berau Kalimantan Timur. *Jurnal Kurva S* 1(1):1-10.
- Drajat, Achmad Rafi'ud., Fatchan Nurohmad., & Rachmad Jayadi. (2017). Analisa Efisiensi Saluran Irigasi Di Daerah Irigasi Boro Kabupaten Purworejo, Provinsi Jawa Tengah. *Jurnal Inersia* XIII(2):154-66.
- Kementerian Pekerjaan Umum dan Perumahan Rakyat. (2018). *Program Pengembangan Dan*

Pengelolaan Sistem Irigasi di Indonesia. Jakarta: Direktorat Jenderal Sumber Daya Air.

Kementerian Pekerjaan Umum dan Perumahan Rakyat. (2019). *Modul Pengembangan dan Pengelolaan Sistem Irigasi Partisipatif.* Jakarta: Direktur Bina Operasi dan Pemeliharaan Direktorat Jenderal Sumber Daya Air.

Mulyadi, Ansadilla Niar Sitanggang. (2021). Analisa Sistem Jaringan Irigasi Tersier Desa Citarik Kecamatan Pelabuhan Ratu Kabupaten Sukabumi. *Jurnal Kajian Teknik Sipil* 6(1):46–60.

Purnama, Made Bayu., Nyoman Norken., & Mawiti Infantri Yekti. (2018). Perencanaan Jaringan Irigasi Air Tanah Desa Penyaringan Kecamatan Mendoyo Kabupaten Jembrana. *Jurnal Ilmiah Teknik Sipil* 22(1):43–52.

Sianto, La., & Muhammad Chaiddir Hajia. (2022). Perencanaan Saluran Irigasi Tersier Desa Ambuau Indah Kec. Lasalimu Selatan Kabupaten Buton. *Jurnal Abdimas Indonesia* 2(1):60–64.

Sutrisno. (2012). Perencanaan Jaringan Irigasi Karpenang Pada Petak Tersier Di Kecamatan Manding Kabupaten Sumenep. *Jurnal Pertanian Cemara Sumenep* 9(1):55–63.

Utama, T. S., F. Saves., & A. Patriadi. (2022). Perencanaan Saluran Irigasi Pada Area Persawahan Desa Mejoyo–Kecamatan Bangsal–Kabupaten Mojokerto. *Jurnal Ilmiah Teknik Sipil* 05(September):43–52.