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ARTICLE

Study On Development Of Independent Rice Mile Unit (IRMU) In Central Lombok District[1]

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Abstract

The strategic role of agriculture is in line with the goals of national economic development, namely: (1) improving the welfare of the indonesian people; (2) accelerating economic growth, reducing poverty; (3) providing employment; (4) maintaining the balance of natural resources and the environment. The research entitled "Study on the Development of Independent Rice Mile Unit (IRMU)in Central Lombok District" aims to determinate the feasibility of building an Independent Rice Mile Unit (IRMU) based on five aspects of plants feasibility, including demographic characteristics, aspect of the management of grain and rice (including among them grain and rice distribution), socio-economic factors environmental elements, and accessibility aspects in Central Lombok regency. The method used in this research is a descriptive survey approach. The study was conducted in March –July 2019. Data sources used in this study were primary data, namely informants, and secondary data, namelydocuments, journals, etc. The data collection techniques used were observation, interviews, documentation, literature, and questionnaires. The data analysis technique used is descriptive analysis. This study indicates that the placement of IRMU locations in the Central Lombok Regency is very suitable because it is supported by all aspects studied.

Keywords: Development; Rice; Mile

1. Introduction

The agricultural sector has a strategic role in national and regional development. The strategic position of agriculture is illustrated through its tangible contribution through capital formation, food provision, industrial raw materials, feed, bioenergy, absorbing labor, foreign exchange, income sources, and environmental conservation through environmentally friendly farming practices.

The efficient development of food crop agriculture is expected to produce sufficient output to meet market needs which tend to increase. In addition, agricultural development is expected to increase farmers' income, competitiveness, added value, expand markets both domestically and abroad, increase food security, and create linkages and integration with the industrial and service sectors.

West Nusa Tenggara Province and most provinces in Indonesia still rely on the agricultural sector as the leading sector of its economy. The agricultural sector contributes significantly to forming the GRDP of the Province of NTB, which ranges from 20.23 percent to 26.15 percent. During the last ten years, the agricultural sector's contribution reached its highest figure in 2018 of 26.15 percent (Bappeda, 2018). West Nusa Tenggara Province is a developing province with one of its development missions being the

agricultural sector, especially the rice commodity. In the last 5 (five) years, the growth of production, productivity, and the harvested area has increased quite significantly. However, this increase has not been followed by adequate post-harvest technology support. Farmers still do post-harvest traditionally so that the quality of the rice produced is relatively not standardized and heterogeneous. This condition is compounded by the length of distribution channels (trade system) from farmers to factories or consumers.

The growth of production, productivity, and area of rice harvested land in NTB has not been able to increase income for rice farmers in West Nusa Tenggara. This is reflected in the large number of small/poor farmer households (RTP) in NTB, which are still quite large. Based on 2017 agricultural census data, it is known that the number of smallholder farmer households in NTB was 350,130 RT (37,34%) of the total 937,743 farmer households (RTP). In addition to the high production costs, the low quality of rice commodities, and the lack of post-harvest handling and product processing, the main problems in developing rice commodities in NTB are the joint capital of farmers and limited partnerships in marketing results (Distanbun TPH, 2018).

For this reason, strategic efforts are needed to encourage increased value-added yields and increase income and welfare of the community/farmers, namely by building production processing facilities (post-harvest) Rice Mile Unit/RMU, establishing partnerships between farmers and investors as well, and providing physical commodity markets to expand rice agribusiness development opportunities (Ashar and Iqbal, 2013).

The construction of post-harvest processing installations (Rice Mile Unit/RMU) is to improve quality and maintain supply continuity and increase added value and competitiveness of farmers (supporting system). In addition, the construction of post-harvest processing installations is also one of the efforts to spur regional economic growth by increasing job opportunities, increasing income, and increasing farmer welfare. The existence of partnerships between farmers and investors is expected to overcome the problems of low managerial and farmer capital, lack of cultivation technology, uneconomical handling, and processing of results (Sulardjo, 2014).

The existence of seasons and weather causes rice products to be easily damaged and their production to be erratic, thus requiring a mature and well-planned marketing strategy. Therefore, it is necessary to provide a commodity market which, apart from being able to provide greater market access and broad market information without being limited by geographical distance, is also able to reduce the number of layers of intermediaries to allow a more significant portion of profits to be delivered directly to farmers.
Institutions in the agricultural sector include production institutions/farmer institutions, production facilities institutions, capital/financial institutions, agricultural product processing institutions, mechanization institutions, and marketing institutions (Gunawan, 2002). For farmer institutional problems, the main concern is that farmers are not yet optimal in utilizing institutional elements such as farmer groups (spoken), Gapoktan, or farmer cooperatives. Through these institutions, the capacity of farmers can be increased. In addition to various information that farmers can obtain through institutions, farmers' access to production facilities (fertilizers and medicines), capital/financial (KUR credit, KUBE), agricultural product processing, mechanization, and marketing is getting bigger.

Based on the problems above, research has been carried out on "Study on Development of Independent Rice Mile Unit (IRMU) in Central Lombok Regency." This study aims to determine the feasibility of developing an Independent Rice Mill Unit (IRMU) based on five aspects of factory feasibility, including demographic characteristics, aspects of grain and rice trading systems (including distribution of grain and rice), aspects of raw materials, utilities, and labor, aspects of location feasibility, environmental aspects in Central Lombok Regency.

2. Materials and Methods

The research method used is descriptive with a survey and observation approach. The sampling method used was purposive sampling, the data collection methods used were observation and interviews. In this study, data processing in editing, coding, and tabulating used quantitative descriptive methods (Nazir, 2011).

Research data collection activities were carried out from March to July 2019 by covering data collection and processing activities.

The type of data used in this research consists of two types of data, namely primary and secondary data, both qualitative and quantitative. Primary data is data that is directly related to research. Secondary data is additional information to support research. Primary data sources were obtained through an interview process with related parties such as business owners and business workers with a questionnaire guide that had been prepared. Secondary data sources come from various literature, both from books and the internet, regarding the results of data publications from related institutions and agencies relevant to the research.

The primary data collection method is by conducting direct observation and interviews using a questionnaire guide. The use of a questionnaire is needed to obtain information for research purposes. In addition to the questionnaire, note-taking tools and documentation tools are required. Secondary data collection methods can be in the form of literature studies to support data collection in the field (Sugiyono, 2010).

Data analysis used in this research is quantitative method. The data in the quantitative approach is processed by calculating using calculating tools such as calculators and additional software; the results will be displayed in tabulated form so that they can be explained descriptively.

3. Results and Discussion

3.1 Demographic Aspect

Based on its natural conditions, Central Lombok Regency can be divided into 3 (three) main areas, namely: North, Central, and South. The northern region is a high flat area at the foot of Mount Rinjani with relatively high rainfall, the potential for agricultural development, especially horticulture, and an agrotourism area. The middle part of the lowland area with a vast expanse of rice fields is potential for rice development, secondary crops, vegetables, etc. The southern region is a hilly area with relatively low rainfall, potentially developing dryland agriculture (BPS Loteng, 2018).

The potential area of rice fields (raw size of rice fields) is 51,189 hectares consisting of 23,115 hectares of technical irrigation, 13,707 hectares of technical irrigation, 3,155 hectares of simple irrigation/village irrigation, and 11,212 hectares of rainfed land and supporting resources to accelerate the development of commodities in rice fields with the availability of irrigation, in the form of check dams, dams, wells, and others.

The agricultural land productivity for irrigated rice fields, one hectare of rice fields can produce as much as 4.9 tons of rice. The productivity of agricultural land for rainfed rice fields, one hectare of rice fields can have as much as 4.9 tons of rice.

The year 2013 showed that the planting area of 93,578 Ha could produce 465,150 tons of rice. Meanwhile, the average yield loss in the last 5 years was 10.02%, higher than the 2009 yield loss, 9.95%. The distribution of rice varieties is 21 varieties with an area of 89,916 Ha, non-hybrid rice, which is dominated by Ciliwung 36,828 Ha, Situbagendit 18,798 Ha, Cigeulis 10,905 Ha, Inpari 10 7,010 Ha, and Inpari 7 4,525 Ha.

In agricultural activities, obstacles experienced by farmers are erratic weather, pests, and rainfall, especially for rainfed rice fields.

3.2 Aspects of Grain/Rice Trading System

The rice/grain trade system in Central Lombok Regency involves several interrelated trading systems. Based on the observations, the trading system institutions found in the research locations generally consist of; farmers, slashers, grinders, wholesalers, wholesalers, retailers, farmer organizations, and Dolog. These trading system institutions vary from one research location to another. This causes each research location to have a trading system channel type of institution. Institutional functions, market structures, and market behavior vary. This study found 4 (four) rice/grain trading tracks taking place in Central Lombok Regency. A more detailed description is contained in the following Trading System Structure.

The four channels;

- Channel I: Farmers → Slasher → Milling (Micro) → Self Consumption and Towards Consumer
- Channel II: Farmers → Milling (Macro) → Wholesalers (Surabaya, Blitar, Bali + Main Market → Retailers → Consumers

- Channel III: Farmers + Milling (Macro) → Wholesalers (Surabaya, Blitar, Bali + Main Market → Retailers → Consumers
- Channel IV: Farmers → Farmers Organization → Dolog → Main Market → Retailer → Consumer

3.3 Socio-Economic Aspect

The agricultural potential is still significant at 51,189 hectares, so most of the population in this area works in the farm sector. In developing agricultural businesses, the people of Central Lombok Regency are very open to the emergence of new investments in the farm sector as long as they can contribute to the surrounding community. The community accepts investment as long as it does not cause environmental impacts that can harm the community. Society needs comprehensive information about the effects of the technology used.

Security conditions also support this. Up to the time of observation and interviews, it was not found that there had been a social conflict, which helped the development of agricultural investment in this area.

Furthermore, in Central Lombok Regency, there is also an area zoning which is the center of the grain processing factory (healer) along the Kopang-Bujak-Darmaji road, which indicates this area is one of the centers of grain distribution in Central Lombok.

It's just that what is worth worrying about is that there will be competition with the dealer owners throughout this area. This condition can be a buffer as long as coordination and cooperation become an approach strategy. Another thing, as one of the centers of grain distribution in Central Lombok Regency, the contestation between investors and merchants will also have the potential to cause vulnerability.If you look at the rice/grain production trend in Central Lombok Regency, it will undoubtedly significantly affect investment in agriculture in the Regency. The rice/grain production trend is also followed by the direction of planted area and productivity trend.

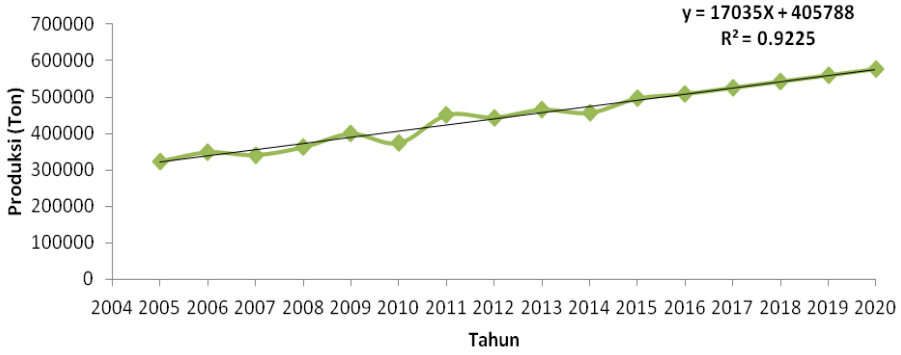

Figure 1. Rice Production Trends and Projections for 2005-2020 in Central Lombok Regency.

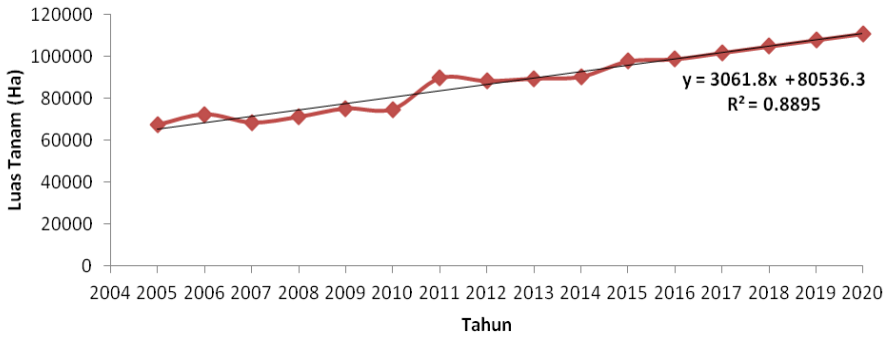

Figure 2. The trend of Rice Cultivated Area and Projection for 2005-2020 in Central Lombok Regency.

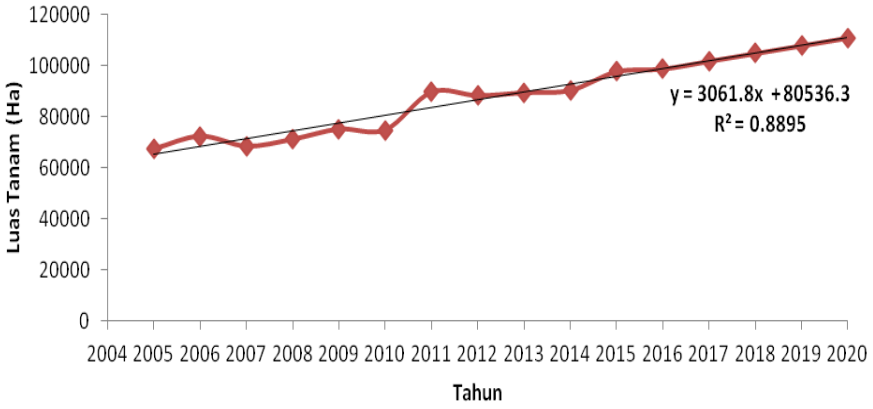

Figure 3. Rice Productivity Trends and Projections for 2005-2020 in Central Lombok Regency.

Rice production in Central Lombok Regency between 2005 - 2015 increased by 17,034.9 tons per year and is projected to reach 576,137 tons in 2020.

3.4 Environmental Aspect

The land used for the RMU location has an area of 2 ha; of course, it is broader than the company's desire, requiring a land area of 1.5 ha. Furthermore, the land is very existing because it is a former heller so that it is easy to develop and does not require high costs to build a new one. Prospective land used as the IRMU site is flat and has been paved (drying rice).

River water has a strategic role in human life and other living things. The river has a dynamic nature, so its use can potentially reduce the value of the benefits of the river, and other impacts can affect the environment widely.

From the aspect of water availability, the actual river water around the IRMU placement site in Central Lombok Regency flows throughout the year. Groundwater is excellent, and the water discharge is plenty. The community well water is clean, and if the developer needs PAM water, it will be easy to cultivate.

Water pollution can be interpreted as a change or deviation of various properties of water from its normal state and purity. Water pollution can occur directly and indirectly. Direct pollution occurs due to household, industrial, business, and attention waste disposal. Indirect pollution occurs in water sources, such as acid rain. Based on PP no. 82 of 2001, the main parameters for assessing water pollution include water temperature, electrical conductivity (DHL), pH, dissolved residue (TDS), suspended residue (TSS), Biological Oxygen Demand (BOD), COD, sulfate, DO, Nitrite, Nitrate, phosphate, detergent, ammonium, oil and grease, iron, lead, zinc, copper, E.coli, and total coliform.

The quality of the Manhal river in Central Lombok Regency has exceeded the Class II water quality standards for phosphate, detergent, and BOD with values of 0.32 mg/L, 0.05-0.11 mg/L, and 3, respectively. 8-7.9 mg/L

The microclimate (CH, Temperature, Air Tech, Humidity, Wind Direction) was adequate, and the differences between locations were not significant. Air is a natural resource that must be protected for life, human life, and other living things. Air has a significant meaning for living things and the existence of their habitats. To get the air by the desired quality level, it is essential to control air pollution. Air consists of various gases whose ratio is not fixed, depending on the state of air temperature, air pressure, and the surrounding environment. In the air, there is oxygen (O2) for breathing, carbon dioxide (CO2) for photosynthesis, and ozone (O3) to withstand ultraviolet rays.

Ambient air is free air from the earth's surface in the troposphere, which is in the jurisdiction of the Republic of Indonesia, which is needed and affects the health of humans, living things, and other elements of the environment. Ambient air quality is the level of substances, energy, and other components above the free air. In contrast, the status of ambient air quality is the state of air quality in a place at the time of the inventory. Air pollution is defined as a decrease in air quality so that the air experiences a reduction in quality in its use which ultimately cannot be used as it should. Air pollution is always associated with sources of air pollution, namely moving sources (generally motorized vehicles), stationary sources (normally industrial activities), and other activities. Air pollution control is always related to a series of control activities that lead to air quality standards. Air quality standards, both emission and ambient air quality standards are prepared in the context of controlling air pollution.

Table 1. Air Quality of Central Lombok Regency

No	Parameter	Quality Standard (µg/Nm3)	Ds. New Arrival		cage		Change		good luck		Bebuak Kopang	
			H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
1	TSP	-	2.8	2.86	1.4	4.28	2.8	2.86	2.8	4.28	1.4	2.86
2	Pb (air)	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
3	SO2	900	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
4	CO	30,000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
5	NO	400	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
6	NO2	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
7	NO3	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
8	CO2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
9	Ambiant Temp	-	31	20.9	32	36	31	36	33	36	33	34
10	Gas Temp	-	30	30	32	35	30	31	30	35	29	32

Source: primary data processed

Rain is the main component in hydrological analysis, both in hydraulic building design and water resource management, such as in analyzing the water balance, which includes the amount of water availability and water demand. The primary input in the analysis is rain data. Considering that this analysis of rain data is the beginning of the study of every hydraulic building design and planning, the treatment of this input needs to be done carefully.

Analysis of planned rainfall is used to determine the maximum amount of rain with a specific return period which will be used in calculating the planned discharge. The method used for the calculation of rainfall, namely the statistical method or distribution method on the maximum daily rainfall of the watershed average. Analysis of planned rain can be carried out using several types of distribution, including Normal Distribution, Log-Normal 2 Parameter Distribution, Log NormalLog-Normal 3 Parameter Distribution, Gumbel Distribution, Pearson Type III Distribution, and Log Pearson Type III Distribution.

The watershed region (DAS) with high utility in the Lombok river basin is 55 watersheds from 1947 watersheds in the Lombok WS. The number of 197 watersheds refers to the provisions of Presidential Decree (Kepres) No. 12 of 2012 concerning the Determination of River Basin.

Table 2. Central Lombok Regency Utility Watershed

No	Watershed name	Area (KM2)	Water Potential (Million m3)
1	Bentek watershed	31.77	24.67
2	Hurry up watershed	21.27	16.50
3	Watershed Support	43.12	39.75

4	Segara Watershed	127,00	137.37
5	The Tiu Watershed Has Disappeared	52.06	48.99
6	Luk . watershed	43.59	39.76
7	Watershed Classifier	5.51	5.07
8	Sidutan Watershed	48.69	45.18
9	Pebali Labah Watershed	13.17	11.31
10	Amor Amor . watershed	60.29	56.45
11	Rembat watershed	3.39	2.34
12	Lebak watershed	3.72	2.52
13	Watershed of Menangen	4.16	2.77
14	Coangen watershed	33.22	28,88
15	Reak watershed	37.84	35,20
16	Bird Watershed	103.68	71.58
17	Belik watershed	7.93	5.43
18	Mentareng watershed	9.23	5.88
19	Jackfruit watershed	32.55	21.60
20	Rajak watershed	17.11	11.59
21	Sembelia watershed	57.87	38.02
22	Village Watershed	72.97	42.08
23	Tanggek watershed	67.70	38.23
24	Kukusan Watershed	117.88	65.46
25	Tojang watershed	38,88	19.02
26	Geres Serodang watershed	60.64	34.00
27	Belimbing Watershed	91.02	61.40
28	Aik Ampat Watershed	82.42	28.53
29	Watershed Wins Paok	77.73	59.23
30	Moyot watershed	24.96	15.22
31	Trough watershed	120.02	85.73
32	Watershed Rere Penembem	57.72	35.14
33	Pemkomg watershed	27.31	17.30
34	Aruina watershed	5.22	3.34
35	Temodo watershed	28.34	18,12
36	Peak watershed	34.70	21.30
37	Pare Change Watershed	34.13	18.52
38	Supak watershed	9.78	5.44
39	Renggung Perempung watershed	255.49	179.03
40	Lamin Bangket Watershed	9.74	6.18

41	Balak watershed	26.74	17.23
42	Mawun Watershed	8.78	5.70
43	Bengkang watershed	10.93	6.59
44	Siung watershed	12.92	7.71
45	Rainbow Watershed	66.97	40.91
46	Kelep . watershed	108.75	66.28
47	Central Java watershed	38,50	19.99
48	Dodokan watershed	572.17	400.02
49	Watershed Babak	257.17	248.01
50	Kelongkong watershed	33.04	21.25
51	Watershed	25.54	19.24
52	Ancar watershed	22.74	22.71
53	Jangkok watershed	167.92	193.76
54	Midang watershed	33.07	34.69
55	Meninting watershed	114.37	95.46

Source: primary data processed

3.5 Accessibility Aspect

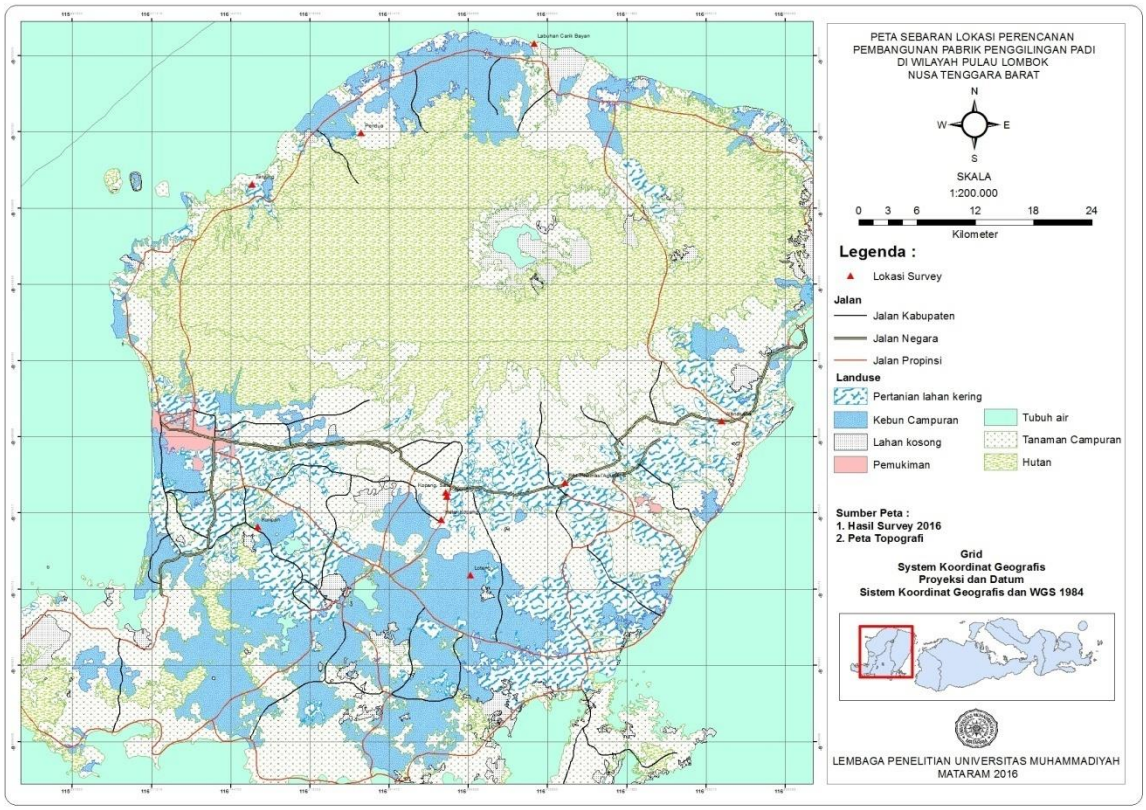

Figure 4. Distribution Map of IRMU Development Planning Locations.

Accessibility is very suitable because it passes through a country road. The width of the road at the location observed is an average of 8 m²; this is very appropriate for a developer company if using the road for production distribution using large capacity large-capacity vehicles. The capacity of the road under study is based on the load that can be passed, which is 20 tons.

Access to the Main Street in Central Lombok Regency is directly connected. Meanwhile, access to the port in Central Lombok Regency is relatively moderate and heavy traffic. Lembar Harbor in West Lombok Regency and Sembelia Port in East Lombok Regency have access to port routes.

4. Conclusions

Based on the findings and studies of various aspects, it can be concluded that the placement of the IRMU location in Central Lombok Regency is very appropriate because it is supported by all elements that have been researched and studied.

Conflicts of Interest

The authors declare no conflict of interest.

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