

The Analysis of Land Suitability for Development Strategic Planning of Vannamei Shrimp Farms in Palang Coastal

Suwarsih¹, Marsoedi², NHarahap², Mohammad Mahmudi²

¹Postgraduate Program, Faculty of Fisheries and Marine Science, University of Brawijaya Malang-Indonesia

²Lecturer Faculty of Fisheries and Marine Science, University of Brawijaya Malang-Indonesia

Abstract: *The purpose of this study is to identify the resource potential of coastal areas; especially the District Palang embankment land based physical and bio-physical conditions, by analyzing the land suitability classes' vannamei shrimp culture ponds in coastal areas of the District Palang. The analysis method used in this research is the overlay method and the method of scoring. The location study was conducted in the coastal District of Palang Tuban in East Java province, while the time held on December 1, 2014 until February 30, 2015. The results show that the identification of land in coastal areas Palang districts are composed of pond soil type and litosol alluvial types and geological conditions/land in coastal areas of the District Palang generally has a slope between 0-2% which lies between 0-100 asl, for land suitability analysis is based on acquired all coastal villages in the district Palang are very appropriate categories, Palang District of coastal areas generally have high levels of land suitability ranging from very suitable (S1) of 231.40 ha (63.69%), in line (S2) of 70.40 ha (19.38%), up to quite fit (S3) of 37.60 ha (10.34%).*

Keywords: *Land Suitability, Pond Development Strategy, Vannamei*

I. Introduction

Ponds in coastal areas the District Palang is one type of habitat that is used as a place for brackish water aquaculture activities. Factors that may cause environmental degradation are activities aquaculture continuous that is on the mark with his declining water quality. Environmental problems are often encountered in farming activities such arrangement aquaculture development areas that have not been paying attention to the environmental carrying capacity of improper management, pose a risk to the environment with all aspects of the complications in the long term. The need for analysis of the carrying capacity of the waters in order to determine the condition of land suitability for cultivation of vannamei shrimp farms in coastal areas Palang District of Tuban (Suparjo, 2008; Panjara, 2004; Sutanto, 2005).

Palang sub-district Tuban has an area of 72 km² which consists of 19 villages, which are divided according to the land use is Rice: 1754.8 ha, fields: 3160.2 ha, yard: 789.4 ha, 930.1 ha of forest, ponds: 401.8 ha and others: 151, 8 ha.

Based on the data from the Department of Fisheries and Marine Tuban, 2014, the District Palang has an area of 363.30 ha of farms with farmers as much as 619 people. Commodities were Cultivated in District Palang, most of vannamei shrimp and some are Cultivated in polyculture of milkfish and vannamei shrimp. Most of the farmers during the dry season utilizing as salt ponds and ponds during the rainy season to Cultivate milkfish and shrimp. Cultivation techniques used by growers in District Palang mostly using traditional techniques, good for polyculture cropping patterns, as well as to monoculture shrimp or milkfish, whereas semi-intensive technique only slightly and no use of intensive techniques.

Physical conditions which include soil texture indicate the quality of the land itself, and it can be shown by the distribution of soil particle and the presence or absence of pyrite and peat pond location (Mustafa, et al 2007).

Utilization of land use is still very possible, on the basis of land area available for cultivation in the coastal spread in large numbers, species that have been successfully cultivated quite a lot. Based on this assessment needs to be conducted study analysis of land use in coastal areas to find out how big the potential of land that can be used as an embankment land for the purpose of improving land use in coastal areas of the District Palang.

The objectives to be achieved in this research is to identify the resource potential of coastal areas, especially the District Palang embankment land based physical condition and analyze land suitability classes vannamei shrimp culture ponds in coastal areas of the District Palang.

II. Method

This research was conducted at the Coastal District of Palang Tuban in East Java province, which is used as a study area are 19 villages, an area of 72 km²Palang sub district. The sample in this study to analyze the suitability of land for the development of strategic planning vannamei shrimp farms in coastal areas Palangis

using the study population. The variables in this study include the slope of land in coastal areas, soil texture, soil pH, land use, precipitation, accessibility, location distance from the sea.

The analysis method used in this research is the overlay method and the method of scoring. Overlay the method of overlaying a data handling system in land elevation by hand, by overlaying by combining multiple maps containing information required or to match the desired criteria or requirements in the characteristics of the land.

The initial step in this analysis framework is the mapping of the land. Map land units obtained by clicking the map overlay-slope, landform maps, land use maps and maps of soil types.

Analysis overlaying to acquire land suitability level aquaculture is based on criteria (Panjara et al, 2006). Land suitability class research refers to the calculation of the index approach overlay models, is used to simplify see a summary of data through grouping data into a table, the value for each class of suitability is: S1 = 4, S2 = 3 S3 = 2, and N = 1, other than that, the determination of land suitability classes Also Consider carrying capacity of coastal land for aquaculture roommates Refers to Purnomo, 2005.

Scoring method according to land value uses, benefits or functions that can be performed. Then scoring (harkat) of land related to the quality of land. Scoring (dignity) of land is a quantitative value and therefore not measured directly, but determined by means of estimated or interpreted, therefore Scoring (harkat) of land is always associated with a particular use of the land that has a good score for, say agriculture is not by itself has a good score anyway for other uses, such as residential or industrial areas. Conformity assessment can be made absolute or relative. Can also be made based on the circumstances existing land (actual suitability) or based on the state land after a massive revamping held (potential suitability), which makes the characteristics of the land myrtle (very significant) and quite fixed and the results of his lawyer-change can survived for more than 10.

Scoring method is usually shaped land classification system with the structure of land dignity multiple categories, from the highest category to the lowest Generalizations job selection criteria (FAO, 2000)

Table 1. Criteria, Weight, and Class Land Suitability Pond

Criteria Land	Land suitability classes			
	S1	S2	S3	N
soil pH	6,5-7,5	5,5-6,5&7,5-8,0	4,0-5,5&8,0-9,0	>4,0&>4,0&9,0
Distance from the shoreline (m)	3500-1000	1000-2000	2000-4000	>4000
Slope steepness (%)	0-2%	2-3%	3-4%	>4%
soil texture	Sandy clay loam	sandy loam	dusty clay	Clay, sand
Rainfall (mm / yr)	2000-25000	1500-2000	2000-4000	>4000
land cover	Thickets, fields, farms	Fields, gardens	Mangrove, swamp	Very unstable
Distance from the river (m)	0-500	500-1000	1000-2000	>2000
accessibility	Very smooth	Smooth	Quite smoothly	Not smooth

Source: Poernomo (1992), Ilyas et al (1987), Panjara et al (2006^a;2006^b)

Description:

- S1 = High Feasibility
- S2 = Medium Feasibility
- S3 = Low Feasibility
- N = Not feasible

III. Results and Discussion

Tuban is a district in East Java province with an area of 904.70 km² and has a length of coast reached 65 km. Land area Tuban total is 183.994.561 Ha and marine areas covering 22.068 km². Tuban regency region is in the north coast of Java and is located at coordinates 111° 30 ‘- 112° 35’ east longitude and 6° 40’- 7 ° 18’ latitude, (the Department of Fisheries Tuban, 2014).

Palang sub-district has an area of 363.30 ha farms with farmers as much as 619 people. Commodities were cultivated in District Palang mostly vannamei shrimp and some are cultivated in polyculture of milkfish and vannamei shrimp. Most of the farmers during the dry season utilizing as salt ponds and ponds during the rainy season to cultivate milkfish and shrimp. Cultivation techniques used by growers in District Palang mostly using traditional techniques, good for polyculture cropping patterns, as well as to monoculture shrimp or milkfish, whereas semi-intensive technique only slightly and no use of intensive techniques (Department of Fisheries and Marine Tuban , 2014).

Position Location District of Palang Research more details can be seen in Figure 1.

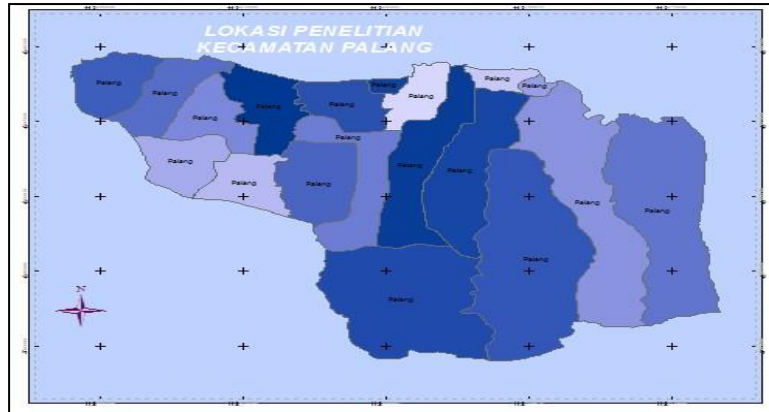
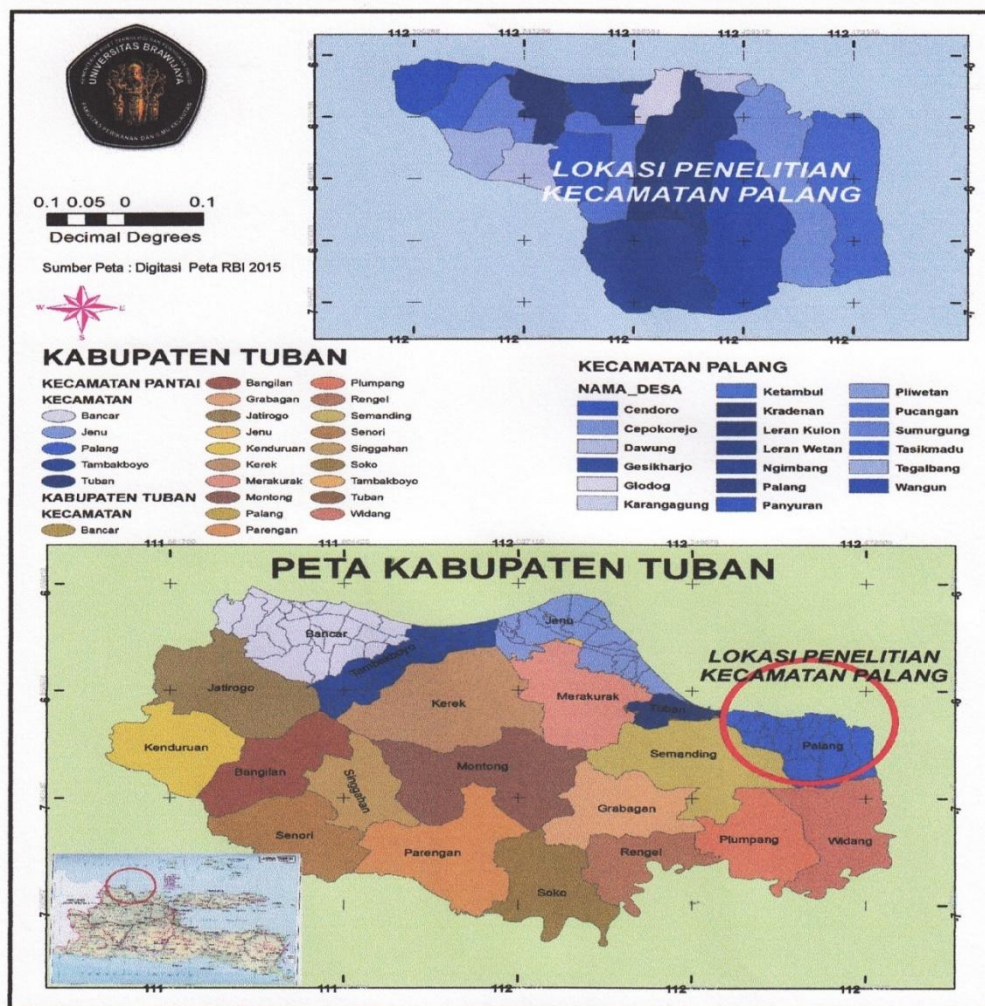


Figure 1. Location District of Palang Research



Source: BAPPEDA Tuban (2015)

Figure 2. Map of Tuban and the District of Palang Research Area

In this study, the results will be known how big the potential of land in coastal areas of the District Palang suitable for use as district vannamei shrimp aquaculture in particular be seen from the parameter suitability of land for farms.

Here is an explanation of land suitability analysis in coastal areas of the District Palang in view of the characteristics of existing land, pH Sediment sampling of soil pH is scattered over several research areas can be seen that the average in coastal areas of the District Palang contains soil pH between 6 , 0 to 6.5, while the detailed distribution of the amount of soil pH.

The amount of soil pH in all districts of coastal areas Palang said almost all of them equally have a pH value of the amount of land that is almost the same between the range of 6.5 to 7.0 and from 6.0 to 6.5, only a small fraction which has a range of values below 5 , from 5 to 6.0. See most of the coastal areas contain a soil pH of 6.5 to 7.0 can be said that the actual coastal areas in District Palang has a good potential to be used as land farms because it is in accordance with predefined criteria (Purnomo, 1992). However, not all districts of coastal areas Palang has eligibility as vannamei shrimp farm land considering there are also some areas that contain soil pH less than 5.5.

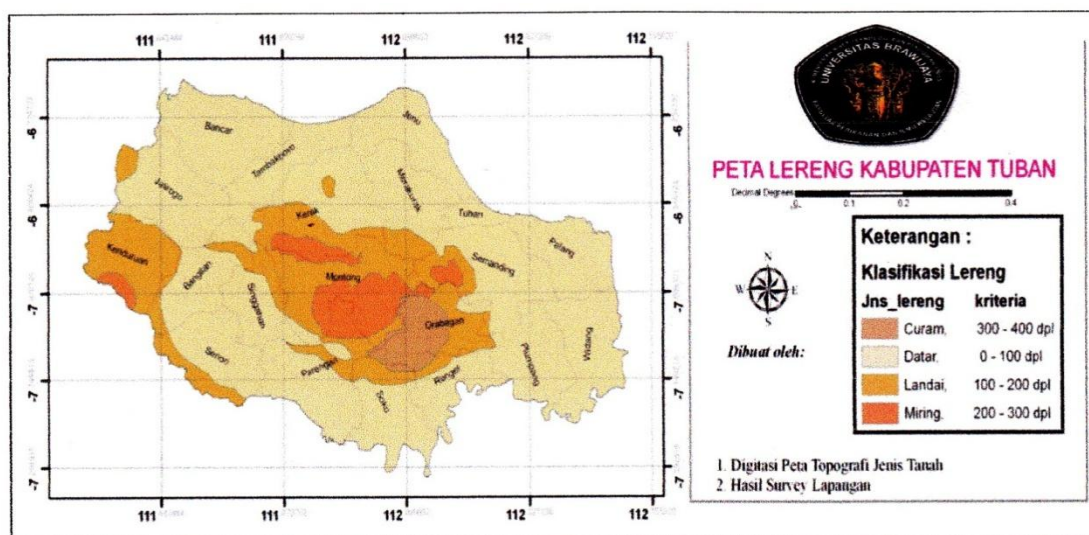
Coastal areas that have great potential to be used as embankment land namely: Pliwetan Village, Village Cepokorejo, Karangagung Village, Village Glodog, Palang Village, Village Gesikharjo, Kradenan Village, Village Tasikmadu, Panyuran Village and Village Leran Kulon.

Based on observations in the field of coastal areas in the District Palang largely untapped optimally it can be seen from land that has been used as a pond land only amounted to 231.40 ha (63.69%) of the total of 363.30 ha. This study used to assess land suitability ponds in coastal areas of the District Palang.

Land suitability maps obtained through methods overlap some thematic map is a map of soil pH, soil texture maps, land use maps, administrative maps, accessibility maps, slope maps, rainfall maps and also maps ponds distance from the shoreline. Based on the eight parameters used in this analysis, each parameter is weighted and balanced. Giving weight of each parameter is based on the importance of a designation of land in this case the suitability of land for farms.

Results of the analysis of land suitability map for ponds in coastal areas Palang districts very appropriate category from the overlay method, the results obtained the highest score overlay covering 231.40 ha (63.69%) and lowest scores measuring 23.9 ha (6.57%).

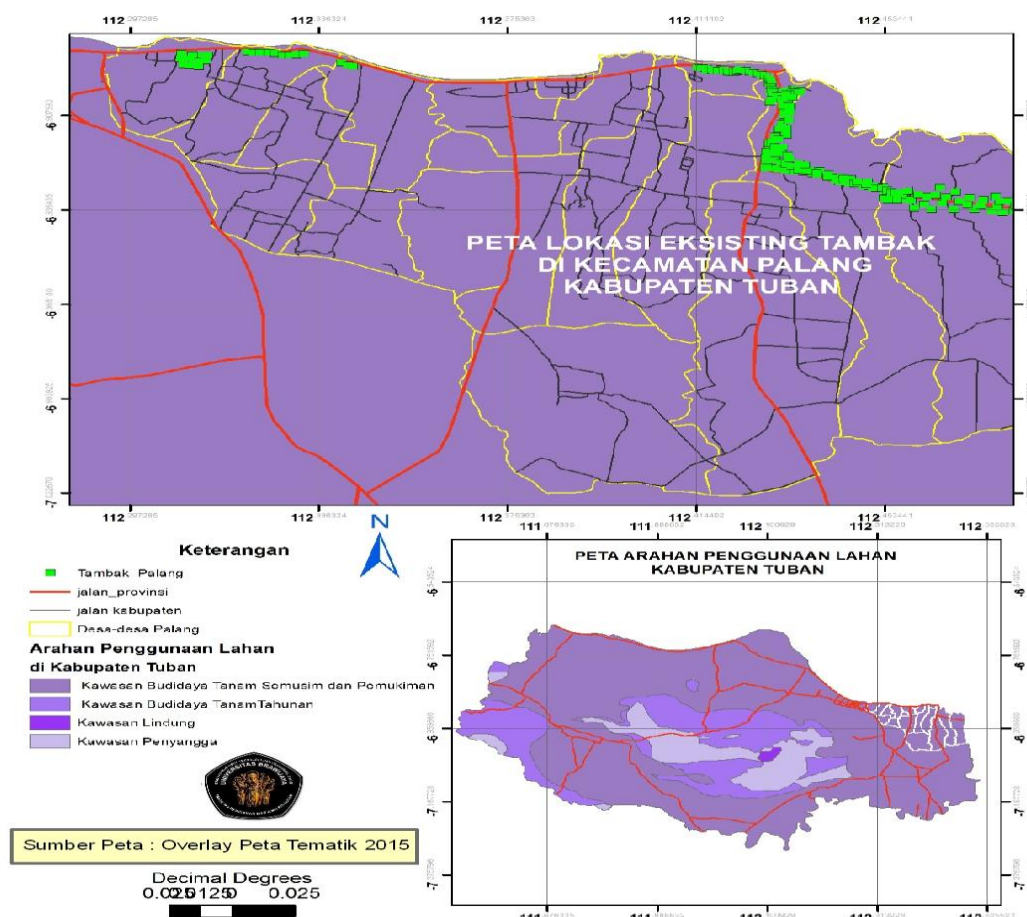
Land suitability analysis on the general slope geological conditions Tuban is divided into four sections, namely Datar (0-100 asl / <8%), ramps (100-200 asl / 8-15%), Italic (200 -300 asl / 15 -25%) and steep (300-400 asl / 25-40%).



Source: Digitizing and Field Survey (2015)

Figure 3. Map of Slope Tuban

Results of the analysis of potential ponds and determination of the location of ponds, ponds potential analysis is intended to provide a picture of the potential of land and land carrying capacity in accordance with available facilities and infrastructure. Results identification of potential land resources ponds based spatial analysis: soil type ponds in coastal areas, especially in the district of Tuban District Palang consist of alluvial and litosol types. Geological conditions/ground in coastal areas Palang districts generally have a slope between 0-2 % which lies between 0-100 asl. From the research for land suitability analysis is based on acquired all coastal villages in the District Palang very appropriate category. Based on the results of the processing of spatial data by using overlay technique storey of 3 thematic maps on the image below:



Source: Spatial Data Processing, 2015

Figure 4. Map Overlay Results Storey Land Suitability (Map Landing Land Use)

IV. Conclusion

From the results of research and discussion on land suitability analysis for strategic planning development of vannamei shrimp farms in coastal areas Palang, it can be concluded that the District Palang coastal areas have land suitability levels ranging from very suitable (S1) of 231.40 ha (63,69%), in line (S2) of 70.40 ha (19.38%), up to quite fit (S3) of 37.60 ha (10.34%).

Areas that have the greatest potential to be developed in part land farms in Pliwetan Village area, Rural Cepokorejo, Karangagung Village, Village Glodog, Palang Village, Village Gesikharjo, Kradenan Village, Village Tasikmadu, Panyuran Village and Village Leran Kulon. Inhibiting factors in coastal areas to serve as the District Palang embankment land include soil texture factor that is sometimes not suitable for aquaculture.

Acknowledgments

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