Implementation Of Land Administration For Aquaculture Management (Case Study: South Coastal Of Sumenep Regency)

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Abstract. Sumenep Regency has a large area of water with enormous fisheries and marine potential. These conditions make the coastal area of Sumenep Regency very potential to be used as aquaculture business land. Aquaculture is a human activity or effort to increase aquatic productivity through aquaculture activities. However, the management of this pond business did not optimal. Many fishpond businesses were running even though they had not yet received permission from the relevant agencies. Therefore, an orderly administration of land is required to resolve these problems. In this research, an inventory of licensed and unlicensed aquaculture businesses, an analysis of the status of the business area and its suitability for the RTRW document, as well as calculation of fees and contributions to the realization of local revenue was carried out. The analysis conducted in this study used the overlay method. The results show that there were 101 unlicensed aquaculture ponds and 6 licensed aquaculture ponds. The results of the calculation of levies from 101 unlicensed ponds in the amount of Rp. 166,082,500.00, included in the fairly good criteria of 36.9%. While permitted farm levies in the amount of Rp. 55,871,000.00 included in the less contribution criteria of 12.4%. The suitability of the unlicensed pond business with the RTRW documents obtained 83.46 Ha was suitable and 106.3 Ha was not suitable and the licensed ponds are 17.2 Ha was suitable while 38.6 Ha was not suitable. The results of this research can be used as an evaluation for granting business licenses and RTRW document enforcement in the field.

Keywords: Aquaculture, Land Administration, RTRW, Sumenep Regency.

1. Introduction

Sumenep Regency is a regency located at the eastern end of Madura Island. Consisting of 126 islands, scattered to form groups of islands both inhabited and uninhabited [1]. Sumenep Regency has a wide area of water, with a beach length of 577.76 km has a very large potential of fisheries and marine fisheries such as capture fisheries, aquaculture, marine tourism, coral reefs and seaweed [2]. Based on the Government Agency Performance Report of Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu (DPMPTSP) of Sumenep Regency in 2018, the revenue from fishery business permit fees of Rp.39,342,756 from the target of Rp.13,501,000 [3]. The retribution revenue has exceeded the target, but it can still be maximized because many aquaculture ponds have not yet obtained business licenses [4]. For example, fish ponds in Desa Gersik Putih, which were forcibly terminated by residents for reclamation [5], shrimp ponds in Desa Pakandangan that thrived although not licensed [6], and shrimp ponds on Poteran Island that were built on land owned by residents and carried out reclamation [9]. Its required an orderly application of land administration to solve these problems. In this research, an analysis was carried out in accordance with the land administration function, which is an inventory of licensed and unlicensed aquaculture businesses, an analysis of the status of business land and its suitability for the Sumenep Regency Regional Spatial Plan, and calculating fees and
contributions to the realization of regional revenue. The purpose of this study is to map the licensed and unlicensed aquaculture businesses in the study area with the overlay method so that they can be used as a reference for the government regarding the withdrawal of fees and consideration for granting business licenses in the coastal area of Sumenep Regency.

2. Methodology

2.1. Study area and data

The research area is in 46 southern coastal villages of Sumenep Regency, which are spread in 6 districts with a total area of 19,606 Ha. Geographically, the area of Sumenep Regency is located between coordinates 113°32'54" - 116°16'48" BT and between 4°55' - 7°24' LS with a northern boundary bordering the Java Sea, to the east bordering the Sea Java and the Flores Sea, to the south is bordered by the Madura Strait and the Bali Sea and to the west is Pamekasan Regency. This area is used as a research location because it represents an area that represents the purpose of this study, namely the visualization of licensed and unlicensed aquaculture businesses. The research location can be seen in figure 1.

The data that used to support this research are, Sumenep Regency RTRW Map for 2013-2033 scale 1:50,000 from BAPPEDA Sumenep Regency, Map of Cultivation Fishery Business Permit from DPMPTSP of Sumenep Regency, Cultivation Fishery Business Permit Retribution from DPMPTSP of Sumenep Regency, Data on the Status of Cultivated Fisheries Business Land Sector from BPN of Sumenep Regency, Orthorectified SPOT 6 Satellite Image of Sumenep Regency in 2018 from BAPPEDA of Sumenep Regency, Administrative Boundaries of BAPPEDA of Sumenep Regency.

2.2 Data Processing

The following is the data processing in this search

Inventory of Aquaculture Business Land. Making a valid land cover map of coastal areas is done by digitizing the SPOT 6 satellite image of Sumenep Regency. After obtaining the land cover map in
In the study area, delineation of the aquaculture pond business was carried out. Furthermore, the topology is carried out on the digitization results. The accuracy test is done by compiling a confusion matrix with an Overall Accuracy value of ≥85%.

Furthermore, the Inventory of Licensed Aquaculture Business data and Fishery business license data obtained from DPMPTSP Sumenep Regency are inventoried according to the study area. In addition, it is plotted to obtain a map of the fishery cultivation business license in the study area. Then the calculation of retribution for pond business without a permit is carried out. Attribute is filled in the form of the amount of levy on licensed ponds. Furthermore, the levies and fees are calculated for unlicensed aquaculture ponds.

Next, make a map of the status of a plot of cultivated fishery business land. For the analysis of the status of the land parcels for aquaculture, land parcels were selected which were obtained from the BPN of Sumenep Regency according to the study area. The coordinate transformation is carried out from TM3 to UTM in order to have the same coordinate system.

Furthermore, the analysis of the suitability of business land with RTRW. The RTRW map cutting is done according to the study area. The result of cutting the RTRW map overlaps with the map of unlicensed cultivation land and licensed aquaculture business map. The overlay results can be used to analyze the suitability of licensed and unlicensed agricultural businesses with the RTRW. Then, the results of data processing are plotted and a layout is made to produce the maps needed to support the analysis.

![Figure 2. Data Processing Flow Chart](image)

### 3. Results and Discussion

#### 3.1 Classification of South Coastal Land Covering of Sumenep Regency

The sampling point was taken to validate the land cover classification resulting from the interpretation of SPOT 6 satellite imagery in Sumenep Regency in 2018 which had been orthorectified. There were 150 sample points, namely 50 sample points on the farm land cover, 40 sample points on the open land cover, 40 sample points on the built land cover, and 20 sample points on the waters.

Then the classification accuracy test was done using the sample points that have been taken.
Accuracy test was done by calculating the error matrix (confusion matrix) with a classification accuracy level of ≥85% [10]. In Table 1 shows the results of the calculation of the classification accuracy test performed.

| Reference Class | Sample Data | Producer’s Accuracy |
|-----------------|-------------|---------------------|
| Pond            | 48          | 98%                 |
| Open Land       | 1           | 97.5%               |
| Built Land      | 0           | 100%                |
| Water           | 1           | 95%                 |
| Number Of Pixels| 50          | 96%                 |

In Table 1 shows the overall accuracy value of 98% which shows that the classification has a high accuracy (accurate). As for the accuracy of kappa, it shows a value of 0.977 which indicates that the classification carried out has a high level of closeness.

The results of land cover classification using satellite imagery obtained 4 classes of land cover in the study area, namely 3,525 Ha (18%) of ponds, 13,770 Ha of open land (70.2%), build land of 1,619 Ha (8.3%), and waters 692 Ha (3.5%).

3.2 Inventory Results of Aquaculture Farming (Land Use)
The aquaculture business inventory was carried out by interpreting satellite imagery using digitization methods and field surveys. The results showed there were 101 ponds consisting of 83 shrimp ponds and 18 milkfish ponds. The distribution of ponds on the southern coast of Sumenep Regency can be seen in Figure 3.

Figure 3. Map of Aquaculture Business in South Coast of Sumenep Regency
3.3 Identification of Aquaculture Business Permits (Land Value)
The results of an inventory of aquaculture business licenses obtained from DPMPTSP Sumenep Regency in 2019 there are 6 licensed ponds located in the study area. Of the 6 ponds, all of them are permits granted for shrimp farming. The results of the farm aquaculture business inventory are explained in the following table 2.

| No. | Farm Owner       | Village          | Land Status | Retribution |
|-----|------------------|------------------|-------------|-------------|
| 1.  | Zainul Qomar (CV)| Andulang         | HGU         | Rp.10,066,000|
| 2.  | Taufiqur Rahman (UD)| Pakandangan Barat| HM         | Rp. 1,370,000|
| 3.  | Hadi Cokro (PT)  | Lapa Daya        | HGU         | Rp. 14,111,000|
| 4.  | Iwan Susanto (PT) | Lapa Daya        | HGU         | Rp. 2,500,000|
| 5.  | Aries Radityo (CV)| Lapa Laok        | HGU         | Rp. 1,977,000|
| 6.  | Rahman Setiyono (UD)| Kertasada       | HM         | Rp. 55,871,000|

a. Unauthorized Cultivation Fisheries Business Retribution
Unlicensed aquaculture business levies is the calculation of levies for aquaculture businesses that have not received a business license from the DPMPTSP. The pond inventory carried out obtained 101 ponds that did not have a business license. Aquaculture ponds on the south coast of Sumenep Regency are dominated by shrimp farmers. The total retribution that can be received by the local government from 101 aquaculture ponds is Rp. 166,082,500. The levy calculation refers to the Regional Regulation of Sumenep Regency No. 8 of 2018 concerning Certain Licensing Levies. All pond aquaculture businesses resulting from the inventory are charged both from shrimp farmers and besides shrimp. Determination of costs for all aquaculture farms is carried out due to limited data to identify businesses. Because of the current conditions that do not allow for the collection of primary data to the field.

b. Licensed Aquaculture Fisheries Business Retribution
Licensed aquaculture business levies are levies paid by aquaculture entrepreneurs to related agencies in accordance with Surat Ketetapan Retribusi Daerah (SKRD). Licensed farm levies data were obtained from DPMPTSP Sumenep Regency. Table 2.6 shows the total levies from 6 licensed ponds amounting to Rp55,871,000. In Figure 4 the following shows the distribution of licensed and unlicensed aquaculture businesses and the amount of their fees. The amount of retribution is divided into 4 classes. The dominant retribution class is class 4, 41 land with a cost of less than Rp. 500,000. While the lowest retribution class is class 1, which is 11 lands with a cost of more than Rp. 5,000,000.
c. Calculation of Contribution Levies and Classification of Contribution Criteria

The total realization of regional original revenue (PAD) DPMPTSP Sumenep Regency in 2018 is Rp. 449,954,408 [3]. Local own revenue (PAD) consists of Building Permit Levy, Disturbance / Crowd License Fee, and Fishery Business Permit Fee. The formula for calculating the contribution of levies is as follows [8]:

\[
\text{Retribution Contribution} = \left( \frac{\text{Retribution Revenue Receipts}}{\text{Realization of Regional Original Revenue}} \right) \times 100\%
\]

| Percentage       | Criteria         |
|------------------|------------------|
| 0.00%-10%        | Very Less        |
| 10.10%-20%       | Less             |
| 20.10%-30%       | Moderate         |
| 30.10%-40%       | Fairly Good      |
| 40.10%-50%       | Good             |
| >50%             | Very Good        |

The results of the calculation of the classification criteria for the contribution of aquaculture fisheries contributions obtained are explained in table 4 below.

| Table 4. Calculation of Contributions Criteria Results |
|----------------------------------------------|------------------|
| Contribution                   | Contribution Criteria |
| Unlicensed Aquaculture Ponds    | 36.9%            | Fairly Good Contribution |
| Licensed Aquaculture Ponds     | 12.4%            | Less Contribution        |
3.4 Land Status of Aquaculture Business (Land Right)

Based on the results of an inventory of farmland land that was overlaid with land status data from the National Land Agency of Sumenep Regency, a total of 6 aquaculture ponds were obtained, consisting of 2 land with ownership rights and 4 land with cultivation rights. The status of business land is detailed in Table 2. Land with ownership status is owned by the company in the form of UD (Commercial Business), while land with business status is owned by the company in the form of CV and / or PT.

Whereas in aquaculture ponds with cultivation without permits, it shows that out of 101 aquaculture businesses, there are 17 land with ownership rights, 12 lease rights, and 72 uncertified lands. Plantation with lease status is a farming business that uses state-owned land (PT Garam). Land for rent at a rate of Rp. 1.650.000,- for land with cultivation other than shrimp and Rp. 3.000.000 for shrimp farming. Figure 5 shows the status of the aquaculture business land on the South coast of Sumenep Regency.

![Figure 5. Land Status of Aquaculture Business](image)

3.5 Conformity of Farming Land Land with RTRW (Land Development)

There are 7 land cover classes in the Sumenep Regency Spatial Plan for 2013-2033 that are used as a reference to analyze the suitability of ponds on the south coast of Sumenep Regency. Land cover classes are 2,606 Ha (13.3%) ponds, 6,889 Ha (35.1%) settlements, 6,767 Ha (34.5%) horticulture, 1,166 Ha agricultural food crops (5.9%), water catchment areas covering 240 hectares (1.2%), production forests covering 43 hectares (0.2%) and coastal borders covering 1,895 hectares (9.7%).

Identification of suitability of the aquaculture business is obtained by patching the cover of existing agricultural land with the pond class in the RTRW. From the results of the analysis conducted, it is known that there are some ponds which are not in accordance with their designation.
in the RTRW. In Figure 6 the following shows the results of an overlay between the farm land cover and the farm land cover on the RTRW.

![Figure 6](image.png)

**Legend**
- Village Administrative Boundaries
- Sub District Administrative Boundaries
- District Administrative Boundaries
- Not Suitable Land
- Water Catchment Area
- Settlement
- Farm Crop Agriculture
- Food Crop Agriculture
- Pond
- Production Forest
- Coastal Zone

**Figure 6** Conformity of Farm Land to RTRW

In Figure 6 shows the results of the suitability between the existing farm land cover with the pond allocation in the RTRW. The figure shows that there are several large pond areas included in other land cover planning. In more detail, the level of discrepancy in agricultural land cover, unlicensed aquaculture ponds and licensed aquaculture ponds with RTRW are listed in table 5.

| Table 5. Conformity of Pond Business Land with RTRW |
|-----------------------------------------------------|
| **Farm Land Cover** | **Licensed Aquaculture Ponds** | **Unlicensed Aquaculture Ponds** |
| Pond (RTRW)          | 2918 Ha                        | 17.2 Ha                        | 82.6 Ha                        |
| Coastal Zone (RTRW)  | 538.4 Ha                      | 36.6 Ha                        | 96.8 Ha                        |
| Reclamation (RTRW)   | 68.6 Ha                       | 2 Ha                           | 9.5 Ha                         |
| Total                | 3605.5 Ha                     | 55.8 Ha                        | 188.9 Ha                       |

Table 5 shows that the size of the pond business at the coastal border and the reclamation area is quite large, both licensed and non-licensed ponds. This shows that the local government must improve its oversight function of ponds in Sumenep Regency.

**4. Conclusion**

1. The results of the pond inventory using SPOT 6 satellite imagery, namely 101 ponds consisting of 83 shrimp ponds and 18 milkfish ponds.
2. There are 6 licensed ponds located in (1) Andulang Village, Gapura Sub-District; (2) Pakandangan Barat Village, Bluto Sub-District; (3) 2 ponds in Lapa Daya Village,
Dungkek Sub-District; (4) Lapa Laok Village, Dungkek Sub-District; and (5) Kertasada Village, Kalianget Sub-District.

3. The results of the calculation of levies from 101 unlicensed ponds in the amount of Rp. 166.082.500.00, included in the fairly good criteria of 36.9%. While permitted farm levies in the amount of Rp. 55.871.000.00 included in the less contribution criteria of 12.4%.

4. The results of the suitability of the ponds business with the RTRW document, that is the area of aquaculture ponds unlicensed covering an area of 82.6 Ha was suitable and 106.3 Ha was not suitable and area of aquaculture ponds licensed covering of 17.2 Ha was suitable and 38, 6 Ha was not suitable.

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