



## 2.2 Research Tools and Materials

The equipment used in this study [2] is intended to facilitate data processing in the laboratory, tools used such as the Global Positioning System RTK (GPS), Echosounder, and portable supporting equipment for measuring water quality. The satellite images used are sentinel satellite images 2A and 2B acquisition August 21, 2020 (<https://scihub.copernicus.eu/>) used to identify seaweed cultivation protected areas; Peta Lingkungan Pantai Indonesia (<https://tanahair.indonesia.go.id/portal-web>).

## 2.3 Data Collection Techniques

The data collection technique [2] in this research is divided into events, namely primary data collection, where the implementation is carried out in the field such as conducting a ground check from the results of the analysis [2]. In addition, there are also secondary data that generally come from local government data related to this study.

## 2.4 Data Analysis Techniques

In this study, the type of data used was data related to seaweed cultivation such as [6]: protection, bottom substrate, temperature, pH, current, depth, MPT, DO, salinity, phosphates and nitrates. Based on these data, interpolation will be made which aims to predicts grid values that are not represented by sample points. The interpolation used is Inverse Distance Weighting (IDW). This method makes the data is weighted during interpolation, so that the influence of one-point relative to other points and decrease as the distance to the grid nodes gets larger [2], [7]. Results from this polygon or coverage (layer) is used for the overlay process. To acquire an arrangement of the equal of agreement, a configuration matrix is made complete scoring and weighting on the preventive parameters of seaweed cultivation actions. In this study, each parameter was divided into three classes, namely unsuitable (N), suitable needs (S2) and suitable (S1) [8]. According to [2], quantitative investigation to control the suitability of Seaweed Cultivation uses the "assessment" method with the following approach [2]:

$$Y = \sum ai . Xn \tag{1}$$

where

- Y : Final value
- ai : Weighing value
- Xn : Value of land suitability level

To find a period of standards in each type is established created on the percentage value of the computation results in Table 1.

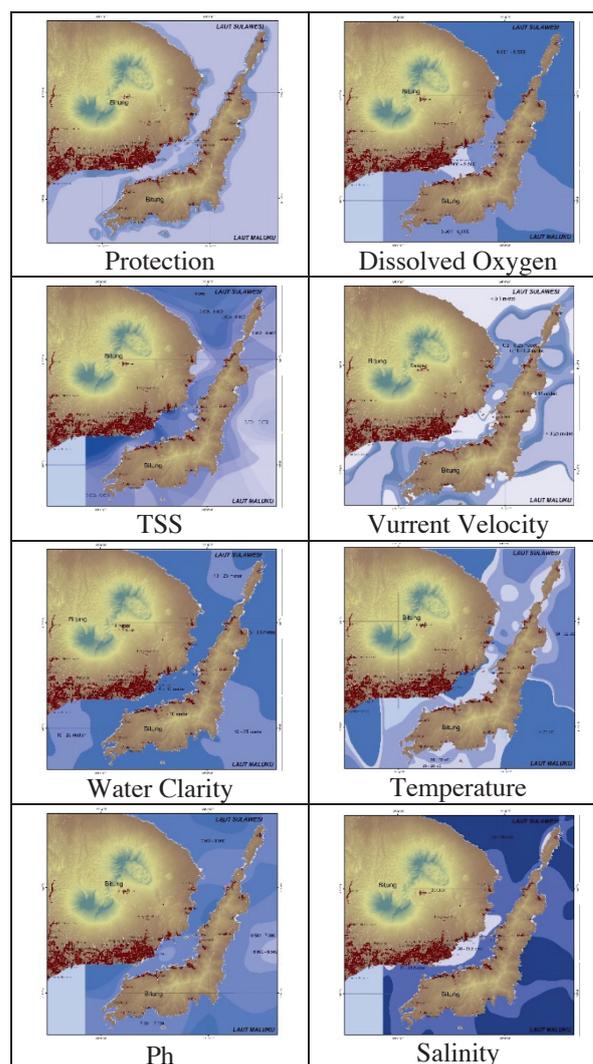
**Table 1.** Total Scoring the suitability Seaweed Cultivation system.

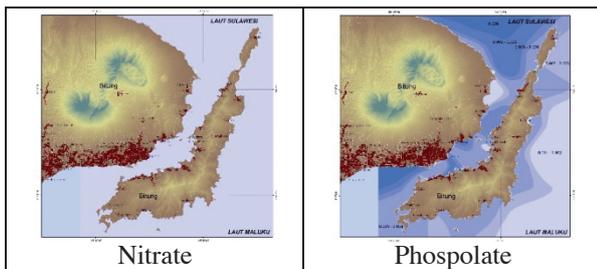
Overall Score	Suitable Quantities	Statements
247 - 255	Suitable (S1)	This field has the possible to be developed for Seaweed Cultivation.
244 - 247	Suitable needs (S2)	This space is quite helpful for developing the Seaweed Cultivation system. Nevertheless, this area has a limiting factor that requires exceptional treatment to improve its capabilities.
241 - 244	Unsuitable (N)	This Geographical zone that are integrated in this classification can't be cultivated for Seaweed.

## 3 Results and Discussion

### 3.1 Parameters Seaweed Cultivation Analysis

The considerations that assistance in the suitability models seaweed cultivation system as pictured in the following maps (Figure 2).

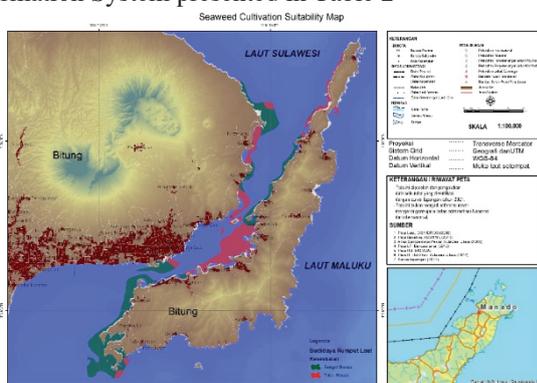




**Fig. 2.** Suitability Parameters Seaweed Cultivation system

### 3.2 Suitable Locations For Seaweed Cultivation

Determination of the location of seaweed cultivation is carried out by overlaying each variable that has been obtained. A map of land suitability is presented in Figure 3. The map is then carried out an analysis of the extent of each suitability using the Geographic Information System presented in Table 2



**Fig. 3.** Seaweed Cultivation Suitability Map

The percentage of suitability of seaweed cultivation in the waters of Lembeh Island and Bitung City has 2 categories. The Unsuitable (N) has a percentage of 41%, and for the Suitable (S1) category (S1), which is the zone that is highly recommended for seaweed cultivation, has a percentage of 59%. This very suitable area percentage is an area that is still relatively safe from sea transportation activities in Bitung City

**Table 2.** Font styles for a reference.

No	Suitable Levels	Area (ha)	Percentage
1	Suitable (S1)	835,58	59%

### 4 Conclusions

The results of this study show that Lembeh Island and its surroundings still have potential in the development of seaweed cultivation of 835.58 ha, even though the water conditions are already very dense by the traffic of industrial ships and transportation, this opportunity needs to be synergized with local government programs in the development of the fisheries industry.

### References

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