INTRODUCTION

Background

Mandeh Bay region is located in the Pesisir Selatan Regency of West Sumatra Province comprised of 9 small islands encompassing marine and coastal areas of approximately 2673.11 Ha. In this area a variety of ecosystem characterized to coastal waters, mangrove, coral reefs, seagrass bed and seaweeds ecosystem can be found. Marine small islands and these natural resources, therefore it is considered that the coastal area of the Mandeh Bay has a great potency of marine and coastal resources, which is an importance aspect for community economic activities.

One of economic activity to be developed in the coastal area is mariculture. The mariculture might be best to developed as an alternative livelihood in order to increase the income and welfare of local community. There are several reasons of the importance to develop accordingly the mariculture (1) production of capture fisheries in Indonesian water, including West Sumatra Province, are decreasing, on the other hand the market demands are increasing (Rusman, 2003), and (2) Mandeh Bay with area of approximately 2673.11 Ha provide a promising site for mariculture development especially by mean of Floating Nets Cage (FNC). According to Rusman (2003), (1) this culture of grouper is very efficient in using area (water) as location of the culture where its productivity level is higher, (2) business unit could be agreed with cost, (3) easy to control, and (4) efficient in using times and manpower.

Based on the above considerations the attempt to develop the grouper culture may be resulted a significant impact for increasing fishery productions, local community income as well as to fill the need of highly protein content nutrition. Considering that coastal water is very susceptible against various impacts that resulted from economic activities and changing environment conditions, developing grouper culture activity in the bay should be planned comprehensively and accurately so that this grouper culture could be sustainably managed.

For developing the grouper culture in the FNC, two of importance activities that need to be planned are selecting and determining a location of the culture, as these two activities are the key factors for the success of grouper culture. An suitable location, beside it caused bad environment quality, it also caused of
failure in production process. Based on a Presidential Decree No. 23/1982 about developing mariculture in Indonesia water, selecting and determining part of waters that would become as location of mariculture, the location should fulfill requirements of technique, and considering importance of other sectors. Then, based on an Agriculture Minister Decree No. 473/Kpts/Um/7/1982 about implementation guideline of the Presidential Decree, the technique requirements one of them is waters suitability biophysically for necessity of culture.

Referred on the Presidential Decree No. 23/1982 and its implementation guideline, it is importance to know the characteristic of selected sites biophysically in order to find a suitable location for developing the grouper culture. Accordingly, for supporting the plan of development, data and information of above aspects should be analyzed to get suitable location for culturing the grouper.

**Formulation of Problems**

By a Decree of the Government of Pesisir Selatan Regency No.5/2001, March 31, 2001, regarding Marine and Fishery Sector, the coastal area of Mandeh Bay is part of Development Area-IV (DA-IV). This is based on a consideration that this area is highly potencies in resources that could be utilized to develop various community economic activities, including mariculture.

One of mariculture activities that have been developed by local government is tiger grouper (*Lepisosteus fuscoguttatus*) culture using Floating Nets Cage (FNC) technique. The background of developing the culture activity are (1) the bay has potencies to develop the activity; (2) the grouper is the region’s superior commodity in sub sector of culture fishery because of its high economic value in the market; and (3) it is hoped that this activity could increase the economic development in region.

In 2003 and 2004, the local government has initiated to develop an intensive the grouper culture up to 10 units FNC (30 cages) located in water of Mandeh Village. In 2006, the FNC will be increased to 20 units FNC (60 cages) at the same location, funded by the Marine and Coastal Resources Management Project (MCRMP) of 2006 (DKP- Pesisir Selatan Regency, 2006).

Selection and determination of the location for the grouper culture have been carried out by the local government together with local communities solely based on physical factors i.e. protection from waves, currents, and wind. However such three
Factors may be insufficient to be used in site determination for the mariculture. This could give impact to (1) lower growth rate of the grouper because characteristics of the part of waters are unsuitable yet with requirements of water characteristics for growth the grouper, and (2) the local government has difficulties to develop the appropriate suitable culture’s location due to insufficient information of biophysical parameter of water.

According to “DKP of Pesisir Selatan Regency” (2006) total of grouper production in 2004 and 2005, were approximately 288 kg (2 units with 6 cages) in 2004, and 1152 kg (8 units with 18 cages) in 2005, where average of their growth rate approximately 54 gram/individual/month. This growth rate is lower than growth rate of grouper that has been ever carried out by “Balai Budidaya Laut Lampung” in 1985 in the five provinces (Riau, East Java, Bali, North Sulawesi, and Ambon). In these provinces, the growth rate of tiger grouper (Epinephelus fuscoguttatus) was 75 – 100 gram/individual/month. However, this growth rate could still be increased again using good management especially for water quality, beside for production factors such as feeds, and seeds (Adji et al., 1998).

The lower growth rate of grouper in the bay is presumed caused by water condition is unsuitable for growing the grouper. The existence of water characteristic is influenced by various community economic activities surrounding areas where these activities could result negative impacts for the waters. It has long been known that the Mandeh Bay is not only utilized for the grouper culture but also utilized other activities such as capture fisheries (lift nets), transportation, and coastal tourism (Cubadak Island). It is predicted, that highest activities level is not only eliciting conflict interest among users or stakeholders, and decreasing water characteristics quality, but also degradation of resources ecosystem.

Based on the above descriptions, problems in this research are identified as follow (1) biophysical characteristics of the bay waters are not well known, and (2) biophysical suitability of the bay water is not known yet.

Objectives of Research

The objectives of this research are (1) to analyze biophysical characteristics of water of the Mandeh Bay, (2) to evaluate biophysical suitability of water for culturing the tiger grouper (Epinephelus fuscoguttatus).
Benefits of Research

To provide information at which part of the Mandeh Bay that is the development need of the grouper culture with Floating Nets Cage (FNC) technique.

Scopes of Activities

Boundary of study area

Study area of “Analysis of Suitability of Mandeh Bay for Developing Grouper Culture in Floating Nets Cage (FNC) in Pesisir Selatan Regency, West Sumatra Province” is in water of Mandeh Bay; they are water surrounding Mandeh Village, and Simpang Carocok Village. This area is in Sub District of Koto XI Tarusan, Pesisir Selatan Regency-West Sumatra Province.

Activities

The activities that were carried out are:

1) Analysis of biophysical characteristics of water based on the parameters of chlorophyll-a, pH, salinity, Dissolved Oxygen, Biochemical Oxygen Demand/BODs), depth, wind, current, wave, temperature, transparency, turbidity, and Total Suspended Solid/TSS).

2) Evaluation of biophysical suitability of water for culturing the tiger grouper (Epinephelus fuscoguttatus).