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Production of Communal Pond at Coast of Southeast Sulawesi Indonesia

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Abstract: This study would like to investigate the dominant factors that influence the production of communal pond at coast of Southeast Sulawesi. The data were collected through interview, questionnaire, discussion, field note and documentation. The subjects involved were farmers. Furthermore, the data were obtained by using Cobb Douglass analysis. The study shows that dominant factors that influence the production of coast are land area, capital and labor. This article discusses the aquaculture problems and coast area of Southeast Sulawesi. Furthermore, this study investigate several factors that influence the production of pond in Southeast Sulawesi.

Key word: Production pond and coastal areas, furthermore, Southeast, douglass, Sulawesi

INTRODUCTION

In Indonesia, the potential of pond land areas is 2.96 mln. ha while the potential of sea areas is 2.55 mln. ha. However, the huge potential of those areas has been utilized are approximately 4.68%. The potential of pond area has been utilized is only 682.726 ha or 23.04% of available land. Based on the data of Maritime and Fisheries Affairs Department, the potential of pond conservation area in Southeast Sulawesi is 58.930 ha. In 2014, the potential of this area was only utilized 27.03%.

Commonly, the production of pond conservation in Southeast Sulawesi which consists of shrimp and milkfish was registered 36.255 tons in 2013. This number increased 44.832 tons or 23.66% in 2014. The production can be increased due to non-optimal use of pond area in Southeast Sulawesi (Eldani and Primavera, 1981).

Based on the data, the attempt to increase production of the pond is considered as potential resources. The development of pond production, especially milkfish and shrimp is intended to meet both local and regional needs. Furthermore, it can be expanded across countries which lead to the change of communal standard living.

Beside the development of communal income, the production of pond conservation has the critical strategies as mentioned as follows: first, the production of fish pond is particular commodity which has selling point in both regional and international market. The income of this production is used to increase foreign exchange and infrastructure as well. Second, the production of pond conservation means raw material aims to meet various agro-industrial needs and to create job vacancies for community (Bailey, 1998)

Literature review: Heightened competition aquaculture in some countries proves that the potential advantage that a very large aquaculture. However, problems often faced by fish farmers is still limited land in developing aquaculture (Nhan *et al*., 2007). Results of a study conducted by Romero *et al*. (2014) who studied the optimization of the size of the shrimp farm intensive system. The study also found that the land area greatly affect the productivity of shrimp pond production. The same study also conducted by Sarkar *et al*. (2015) in India found that, the area is positively and significantly affect the productivity of the farm. Instead the results (Iinuma *et al*., 1999) revealed the land area is not a problem in the production o f the pond, it is visible in the resulting efficiency intensive pattern. There are limitations to make the land more fish farmers often use semi-intensive pattern by combining the cultivation of milkfish and shrimp in a pond (Eldani). Results of research (Wohlfarth *et al*., 1985) revealed that the combination is not a negative effect on each other.

In realizing increased production ponds, land management factor is very important regarding the determination of ponds (Singh, 2007). In addition, factors of capital, labor has a role in increasing the productivity of ponds (Abbas and Ukoje, 2009; Bhattacharya, 2009; Belton and Azad, 2012; Blythe *et al*., 2015). The role of capital is certainly faced with the risk of increased

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productivity in aquaculture (Chowdhury and Khairun, 2014). Capital factor in this regard relates to how the use of the cost incurred in the production process that includes, fixed costs and variable costs of production ponds (Mekhora and Cann, 2003). Furthermore, the role of frequency of water changes cannot be separated in an increase in production (Mahmud and Pandjaitan, 2007). Water exchange in the ponds functioning in oxygen levels necessary requirements (Fernandez and Osuna, 2004). However, it should be noted also related to water conditions outside the pond because of conditions beyond the pond water can affect the health of the colony of ponds (Burford *et al*., 2003). Research related to the frequency of water changes is also done by Devi and Prasad (2006) which revealed that the change of water can increase shrimp production in semi-intensive systems. In addition to some of the above factors must be supported by the use of good technology (Moss *et al*., 2012) also add to the technology as a factor affecting the productivity of the farm. Besides being able to increase production ponds, the technology can also help in overcoming the problem of ecosystem damage, water pollution, the spread of disease, contamination of sediment (Anh *et al*., 2010).

The analysis of production and resource use in pond is at the core of marine fishery policies which seek to increase domestic production by ensuring optimal resource utilization. Increased pond productivity is one of the prerequisites of economic progress (Ogunfowora and Essang, 1974). The issue of determining the pattern and the efficiency of resource use in pond in coastal arises in the context of formulating development strategies designed not only to raise the productivity of resources already committed to pond farming but also to ensure that the newly created resources in the marine fishery development efforts are allocated to areas and/or enterprises in which their productivities are higher (Awoyemi *et al*., 2003).

Production function is a technical relationship that links between factors of production or also called input or inputs and products or product (output). Particularly, the analysis of relation between production and its factors to determine independent variable is based on the purpose and condition of farm (Kim *et al*., 1988). The purpose of production can be transformed from linear to logarithm models. Thus, the calculation and coefficient of production factors will be easier to measure them.

MATERIALS AND METHODS

The data were collected by applying direct interview, questionnaire, open discussion, field note and documentation. The data distribution and collection are directly conducted by the writer. This study applied Cobb Douglass analysis in order to investigate dominant factors that influence the production of pond (Meeusen and van den Broeck, 1977).

RESULTS AND DISCUSSION

It is important to make modification by designing particular linear model. One way to transform non-linear into linear model by generating its model becomes logarithm model. Furthermore, it is crucial to conduct classical assumption trial before statistical analysis and hypothesis. Therefore, there are 3 tests conducted in this model, those are) multi co-linear test used to ensure the relation among independent variables) heteroscedasticity test used to investigate the constant of term errors and correlation serial test used to investigate the relation among term errors to each period.

Based on multi co-linear test, the problems were not found in this model. In fact, heteroscedasticity test stated that the used model is passed the test of heteroscedasticity problems. Moreover, the serial correlation test showed that the used model is passed the test of serial correlation problems.

The contribution of the variables towards quality shift of pond production is 44.78%; the rest is 55.22% determined by other variables beyond the model. This fact showed that the contribution of production quality shift is not only determined by surface area, capital, labor and water shift frequency but also determined by other variables of this model. There are other variables that influence the production qualities such as seed quality used (Teshima *et al*., 1984; Cordova *et al*., 1998; Bombeo, 1988; Casillas-Hernandez *et al*., 2007; Sookying and Davis, 2011) vitamin, etc.

Regarding the contribution quality of surface area, capital and labor, the low relative production of other variables is not discussed in this model. However, this quality is considered as moderate model to discuss about production shift caused by surface area, labor, capital and water shift frequency. Moreover, the model is supported by classical assumption test.

Partially, the surface area factor significantly influences the quality shift of pond production. It proved by t-statistic value is 1.91 larger than t-critical value towards α 10% is 1.28 or $p = 0.0589$ smaller than α 10%.

Regarding the coefficient line of regression, the coefficient value is considered as positive. This condition showed that the wider pond area, the greater its production and the smaller pond area, the narrower its production. Theoretically, the surface area is a crucial factor for production to determine pond production. According to and the surface area significantly influenced the productivity of pond conservation (Romero *et al*., 2014; Sarkar *et al*., 2015). Thus, the analysis model used in this study is polynomial regression equality.

Those findings highly support the production theories concerning the land area is a crucial factor for production apart from capital, labor, resource and raw material factors (Rebeccaand and Confred, 2016). Apart from those variables, another variable which significantly influences the production quality of pond is capital. It proved by statistic value is 3.145 greater than t-critical of α 10, 5 and 1% which is 1.29, 1.64 and 2.3, respectively. It also can be observed through probability value is 0.0021 smaller than alfa value 10, 5 and 1%. The coefficient line of regression showed that positive effect which means the greater pond capital, the greater its production as well. The huge effect is 17.5%. This number means that every 1% escalation of pond capital, its production will increase 17.5%. Theoretically, it could happen due to the capital is a determiner factor of production, especially pond conservation (Romero *et al*., 2014; Sarkar *et al*., 2015).

Apart from two variables above, the other variable also significantly influences the production quality of pond conservation is labor. In this study, the labor is produced by of cost issued for labor salary affairs (Asa and Solomon, 2015).

Based on estimation, the value of t-statistic is 3.28 greater than t-critical is 1.64 towards α 5% or probability value is 0.0205 smaller than α 5%. The relation for coefficient line of positive regression is 0.158. It means that every 1% escalation of labor salary will increase the production quality is 15.28%. This finding is corresponding with shift patterns of production quality caused by labor salary policy.

CONCLUSION

The dominant factors that influenced the production of pond at coast of Southeast Sulawesi are surface area, capital and labor. The policy to increase the production of pond is considered as a relevant strategy due to the utilized land area is just 27.03% of the available space. Furthermore, there should be government law to provide funding for pond farmer in order to ease capital resources from bank or other fund foundations.

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