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Coastal Village Empowerment Model for the Fishermen Economic Strength in Pasuruan

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ABSTRACT

Pasuruan is one of the coastal areas in East Java Province, where having the biggest problem in mangrove habitat damages. The damages are mostly caused by land clearing for settlements, industrial locations, fish-farming, and others which indirectly impact on the decrease of fishery sectors products. This study aims to model the business diversification of coastal communities in Pasuruan from fisheries, animal husbandry, to coastal environment exploitation to create competitiveness and integration from local to regional, national, and global economic systems. The population was 75 fishermen from the area of Kraton, Lekok, and Nguling Pasuruan. The sampling used cluster purposive sampling by employing primary data and secondary data. Model testing used Partial Least Square (PLS) 1.0. The results indicated that the level of community welfare and sustainability of coastal environment was largely determined by fishing, livestock, and environmental exploitation. In addition, the follow-up analysis indicated that only environment exploitation affected welfare, while coastal environmental sustainability was influenced by fishing, livestock business, environmental exploitation, and community welfare. In conclusion, coastal resources was not optimally utilized. Therefore, diversification model was possibly implemented as an alternative management of the coastal area of Pasuruan.

Keywords: Coastal communities, Business diversification, Management of the coastal area, Environmental exploitation, Sustainability

Introduction

The coastal area is one of the areas that has considerable potential in regional development because of its natural richness, both for renewable and non-renewable resources. In addition, this area also has excellent accessibility for various economic activities, such as transportation, ports, industry, settlements and tourism. 17 of 38 regencies of East Java Province are located in coastal areas due to having nearly four times bigger marine areas compare to its land. It has coastline of approximately 2,916 km with geographical potential to support the sea transportation.

Pasuruan is one of the strategic coastal areas on the North Coast route because it is located on the coastline of + 5 km with 7 villages that are directly adjacent to the sea, so it has high potential for large and diverse fish and marine products and opens more business opportunities. Pasuruan has 3,130 fishery households or approximately 5% of the total population are fishermen and fish farmers with marine fish production of 938,467 tons. However, most of fishermen sell their catches to limited local market. In Indonesia, the fishing community is a group of people who are considered as absolute poor or worse it is the poorest among other poors.

Income in fisheries sector is an economic activity in catching and collecting animals or aquatic plants living in the sea or public waters. (Adili and Antonia, 2017) mentioned that fishery activities contributed higher on family income than other activities with indicators used including: work length,

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working hours, the role of family members, capital, market, technology. As supported by another research (Bravo-Olivas et al, 2015), it mentioned that to understand socio-economic components in sustainable fishery, there were several approaches considered to develop or make policies in fishery management as it affected many living aspects of.

Livestock is another activity of the coastal community in their spare time and involves all family members to do it. Although it is not main activity, livestock business contributes in increasing family income. Nurtini et al (2017) argued that livestock added adequate amount on family income. According to Tijjani et al (2012), farmers should create agricultural cooperative groups to help them get loan from government and financial institutions as well as to get proper counseling especially to implement appropriate technology for the better results.

Coastal communities, especially fishermen, mostly are incapable to utilize resources optimally due to limited knowledge and technology. Therefore, fishermen in every coastal area have different ways to utilize their resources, so the damages in coastal environment become common cases. According to Karnad (2014) many fishermen rarely complied with regulations. Thus, it led to change in fishing practices. He argued that it is necessary to strengthen local fishing communities by enforcing local fishing regulations to protect the fisheries sustainability. Agardy (2000) stated that better information about the impact of fishery activities on ecosystem was highly needed.

Recognizing various potential of coastal area and diverse behavior of fishermen are necessary to diversify business by utilizing coastal resources, so it can optimally be carried out to improve welfare and environmental sustainability. Therefore, improving living quality of fishermen was possibly carried out by considering the sustainability of the use of coastal resources by employing proper technologies and referring economic, ecological, and socio-cultural content. As mentioned by Ali et al (2017), most fishing families depended on fishing as their income source; so government should perform effective fisheries management to reduce overfishing activity in the sea.

This research aims to model the business diversification on coastal community in Pasuruan especially in the area of fishery, livestock, and coastal environmental exploitation to develop competitiveness and integration from local to regional, national, and global economic system.

Materials and Methods

Population was citizens at 3 villages (Lekok, Nguling, and Kraton) in Pasuruan. Sampling technique was cluster purposive sampling by selecting one or several groups purposively. Respondent were 75 people from selected population. A Partial Least Square (PLS) 1.0 was used as analysis technique.

Results

Convergent validity was assessed from the developed measurement model in the study by determining whether each indicator was validly estimated to measure the tested dimensions and concepts. An indicator shows significant convergent validity if the indicator variable coefisien is twice the standard error.

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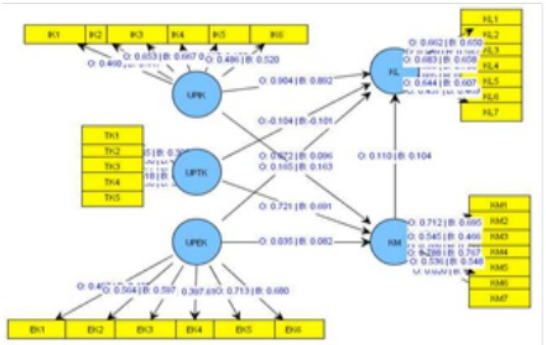

Fig 1. Measurement Model

The data presented shows that all indicators produced estimated values with a critical ratio higher than twice the standard error, meaning that the indicator variables used were valid.

Table 1. Composite Reliability

	Composite Reliability
Business Income (BI)_Fishery	0.787
BI_Livestock	0.711
BI_Environmental exploitation	0.778
Community welfare	0.812
Sustainability of coastal area	0.798

Table 1 shows that all variables have Composite Reliability higher than 0.70 (>0.70), so all variables met the standard of reliability test and considered good.

Table 2. R-square

	R-square
BI_Fishery	
BI_Livestock	
BI_Environmental exploitation	
Community welfare	0.907
Sustainability of coastal area	0.711

Table 2 shows that research model has R-square as 0.907 meaning that variables of fishery, livestock, and environmental exploitation business income were possibly to determine the variables of community welfare as 0.907 where the remaining 0.093 was influenced by other variables. R-square 0.711 indicated that variables of fishery, livestock, and environmental exploitation business income were possibly to determine the variables of sustainability of coastal area as 0.711 where the remaining 0.289 was influenced by other variables.

To examine the relationship among constructs, a bootstrapping procedure was conducted (see Fig. 2). Variables consider as having effect, if the t-statistic is higher than the t-table, with a significant value of 5% = 1.96.

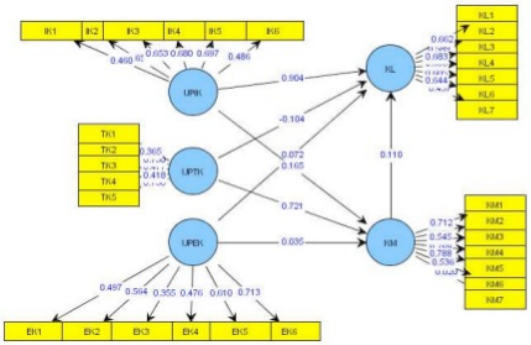

Fig 2. Output bootstrapping Model Strutural PLS 1.0

Table 3. Hypotheses Test

Relationship among Variables	Original samples	mean of subsamples	Standard deviation	t-statistic
BI_Fishery → KM_Coastal	0.165	0.163	0.076	2.190
BI_Livestock → KM_Coastal	0.721	0.691	0.127	5.669
BI_Exploitation → KM_Coastal	0.035	0.082	0.127	0.278
BI_Fishery → KL- Coastal	0.904	0.892	0.029	30.924
BI_Livestock → KL-Coastal	-0.104	-0.101	0.071	1.466
PU_Exploitation → KL-Coastal	0.072	0.096	0.048	1.503
KM_Coastal → KL-Coastal	0.110	0.104	0.052	2.131

Table 3 shows the hypotheses as follow:

- H1: fishery business income has significant influence to community welfare of coastal area.
- H2: livestock business income has significant influence to community welfare of coastal area.

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- H3: environmental exploitation business income has no significant influence to community welfare of coastal area.
- H4: fishery business income has significant influence to environmental sustainability of coastal area.
- H5: livestock business income has no significant influence to environmental sustainability of coastal area.
- H6: environmental exploitation business income has no significant influence to environmental sustainability of coastal area.
- H7: community welfare has significant influence to environmental sustainability of coastal area.

The result shows that almost all variables have significant influence. However, environmental exploitation business income to community welfare, livestock business income to environmental sustainability of coastal area, and environmental exploitation business income to environmental sustainability of coastal area shows no significant influence.

Discussion and Conclusion

The results showed that there was a relationship among the variables of fisheries business income, livestock business income, environment exploitation business income to the community welfare in coastal area in Pasuruan.

The data were analyzed using the Partial Least Square (PLS) 1.0 to measure the constructs of fisheries business consisting of five indicators namely: work length, working hours, the role of family members, capital, market, and technology. The result showed that all indicator met the standard reference of dimension which possibly measured the fisheries business income variable. These indicators explain the phenomena associated with fishing activities of fishermen community in coastal area.

The results showed that most of the respondents were averagely 40 years old, meaning that those were on the peak of productive age with a fairly experiences from 6 to 7 years and mostly graduated from elementary (>50%) to senior high school. One of the constraints found was low education, as factor resulting in the ability to follow the fishing technology development, especially with no support on training or technical guidance. This condition was also exacerbated by their status as freelancer fishermen, so technology mastery becomes far from well-developed. Family has very important role with the involvement of all grown up members (young-adult) whether from main members or relatives who live together.

The lack of modern fishing equipment and technology mastery became major obstacles resulting on the appalling conditions. Although much assistance has been given, there is still no significant change to the fishermen condition in coastal area. In addition, the assistances given missed the target, such as by providing fishing equipment which was not suitable for the condition of sea waters, so it became meaningless. The gap in fishery business capital caused the limited business productivity. To overcome it, capital breakthroughs are necessary to find breakthroughs in order to improve production. Without appropriate capital, it was not possible to increase the production as there was no adequate equipment to support.

Although fishery businesses in the coastal area of Pasuruan are in marginal condition, they are still promising or statistically feasible. However, there were indicators should be well considered. If these indicators were increased, it will allow fishery business significantly contribute to

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income of coastal communities and it results the freelance-fishermen becoming fulltime fishermen. According to Henson (2012) and Sofia (2017), the level of education as well as access to credit and membership in associations were key factors to explain income diversification behavior among fishermen. In addition, Adili and Antonia (2017) mentioned that fisheries contributed to higher household income compared to other activities. While Mohammad et al (2011) as well as Bravo-Olivas et al (2015) found that fisheries contributed largely on entrepreneurship to household income.

Livestock businesses performed by coastal communities are a side business after fishing activities by raising livestock. The livestock raised were cows, chicken, goats, and ducks. This was only side activity with less attention and became a saving for emergency need.

Livestock business has a significant relationship to community welfare. In this variable, capital indicators have less powerful influence illustrating that livestock business in the coastal area of Pasuruan has not been properly implemented, so the results are not optimal. However, these livestock businesses have good prospects. Despite only determined by indicators of the type of livestock, the number of livestock, technology implemented, the role of the family, and insufficient capital support, it contributes on the family income of coastal communities. In this research, livestock business income variable has no significant influence to environmental sustainability. It was caused by how livestock was farmed which was mostly released (un-caged), so indirectly it affected environment (by wasting in the coastal area). According to Yusuf et al (2016), livestock business income indicators affect the livestock business. In addition, Nurtini et al (2017); Nur Aida (2015); and Tijjani et al (2012) argued that livestock contributes greatly to household income.

Coastal environment exploitation is an activity that is usually carried out by coastal communities in the midst of other activities. Activities such as taking marine corals for construction materials, making salt, and chopping firewood are carried out by coastal communities to add family income. Environmental exploitation variables are measured by indicators such as the type of material, availability of materials, regulations, capital and family roles. The types of exploitation materials were commonly marine corals, mangrove woods, and crystallized salt. The business activities of exploiting coastal resources are vulnerable to environmental damage, but obeying government restrictions (regulations) can significantly reduce the damage. Most important by growing awareness on environmental sustainability, the environmental sustainability will be successfully maintained.

Exploitation variable to environmental sustainability has no significant influence because according to the field observation, many people chopping or collecting wood from mangrove forests caused damage to mangrove forests. Thus, it led to flooding when high tides. The exploitation variable to community welfare has also no significant influence because salt farmers or salt miners do not have maximum results as it was seasonal business. Besides, coral mining was also seasonal and it caused no increase in fishermen income, meaning that it do not increase their welfare.

Considering the potential of coastal environmental resources that are very likely to be developed, it is highly possible to successfully carry out future business as long as all factors determined such as business capital, market, and assistance are carried out

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in a targeted manner and it can be another source of family income. Fu et al (2015) and Lan et al (2017) mentioned that knowledge of the relative influence of exploitation and environmental stresses on dynamics in exploited ecosystems will assist in developing an ecosystem-based approach of fishery management.

Fishermen's welfare is largely determined by various factors. Indicators of welfare were the level of health, education, labor, mortality and fertility, housing and household consumption expenditure. The analysis showed that income, consumption, education, home, health, and labor absorption showed a significant relationship, except education indicator which showed no significant. Therefore, Amos considered education as not part of the constructs of welfare. The income of coastal communities from fishery, livestock, and environmental exploitation contributed sufficiently to the income of coastal communities, yet livestock contributed more to the income than other sources. According to Primyastanto (2015); Ali et al (2017); and Nazir et al (2018) most of fisherman families depended only on fishing for their livelihoods, so government should carefully conduct effective fishery management to reduce the overfishing in the sea. In addition, Bravo-Olivas et al (2015) and Rafiy et al (2015) argued that the better the empowerment model was designed, the better productivity was resulted as well as the higher the income was earned.

Statistically, the relationship among variables of fisheries business, livestock business, environmental exploitation business and the community welfare to the environmental sustainability of the coastal area showed various influences. Community welfare variable had significant influence to the environmental sustainability variable. The environmental sustainability variable referred to community knowledge, community attitudes, community behavior, and the role of traditional leaders in maintaining the resource sustainability to avoid destructive methods of exploitation. The attitude shown by coastal communities generally objected the destructive ways in coastal environment management, for example by disagreeing in using bomb and agreeing to preserve coastal forests. These attitudes were positive that is from awareness on the coastal environment existence.

A behaviour in avoiding using bomb to fish showed by there was case absence recorded by the police. This was a manifestation of their compliance with the collective agreement. The role of community leaders and religious leaders was very insignificant due to the development of knowledge, attitudes and behavior of the community was a unity of attitude which is a combination of cognitive, affective and conasi (hereinafter was called as the community attitude to the environmental sustainability occuring without coercion, pressure, and persuasion from anyone but self-awareness). Karnad et al (2014) mentioned that in the increasing process of knowledge, attitudes, and skills, it was suggested that fishermen to understand how to plant mangroves from planting, maintaining and utilizing mangroves. In addition, Agardy (2000) and Edvardsson et al (2011) argued that better information about the impact of the fishery activities to ecosystem was needed. Understanding risks of policy, management, and control identified by fishermen in operating under the ITQ system was more important than those involved in the TAE system.

The analysis showed that business diversification (fishery business, livestock business, and environmental exploitation business) had different influences on the level of community welfare and the environmental

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sustainability in the coastal area of Pasuruan. From the results, developing model for diversification of coastal communities based on fisheries, livestock, and environmental exploitation were formulated to improve the welfare and to preserve the environment. The model of coastal resource utilization in Pasuruan was simple, meaning that not all available potentials were optimally used; utilization was still traditionally carried out, so it is less meaningful to the welfare of coastal communities and environmental preservation.

Formulating policies concerning the sustainable of coastal and marine should involve coastal communities, so the responsibility becomes a collective responsibility based on local wisdom. Businesses developed in the coastal areas of Pasuruan should be cansidered to the research results, for examples fishery business, livestock business, and other environmental services such as salt manufacture and wood charcoal. Judging from the potential exist, it is highly possible that those businesses are capable to improve community welfare. The most important part is the effort and seriousness in improving all components affected (such as in fishery, livestock, and exploitation), so it can guarantee the future welfare. Education and training are less sufficient, but technology development and guarantees of catch market become other important factors to be considered.

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