International Journal of Economic Research

ISSN : 0972-9380

available at http: www. serialsjournal. com

Volume 14 • Number 8 • 2017

The Social Economy Beneficiary From Local Wisdom Strategic in Sustainable Management of Coastal Area in Indonesia

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Abstract: The aims of this research are: to identify the forms of local wisdom that used for managing coastal area at Langkat Regency, to analyze the relationship and or the effect of social economy condition and social culture of coastal community in order to taking benefit and conservation of Langkat's coastal area. The methods were qualitative approach with depth interview, participation observation and Focus Group Discussion and quantitative approach that used multiple regression analysis as models. The result of this research shows that: the local wisdom in coastal area community was a part of local tradition process that comes from life experiences for years. It was stronger with the process of learning that came from introducing the conservative values that was transformerred by the policy maker. The coastal community income that has relationship with sea and coastal area was affected by working time allocation, the distance between house and sea or coastal area, and the others income that have no relationship with sea or coastal area. While the level of education and age have no effect to coastal community income.

Keywords: Coastal Area, Local Wisdom, Cultural Ecology and Sustainable Management of Coastalarea.

Jel Code : A13, Q01, Q26, Q27 & Q57

INTRODUCTION

The strong relationship between local community with coastal resources is still strong on coastal area. In some locations, the pattern of interactions gave the positive effect to natural environment conservation (Wiratno *et al.* 2004; Dear & Meyers 2005; Kameri-Mbote 2006). The management and the protection of environment include of mangrove ecosystem based on local wisdom needs comprehensive management strategic. The approaches actually was done by empowering and community development.

The local community has commitment and accountability to manage resources with adaptive benefit to local wisdom (Korten 1986). "Dayak Tribe" traditional knowing in Anak Benuaq Village could conserve the forest natural resouces for 300 years without the permanent forest clearing and finding no local species was disappeared or killed (Gonner 2001:70). The Baduy community has local wisdom: to use and keep the ecosystem as a sustainable supplier of needs (Handoyo 2003). The forest local management can make social balanced, economy security and sustainability of natural environment and forest conservation (Darusman 2001).

This research primarily uses the local wisdom that existing in coastal community. It becomes developed for conservation strategic of managing sustainable coastal area at Langkat Regency. It becomes so crucial when the mitigation efforts to climate change through local wisdom of coastal community. The mangrove conservation activity, as a media of carbon absorbing, nowadays is become so fragile to exploitate. After identify and analyze the forms of local wisdom that still exist in managing coastal area at Langkat Regency, analyzing relationship and or the affect of social economy condition and social culture of coastal area community in taking benefit and conserving Langkat's coastal area; and to analyze the forms of local wisdom that still exist and can be developed as a sustainable management strategic of coastal area.

According to the explanation, the research problems can be formulated as: What kinds of the local wisdom forms that used for managing local wisdom at coastal area of Langkat Regency; how is the relationship and or the effect of social economy and social culture of coastal area community in taking benefit and conservating Langkat's coastal area; how is the benefit strategy of local wisdom in sustainable coastal area management at Langkat Regency – Indonesia.

LITERATURES

Coastal Area and Potential Natural Resources

The coastal area has so strategic meaning because it interfaces between land ecosystem and sea ecosystem; has a rich potention of natural resources and environment services (Clark, 1996). Its richness has interesting for some agents to take benefit from it. Coastal resources is a natural resource, artificial resource and environmental services that has been found at coastal area. Dahuri, et al (2001) says that the coastal resources potention consists of four groups: (1) renewable resources, (2) non-renewable resources, (3) seashore energy and (4) environmental services. The renewable resources consist of some species of fishes, prawns, seaweed, mangrove, searock and marine culture.

The natural coastal resources management is a process that controlling men or community acting in coastal area. It has been done to control men or community acting in coastal area,so the benefit taking of natural resorces will be done wisely and based on the norms of natural resources conservation oriented (Supriharyono, 2002).

Coastal Resources Management

The management of natural resources, both land resources and sea resouces need to do simoultantly with human resource and artificial resource in sustainable development. The management of coastal natural resources has been done by developing regional planning in unity of dynamic regional planning with the environment conservation and existing natural environment supporting. According to Supriharyono (2000),

some of points in management of natural coastal resources: (a) economy aspect (b) natural environment aspect and (c) social culture aspect.

The economy aspect is how important or not for the daily community needs, the producen of marketable goods, become local, national or international asset, and become tourism asset that making money or goods (Sirojuzilam, *et al.*, 2016). The natural environment aspect consists of beach stability, the unique community environmental, animal and plantation stocks, conservation of nutfah plasm, the aesthetic and cultural identity; and if there was the natural environmental damage by sedimentation, construction, farming, logging, mining, overfishing, the contamination of wasting. The social culture aspect consist of the declare of tradition, social culture values, fighting for conserve tradition to the next generation and religion objectives.

Mangrove Ecosystem

Some of important coastal natural resources and renewable are mangrove forest, searock, seaweed and fishery. The mangrove forest was the unique zone/area. It was locate between sea and land component, that consist of sea vegetation and fishery (coastal) what has been existing in beach area and river area (out of beach forest formation) that regularly covered with sea water. The sea vegetation and fishery (coastal) mangrove can be identified by some varietes as *bakau* (Rhizopora spp), *api-api* (Avicenia spp.), *prepat* (Sonneratia spp.) and *tinjang* (Bruguiera spp.).

The width of mangrove forest in world is approximately 15,9 milion hectares, and Indonesia has 4,25 milion hectares (Dahuri, 1997) that exist at all beach region of Indonesia (Wartapura, 1991). On 1993, there has the mangrove forest exist in Sumatera 856.134 hectares (Dahuri, 1997). In North Sumatera Province was exist 60.000 hectares of mangrove forest (Wartapura, 1991, Dartius, 1988) in (Harahap, 2010). Mangrove forest in North Sumatera was spreading on East Coast, caused of: 1) The East Coast has lower land area than West Coast. 2) There are many big rivers at Sumatera that flow to East Coast. This condition pushed the growth of mangrove forest is more fertile and more wider. It causes many sedimentation are bringing by river flows (Dahuri, 1997).

According to Dahuri (2000) since 1993, the degradation of sealand and mangrove area about 52% from 5,2 milion hectares in 1982 to became 2,5 milion hectares. It means that in 11 years, a half had been damaged. From the datas, 40% was existing at Irian Jaya.

Local Wisdom and Cultural Ecology Theory

According to Ahimsa-Putra (2008) local wisdom is some of knowledge instruments and good practices that came from the generations before; from the previous experience that have relationship with this environment and others community; that can be used for problem solving to some problem or difficulties rightly and kindly.

Wahyu (2005) says that local widom has an advantage that was taken by locally sustainable experiments. It so elastic and adaptive with environmental change, so in taking benefit from it, natural resources and environment can sustainble. Local knowledge adressed to make it suitable for ecology system, so that keep the ecology system sustainable.

METHODS

Research Location

This research was done in coastal area at Langkat Regency - Indonesia. The location was choosen by some arguments: this location has direct border to the sea and the coastal was nearer to the land. It was indicated that there had local wisdom potent in taking benefit and conservating the coastal natural environment. This research was done at Jaring Halus Village Secanggang District, Lubuk Kertang Village Brandan Barat Village and Suka Maju Village Tanjung Pura District in In North Sumatera Provinc, Indonesia.

Key Persons and Research Sample

The information men in this research are a part of key persons that could give many informations in this research. It can added if it became important and could give more informations that relevant with this research. There is no border for the amount of key persons; as long as the datas could give the answers to this research. The samples were done by probability sampling, was taken propotionally from three villages in three districts at Langkat Regency. The sample size was calculated using Slovin formula (Muda *et al.*, 2016 and Lubis *et al.,* 2016).

The Technique of Collecting Datas

The source of datas: the source of primary datas and secondary datas. The primary data would got from depth interview, the questionaire and observation and participant observation that addressed to get information about the forms of local wisdom in coastal area management, and sharply with Focus Group Discussion (FGD). The FGD is used for getting the strategy of taking benefit from local wisdom in coastal area management at Langkat Regency became more applicative, so that it could be developed to sustainable coastal area which were suitable condition with local context.

The others guiding instrument were camera and tape recorder. They were very useful to avoid lost datas and could documentated the activities of coastal community. Researcher was developed rapport (the good relationship with object/key person). It aimed to closer the distance, less suspicious, and things that could disturb the interview.

Datas Analysis

The analysis method in this research are qualitative method and quantitative method:

1. To analyze the first research problem was used descriptive qualitative analysis (Sirojuzilam, *et al.*, 2016; Muda *et al.*, 2015;2017 and Tarmizi, *et al.*, 2016;2017). To describe the benefit of local wisdom in coastal area management by coastal community at Langkat Regency with the emphasize of cultural ecology concepts primarily on natural resources and the rules or norms that become the behaviour guidance on natural resources exploitation.
2. To analyze the formula of second research problem: the effect of coastal community social economy condition and social culture in exploitation and conservation of coastal area at Langkat Regency was used Multiple Linier Regression. The formula:

$Y_{LRT} = A + a_1P_{RT} + a_2U_{KK} + a_3E_{KK} + a_4CL_{RT} + D_{RT} + YE_{RT} + e$

Y_{LRT} = Income from coastal area working in coastal community household (rupiahs per month)

A = *intercept*

$a_{1....}a_4$ = regression coefficient

P_{RT} = household participation in conservating coastal area (hours per month)

U_{KK} = the ages of household principal

E_{KK} = the education level of household principal

YL_{RT} = working time allocation of coastal area working in coastal community household (hours per month)

D_{RT} = the distance of house to coastal area

YE_{RT} = Income from non-coastal area working in coastal community household (rupiahs per month)

e = disturbance error

The Slovin formula was used to calculate the sample with 10 percent terms of error.

$$n = \frac{N}{1 + Ne^2}$$

n = total of sampling

N = total of population

e = critical value (%)

Source: Sugiyanto, 1998

From the statistic datas of Langkat Regency, it has 55.546 households that lived on coastal area and 100 households became the samples. To calculate the samples from 55.546 population of coastal area households at Langkat Regency was used Slovin formula as below:

$$n = \frac{N}{1 + Ne^2}$$

$$n = \frac{55.546}{1 + 55.546.0,1^2}$$

n = 100 coastal area households

There are 55.546 coastal households that spreaded on some districts include Brandan Barat District, Secanggang District dan Tanjung Pura District. Among them, the district that has much coastal area households is Brandan Barat District has 6.027 households, Secanggang District has 8.423 households and Tanjung Pura district has 5.625 households. The researcher take 30 households sample on Brandan Barat District, 40 households sample on Secanggang District and 30 households sample on Tanjung Pura District.

3. To make the strategic planning of exploiting local wisdom in sustainable coastal area management was used Focus Group Discussion (FGD), and was simulated as feasibility studies the conceptual model of coastal area management with expert, researcher with government

institution, natural environment of non-government organization, Independent Society Group on Langkat Regency.

RESULT AND DISCUSSION

Local Wisdom in Mangrove Ecosystem Management

Jaring Halus Village at Secanggang District

Jaring Halus Village is a coastal village that was located at Secanggang District, Langkat Regency. This village was a coastal village that majority was Melayu Tribe and a little amount of Banjar Tribe. To reach this location, boat ship was used. It starts from Batang Buluh Port Tanjung Ibus Village at Secanggang District.

The fishes catchment in this village are various: cecah rebung fish (*cerbung*), shrimp, tuna, crab, shell, etc. On sharing system, the small fisher in Jaring Halus knew"patron-klien" is the boss and the lower. The small fisher used the boss equipment, so the selling and buying activity of the catchment was given to the boss.

This village has two leader: culture leader and village leader. The village leader takes care about administration matters. The "*pawang*" takes care about the sea traditonal ceremony grateful and avoid from mystic affairs. There are two routine activities from "*pawang*" activities on Jaring Halus Village: "*Jamu Laut*" Ceremony and "*Tolak Bala*". Both of these activities were the part of coastal community local wisdom to survive.

"*Jamu laut*" was a traditional ceremony that was done by many community on coastal area. "*Jamu laut*" was done by coastal community because something as their catchment was less than usually, the grateful to big amount of catchment. The ceremony cost of "*Jamu Laut*" came from the community at Jaring Halus Village. The ingredients were yellow rice around with various traditional cakes and foods; and then, it was brought to the beach and getting duu'a by the "*Jamu Laut*" participation community.

To the community at Jaring Halus Village, the local wisdom that based on manage tradition of coastal area through "*Jamu Laut*" and "*Tolak Bala*" were became the embryo of the community politeness to nature environment. When Jaring Halus Village was established, the mangrove was the sacred plantation that was named "Ketapang Tree". Till nowadays, the local community made "ketapang tree" as a part of mangrove ecosystem that was very important to be protected.

The communal awareness to manage mangrove sustainably became stronger with many independent society institutions that taking care about natural environment. It takes care about natural environment and giving knowledge and protection to their mangrove forest region. They are JALA, YAGASU and SNSU. The institutions were succesful in persuading the local community to keep, conserve and protect their mangrove forest. Their activities to conserve the mangrove forest is log and plant. Some groups are formed to control and seeding of the mangrove forest.

Lubuk Kertang Village at Brandan Barat District

Mangrove that existing at Lubuk Kertang Village still in good condition while there was a width decrease of mangrove forest. The width of mangrove forest at Lubuk Kertang Village was about 64 hectares.

According to the key person, at past, the width of mangrove forest at Lubuk Kertang Village about 600 hectares. Many hectares of mangrove forest was already became the palm tree and the oil and gas mining. The land of mangrove forest was sold to palm oil firm on 2009.

The degradation area of mangrove tree was because of the logging to make coal. Uniquely, the people not from Lubuk Kertang Village that take the mangrove tree. For nowadays, the mangrove stolen has been decrease. The village community was started to palnt mangrove since 2012 when an independent society institutions, Yagasu has been coming to Lubuk Kertang Village. Yagasu has been giving the lessons about the impotance of mangrove to community's life. Another non-government institution that gave the lesson how to plant mangrove together was *HNTI (Himpunan Nalayan Tani Indonesia)*.

Suka Maju Village at Tanjung Pura District

This village is not a coastal village as the others. The access from the sea was about one hour by boat. Though that, the occupation of the community was farmer and fisher. When the planting time was over, they were looking for shrimp or crab to the sea for household needs. When the rain falls, they plant rice on farm. Sometimes, their farm covered with flood that cause them have to find another job.

In 1990, the community worked to find woods and then being sold to the owner of coal fabric in this village. At that time, ther was no legal to log the woods at mangrove forest. But, the rules was still breaking by them, with life needs as a reason. It made the forest damaged. Another thing that made the mangrove forest damaged was the forest land turned into shrimp ponds.

In 2005 there was the self awareness from the community to plant the forest that promoted by PARAS. PPA and Langkat Government controlled that activities. The mangrove logging has been restricted since 2000, but the coal fabric were still exist and need the fuel. It made the illegal logging was still done.

The institutions were named JALA, YAGASU and SNSU have been coming to Jaring Halus Village. The presence of them were very affected to thinking form of local community about mangrove conservation. They now understand how mangrove forests have big effect to them.

Model Estimation of Coastal Community Income from Coastal Area Working at Coastal Community Households at Langkat Regency North Sumatera Province

The factors that affected to income from coastal area working in coastal community household = f (household participation in conservating coastal area, the ages of household leader, the education level of household leader, working time allocation of coastal area working, the distance between house and coastal area, and income from non-coastal area working).

Multiple Linier Regression for Coastal Income of Coastal Community at Langkat Regency

$$Y_{LRT} = 327{,}357 + 0{,}003\ P_{RT} + 0{,}004\ U_{KK} + 0{,}009\ E_{KK} + 0{,}039\ CL_{RT} - 0{,}089\ D_{RT} - 0{,}869\ YE_{RT} + e$$

Y_{LRT} = Income from coastal area working in coastal community household (rupiahs per month)

A = intercept

$a_{1....}a_4$ = regression coefficient

P_{RT} = household participation in conservating coastal area (hours per month)

U_{KK} = the ages of household leader
E_{KK} = the education level of household leader
YL_{RT} = working time allocation of coastal area working (hours per month)
D_{RT} = the distance between house and coastal area
YE_{RT} = working time allocation of non-coastal area working (hours per month)
e = disturbance error

Table 1
Regression Result of Factors that Affected to Income From Coastal Area Working in Coastal Community Households

No	*Independent Variable*	*Regression*	*t count*	*P value*
1	Constanta	327,357	50,968	0,000
2	Participation	0,003	0,145	0,885
3	The age of leader	0,004	0,868	0,388
4	Leader education level	0,009	1,539	0,127
5	Time Allocation	0,039	2,335 **	0,022
6	Distance from coastal	-0,089	-2,890***	0,005
7	Another income	-0,869	-32,590***	0,000
	t table (1%)	2,36461		
	t table (5%)	1,66039		
	t table (10%)	1,29016		

Source: Data Processed, 2016

*** = Significant on error term 1%

** = Significant on error term 5%

The Discussion of Factors that Affected to Income From Coastal Area Working in Coastal Community Households

1. **The household participation of conservating coastal area**: Coefficient of household participation in conservating coastal area 0,003 was not significantly affected to income from coastal area working. This was caused of the works that made income from coastal area working only exploitationly and has only a little relation with conservating efforts.
2. **The Age of Households Leader**: Coefficient of the age household leader 0,004 was not significantly affected to income from coastal area working. This was caused of the age was not affect to households leader activity of coastal area.
3. **The household leader's education level**: The coefficient of household leader's education level 0,009 was not significantly affected to income from coastal area working. This was caused of the household leader's education level was not guarantee for income amount from coastal area working. The fishery activities needed a little formal education but needed much experience.
4. **Time allocation of coastal area working:** The coefficient of time allocation of coastal area working 0,039 significantly affected to income from coastal area working. It means that if the working time

allocation of coastal area working increase 1%, the income from coastal area working will increase 0,039% on error terms 5%. The Langkat community was dominantly Melayu Tribe that slow in working. If they could work harder, their coastal income would increase.

5. **The distance from house to coastal area:** The coeffient of distance from house to coastal area -0,089 was significantly affected to income from coastal area working. It means that if the distance from house to coastal area nearer 1%, the income from coastal area working will increase 0,089% on error terms 1%. If the distance from house to coastal area, the income from coastal area working became bigger. The near and easier access to coastal area; just like Secanggang District; made people choose the coastal working such as catching fish, fish pond, fish market, fish collecting, the "bakau" craft and coconut craft and the others working from coastal resources.At Brandan Barat District, that kinds of coastal working were less, so did at Tanjung Pura district. The works were more various with the others, just like farming, husbandry and trading.
6. **The others income**: The coefficient of income from non-coastal area working -0,869. It means that if income from non-coastal area working increased 1%, the income from coastal area working became decrease 0,869% on error terms 1%. If the income from non-coastal area working higher, the income from coastal area working lower. The result of households at Tanjung Pura District showed that the income from coastal area working lower. It was caused of the location that far away from coastal area; so the people done various jobs suach as farming, husbandry and trading.

CONCLUSION

1. The local wisdom in coastal area community was a part of local tradition processing that was got from local community life experience for years.
2. The income from coastal area working was affected by working time allocation of coastal area working, the distance from house to coastal area, and the income from non-coastal area working. The level of education and the ages were not affected. So did the participation in conservating coastal area was not affected too. This was caused of the works that made income from coastal area working only exploitationly and has only a little relation with conservating efforts.

RECOMENDATION

1. The existing of community local wisdom was more stronger with the learning process that came from introducing conservative values transformed by the police maker.
2. To make high participation, it needs a program that has relation with existing local wisdom. So, it will be easier to socialyze the conservating ideas.

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