

Change in Biophysical and Social Environment of Coal-Based Village (Change and Conversion of Forest Area into Coal Mining Area in Tanah Bumbu)

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ABSTRACT

Change and conversion of forest area into mining coal area have resulted in the change in the biophysics environment and social environment of the forest village community. This research aimed to (1) Analyze history, process and factors which underlay the change and conversion of forest area into coal mining area; (2) Analyze the change of biophysical environment condition of coal based forest village before and after the change and conversion of forest area into coal mining area; (3) Analyze the change of social environment condition of coal based forest village before and after the change and conversion of forest area into coal mining area. This research was conducted in Tanah Bumbu Regency, South Kalimantan Province. In order to achieve the research objective, the research method used was quantitative and qualitative approach method which was applied as mixed methodology. The research result indicates that: (1) History, process and factors which underlay the change and conversion of forest area into coal mining area were dominantly influenced by the role of authority structure and other external factors which strongly determined the community of forest village. (2) The presence biophysics environment change in the area surround the forest village due to the change and conversion of forest area into coal mining area (3) The change of social environment of village forest community was due to the change and conversion of forest area into coal mining area which showed an alteration in the social economic aspect and social culture aspect..

KEYWORDS: Biophysics Environment Change, Social Environment Change

INTRODUCTION

When forest area experienced change and conversion into coal mining area, then the mutual dependence relationship or interdependent relationship between forest village community and forest resource will also experience change from extraction pattern to exploitation and confrontation pattern. Forest village community would be dealt with significant change of biophysics environment and social environment. Biophysics environment change which happened due to the conversion of forest area into coal mining area consisted of the change in the forest physical environment and biological environment. This biophysics environment component can illustrate certain ecosystems, including forest ecosystem. Forest ecosystem structure consists of several components, such as climate, water, soil and living things. During the forest conversion process, if the ecosystem change occurs in the forest ecosystem, hence those ecosystem components will experience change as well. This phenomenon is frequently called as biophysics environment change. Meanwhile, the change of social environment, in broad sense, may be defined as process of improvement, growth or even development. The change here is more emphasis on something which has a nature of qualitative within social relationship or change toward equilibrium of social relationship. Social change in broad sense is not always referring to progress but may result in regress within certain community of there is no presence of equilibrium between the improvement of physical aspect and social aspect, as quoted from Hidir [2].

Referring to the backgrounds as mentioned above, this research was intended to (1) Analyze history, process and factors which underlay the change and conversion of forest area into coal mining area; (2) Analyze the change of biophysics environment condition of coal based forest village before and after the change and conversion of forest area into coal mining area; (3) Analyze the change of social environment condition of coal based forest village community before and after the change and conversion of forest area into coal mining area. The researchers hope that the result of this research can be practical and academic carrying capacity for the interest if various parties and groups in understanding the change of biophysics environment and social environment due to the change and conversion of forest area into coal mining area.

The main problem which was faced by forest village community, who lived around the coal mining area, was related to their accessibility and dependence on utilization of land and forest product which began restricted due to the change and conversion of forest area into coal mining area. Initially, the forest area was the source of livelihood and the source of cultivated land. It also possessed protection function and climatic system function that could be used by forest village community either directly or indirectly. However, the presence of

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coal mining activity in the forest area has caused significant biophysics environment changes which followed by social environment change.

MATERIALS AND METHODS

Research Location

The locations (site) where this research conducted were Bukit Baru Village, Satui Sub-district, Teluk Kepayang Village, Kusan Hulu Sub-district, and Mantewe Village Mantewe Subs-district. Those three villages, where the research conducted, located in Tanah Bumbu Regency. The selection of those villages were based on the largest area of forest area where change and conversion into coal mining area took place and the location of those villages were exactly within and surround the forest area and coal mining area. The selection of the research location was also based on the number of coal mining activity around those villages.

Type and Approach of Research

Based on the research type, this research is categorized as explanatory or explanative type. According to Sarman [3], explanative research is type of research which is oriented to an effort to explain cause and effect of certain social phenomena used as the object of study. Meanwhile, research method approach used in order to achieve the research objective was quantitative and qualitative approach. Tashakkori, Charles [4] call it mixed methodology as a study which constitutes a product of pragmatic paradigm by combining quantitative and qualitative approach in different phases of research process.

Data Collection Technique

Collection technique for quantitative data was conducted by filling a questionnaire to 95 respondents that conducted through structured interview technique. Structured interview is an interview through the use of written question in which the answer alternatives are available and may be in the form of questionnaire. In terms of qualitative data collection technique, it was conducted by triangulation technique in which the data was collected from the same sources and conducted in various ways that involved combination of participative observation, in-depth-interview and documentation.

Data Analysis

First objective was analyzed with qualitative approach based on Miles and Huberman interactive model and enumeration technique quantitative approach (tabulation and percentage). Second objective was analyzed with Wilcoxon Match Pairs T-Test and continued with qualitative analysis based on Miles and Huberman and Agro-ecosystem Analysis. The third objective was analyzed with Wilcoxon Match Pairs T-Test and continued with qualitative analysis based on Miles and Huberman and Agro-ecosystem Analysis.

RESULTS AND DISCUSSION

History, Process and Factors Underlay the Change and Conversion of Forest Area into Coal Mining Area

The change and conversion of forest area into coal mining area was happened due to certain process and history in which the process of change and conversion of forest area into coal mining area has been taking place since 1990's. The change and conversion process of forest area into coal mining area was not the willingness of people in forest villages, who lived around the coal mining area, but it was the investors (entrepreneurs) which came from central and regional/local who willing to make the change and conversion in which they were supported by the policy and regulation of both central government and regional government. Process of change and conversion of forest area into coal mining area were undergone in 2 ways. Firstly, the change undergo instantly from natural forest into coal mining area. Secondly, it undergo gradually, where the forest was exploited in advance by the holder of HPH concession (Forest Exploitation Rights) and then continued with the change and conversion into coal mining area.

Factors that underlay the change and conversion of forest area into coal mining area was externally due to the policy and regulation of central and regional government which allows mining company to perform coal mining activity. It was also due to the demand from the investors (entrepreneurs) which came from central (capital city) and regional/local to conduct activity in the field of coal mining. Meanwhile, the internal factors which underlay the occurrence of the change and conversion of forest area into coal mining area were the perspective or self-motivation of the family or people of the village to live in more advance and prosperous living which were aroused by job offer, job opportunity, and business opportunity for those who lived around the mining area. Besides, there were an offer of compensation and indemnity for forest lands that were claimed as the community land. There was also commitment from coal mining company for the village community through Corporate Social Responsibility (CSR) program to develop the area and to empower the people. Forest village community were also influenced by *internal force* and *external force*, such as from village official,

community leader, officials of Sub-district and Regency Government) and influenced from their neighbors and the farmers who already gained indemnity or compensation from the company, which made them let the coal mining company to conduct activity of coal mining in the forest area. A total of 95.79% respondents stated that the change and conversion of forest area into coal mining area were occurred through certain process and history due to the presence of particular factors which led to the change and conversion of forest area into coal mining area, meanwhile, 4.21% respondents stated that they were disagree with that statement.

Change of Biophysics Environment Condition of Coal Based Forest Village.

Analysis result of Wilcoxon Match Pairs T-Test on the condition of biophysics environment of coal-based forest village after the change and conversion of forest area into coal mining area indicated that value fell down from 219.07 to 177.27 and it was found that statistic W data was at 0 lower than critical value of W (value at W table), or $Whit < W$ table, which was good for significance level of 5%. Probability values of Wilcoxon Match Pairs T-Test on the condition of biophysics environment of coal-based forest village after the change and conversion of forest area into coal mining area was at the average of 0.000 ($P = 0.000$) less than significance level value of 5% ($\alpha = 0,05$) or $P \leq \alpha$. As a result, based on criteria, null hypothesis (H_0) was rejected if $\alpha \geq p$ and conversely alternative hypothesis (H_a) was accepted, then it could be concluded that the condition of biophysics environment of coal-based village forest before and after the change and conversion from forest area into coal mining area was difference.

Based on the result of Wilcoxon Match PairsT-Test, it could be interpreted that due to the change and conversion of forest area into coal mining area, biophysics environment of village forest has experienced significant change. The change has covered 5 indicators of biophysics environment change, such as a change of (1) Availability of forest resource based on the wealth and diversity of flora and fauna of forest area. (2) The condition of modest plantation and gardening of village forest community. (c) The condition of landscape, land and forest land. (3) Condition of water sources/springs. (4) Quality of air, dust and noise. Lastly, (5) Human built structure. Those five indicators of changes were outlined into 15 variable items of change of forest biophysics environment condition. Based on the result of Wilcoxon Match PairsT-Test, the change condition of the biophysics environment is illustrated with the following graphics.

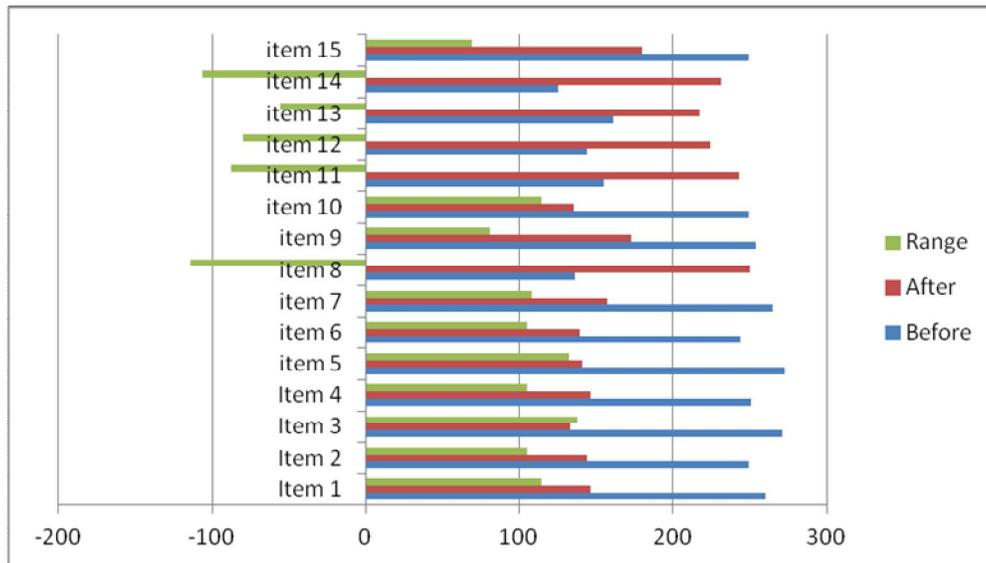


Figure 1 Diagram of Score Change on Each Item of Biophysics Environment Change

Based on the result of Wilcoxon Match Pairs T-Test on those 15 variables biophysics environment condition, we can see significance difference as described at Table 1. The table shows that the scores, before and after the change and conversion of forest area into coal mining area, experience change. The major change occurs at item variable 3 where there is a change of wealth and diversity of bird fauna in the forest area. The minor change can be seen in item variable 3 where the land and forest land turn into lakes due to the change and conversion of forest area. Other changes can be seen in biophysics environment of village forest variable, such as change in wealth and diversity of flora of both wood forest product and non-wood forest product, other fauna wealth and diversity such as wildlife species and wildlife hunting, the availability of land and forest land for farm and mixed garden, water sources and the availability of village infrastructure.

Table 1 Result of Wilcoxon Match Pairs T-Test On the Change of Biophysics Environment Condition of Coal Based Forest Village

Item	Score			Wilcoxon Test Result		
	Before	After	Difference	Z	P-value	description
Item 1	260	146	114	6.915	0.000	significant
Item 2	249	144	105	6.327	0.000	significant
Item 3	271	133	138	8.116	0.000	significant
Item 4	251	146	105	6.366	0.000	significant
Item 5	273	141	132	7.853	0.000	significant
Item 6	244	139	105	6.367	0.000	significant
Item 7	265	157	108	6.701	0.000	significant
Item 8	136	250	-114	6.106	0.000	significant
Item 9	254	173	81	5.391	0.000	significant
Item 10	249	135	114	6.527	0.000	significant
Item 11	155	243	-88	5.200	0.000	significant
Item 12	144	224	-80	5.104	0.000	significant
Item 13	161	217	-56	4.254	0.000	significant
Item 14	125	231	-106	6.872	0.000	significant
Item 15	249	180	69	4.768	0.000	significant

Source: Primary Data Processing, 2013

The change in the biophysics environment was analyzed further with agro-ecosystem approach in order to find out its performance. Agro-ecosystem performance can be seen from productivity, stability, equitability and sustainability. The performance of agro ecosystem is influenced by management system, business orientation, type and diversity of product. In terms of productivity, management and utilization of forest resource implemented by community after the change and conversion of forest area into coal mining area indicated significant decrease of productivity. Decrease of productivity was not only happened to the forest as economic source but also the forest as ecology source. Related to stability which defined as carrying capacity of the existing forest resource to produce and yield and free from disturbing natural factors also experienced drastic decrease. The decrease performance was mainly due to disturbance from external factor which changed forest area into coal mining area.

Similarly, equitability, which defined as the ability of forest resources to be utilized and managed in order to be equally distributed for those who are entitled, in recent condition, there has been change for both horizontally among the village forest community and vertically between village forest community and companies. The last point of the agro-ecosystem performance concept is related to sustainability. Sustainability refers to a system of defend against large disturbances in order to secure the quality and productivity of system from decreasing. In terms of sustainability aspect, decrease of productivity, disruption of stability, and disparity of equitability caused the sustainability of forest area agro-ecosystem that changed and converted into coal mining area, was disrupted as well. Due to the disruption of the sustainability of the agro-ecosystem, the element of productivity, stability, equability and sustainability in the framework of management and utilization of the existing forest resource was not fulfilled as well. As a result, we can conclude that the performance of forest area agro-ecosystem that changed and converted into coal-mining will not be durable and sustainable from time to time.

The change in biophysics environment is in line with Poerwanto [5] who states that the relationship between human and bio-geophysics is not merely dependence relationship but also interrelationship which can change the bio-geophysics environment. The change in biophysics environment is also in line with the argumentation from concept and theory of Open System proposed by John. W.Bennet, A.Terry Rambo and Gerald G. Martin where the core concept of this Open System theory constitute a set of component and element which exist within the mutual interdependence. When one of main elements experiences change, then it will directly or indirectly affect other elements. In the context of biophysics environment change in the area around village forest due to the change and conversion of forest area into coal mining area, there will be interrelationship between and social system and ecosystem through the flow of energy, material and information. Besides, input from external will also influence the structure and function of parts of the social system and ecosystem. Therefore, both systems may experience change and internal dynamic, as quoted from Bennet [6] ;Rambo [7] ;Martin [8]. According to Pramova *et.al* [9], ecosystem provide important service which may help human adapt to climate variability and change. Realizing the importance role of ecosystem, ecosystem based approach for adaptation is indispensable.

Rambo as quoted by Simon [1] clearly describe interdependence relationship between biophysics environment (ecosystem) and social environment (social system) through human ecology concept which states that the nature of agro-ecosystem reflects the existence of energy efficiency, economic efficiency, and harmony with other system (*compatibility*), dependence on other system (dependency), accepted by the existing culture (*cultural acceptability*). As human ecologist, Rambo's approach is started from the presence of flow of energy, material and information within and between the systems. Energy efficiency is measured based on the

comparison of energy result (food, fodder, and fuel) which can be used as input to manage the system. Economic system can be measured based on comparison between the benefit generated and the cost spent. Harmony is compatibility among agro-ecosystem that supports each other. Dependence is measured based on agro-ecosystem which always supported by input from other social system and environment system. Biophysics environment change as described above strengthens the concept and theory of Open System. In line with that opinion, Artur , Holhorst [6] proposes that adaptation to climate change must be carried out in line with social process and institutional history which grow and develop as an implementation of closed interdependence relationship between biophysics (ecosystem) and social environment (social system).

Change in the Condition of Community Social Environment of Coal Based Forest Village

Change in the community social environment of coal based forest village in this research covers the change in economic social condition of village forest community and change in social culture condition of village forest community. Both changes in the social environment condition can be described as follows:

Change in Social Economic Environment Condition of Coal Based Forest Village Community

Study on change in social economic environment condition of coal based forest village includes 2 aspects, such as: *First*, study on the household economic condition of the forest village community, such as study on the livelihood condition of forest village community; forest village community income; proportion of forest village community income which derived from forest and non-forest source; the viability of household economic (food, clothing and shelter); opportunity for community to held business and to work in other economic activity. *Secondly*, study on the role and contribution of forest resource for people of village forest, for example, direct and indirect benefit obtained by people from the forest; production system and consumption of forest product traditionally; distribution channel and marketing of forest product along with potential market and price of local/traditional product from the forest in the form of wood and non-wood; the number of land/forest land ownership for formulating forest product, hunting, farming and gardening along with the distribution among the community.

Economic Condition of Forest Village Community

Change which taken place in the economic condition of forest village community before and after the change and conversion of forest area into coal mining area was studied based on the household economic condition of forest village community, such as study on the livelihood of forest village community; forest village community income; proportion of forest village community income which obtained from forest and non-forest resource; viability of household economic (food, clothing and shelter); opportunity to open business and work for the community in other economic activity. Significance change happened to the average income of family in a year which increase after the change and conversion of forest area into coal mining area, the change also happened to the type of livelihood which derived from forestry sector and non forestry sector, distribution of income proportion of forest village community, the involvement of family member in the effort to increase family economic income from non forestry income, fulfillment of basic needs in the form of clothing for family, provision to health, education, household economic viability, facility and infrastructure until the transformation of male, female and children role toward household economic viability. All of those variables experienced significance change after being analyzed with Wilcoxon Match Pairs T-Test.

Based on the above analysis, the average score of measurement of forest village community economic condition before and after the change and conversion of forest area into coal mining areas is obtained. It increases from 196,73 to 231,53 and based the analysis of statistic data, it is obtained that W is 0 less than critical value W (value of table W), or $W_{hit} < W_{table}$ for significance level of 5%. Probability value of T-Test result has average score on the economic condition before and after the change and conversion of forest area into coal mining area at the amount of 0.013 ($P = 0.013$) less than the value of significance level of 5% ($\alpha = 0.05$), or due to $P \leq \alpha$, H_0 (null hypothesis) is rejected and H_a (alternative hypothesis) is accepted. Therefore, we can conclude that there is significance difference on the economic condition of forest village community before and after the change and conversion of forest area into coal mining area. Based on the Wilcoxon Match Paris T-Test, it can be concluded that there is a different in the household economic condition of forest village community before and after the change and conversion of forest area into coal mining area. The illustration of 15 variable items of the environmental change can be seen on the following diagram.

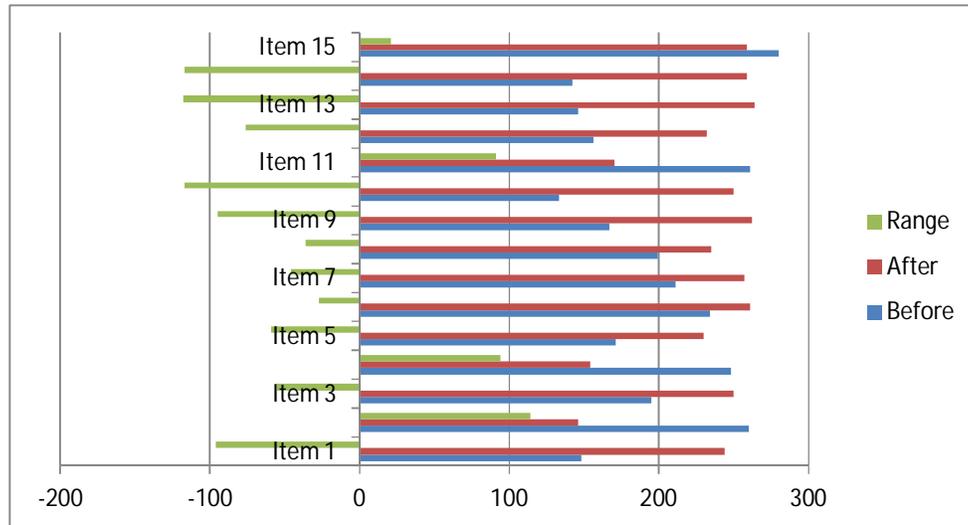


Figure 2 Diagrams of Score Change for Each Item of Forest Village Economic Condition

Based on the Wilcoxon Match Pairs T-Test on the forest village community economic condition indicator, all variables show the presence of significance difference on the economic condition before and after the change and conversion of forest area into coal mining area as can be seen in Table 2. The major change happen to variable item 2, it relates to the change of livelihood type of forest village community who previously relied on the available forest resource and minor change happens to variable item 13, it relates to the facilities and infrastructure of transportation, such the street land as a medium of residence mobilization. Other variables also experience change on the second change ring of related variables.

Table 2 Wilcoxon T-Test Result of Forest Village Community Economic Condition

Item	Score			Wilcoxon Test Result		
	Before	After	Difference	Z	P-value	Description
Item 1	148	244	-96	6.424	0.000	significant
Item 2	260	146	114	7.502	0.000	significant
Item 3	195	250	-55	3.941	0.000	significant
Item 4	248	154	94	6.334	0.000	significant
Item 5	171	230	-59	4.658	0.000	significant
Item 6	234	261	-27	2.862	0.004	significant
Item 7	211	257	-46	3.988	0.000	significant
Item 8	199	235	-36	2.514	0,012	significant
Item 9	167	262	-95	5.799	0.000	significant
Item 10	133	250	-117	6.959	0.000	significant
Item 11	261	170	91	5.928	0.000	significant
Item 12	156	232	-76	4.759	0.000	significant
Item 13	146	264	-118	6.645	0.000	significant
Item 14	142	259	-117	7.030	0.000	significant
Item 15	280	259	21	2.446	0,014	significant

Source: Primary Data Processing, 2013

The Role of Forest Resource for Forest Village Community

The study on role of forest resource for forest village community in this research covered the study on the role and contribution of forest resource to forest area community, such as direct benefit which obtained by the community from the forest; production system and forest product consumption in traditional nature; distribution channel and marketing of forest product along with the potential market and price of local/traditional forest product which derived from both wood and non-wood; the number of land/forest land ownership for formulating forest product; hunting, planting and gardening along with the distribution to the community.

The result of quantitative analysis and hypothesis test on the condition of forest resource role toward village forest community after the change and conversion of forest area into coal mining area indicates decrease of score, the measurement showed that the average score before the change and conversion of forest area into coal mining area was 396.36 but then decrease to 356.73. Based on analysis on statistic data, it was obtained the value of W is 0 less than critical value of W (value of table W), or $W_{hit} < W_{table}$ for significance level of 5%. Probability value of T-Test result showed average score of the condition of social status and role of farmer

before and after is 0.011 ($P = 0.011$) less than significance level value of 5% ($\alpha = 0.05$) or because $P \leq \alpha$, as a result, based on the criteria, H_0 (null hypothesis) is rejected if $\alpha \geq p$. Thus, we can conclude that there is a difference condition of forest resource role for forest village community before and after the change and conversion of forest area into coal mining area.

Based on the Wilcoxon Match Pairs test result, it can be inferred that there is difference condition concerning the role of forest resource for forest village community before and after the change and conversion of forest area into coal mining area. However, one should be considered that the difference condition of the role of forest resource for the village forest community tend to decrease. It can be seen from the average score before the change and conversion of forest area and after the change and conversion of forest area, each variable or sample used or taken in this research and some items are significant which strongly influence the average score of other items. Bar chart containing score change of each item can be seen in the following figure.

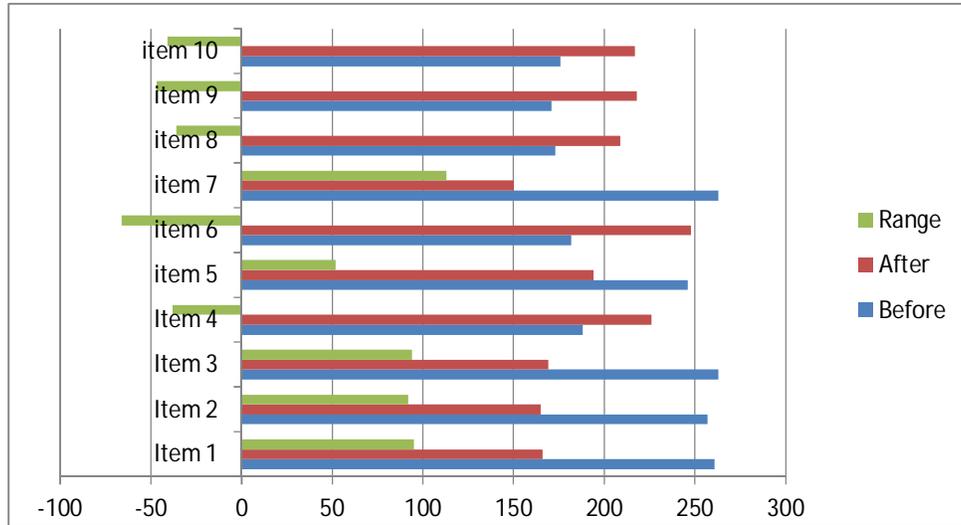


Figure 3. Diagram of Score Change of Each Forest Resource Roles Item for Forest Village Community

The condition of forest resource roles for forest village community showed significance difference as can be seen in the Table 3. The significant difference as the reflection of the major change in the forest resource roles for forest village community happened in item variable 7. It relates to the need of land and forest land for hunting, planting and gardening. Meanwhile, the minor change happened in variable item 7. It is about the ownership of available land and forest land for the purpose of hunting, planting and gardening in forest area as communal ownership. Other changes also happened to other variables, such as the change in the benefit of forest product function aspect obtained by the community, the change in the benefit of protection forest function aspect obtained by the community, the change in the benefit of forest climate system aspect obtained by the community, production system and forest product consumption, forest land for planting, mixed gardening and hunting owned individually and by family.

Table 3. The Result of Wilcoxon Match Pairs T-Test on the Roles of Forest Resource for Forest Village Community

Item	Score			Wilcoxon T-Test Result		
	Before	After	Difference	Z	P-value	Description
Item 1	261	166	95	6.278	0.000	Significant
Item 2	257	165	92	6.176	0.000	Significant
Item 3	263	169	94	6.374	0.000	Significant
Item 4	188	226	-38	2.388	0,017	Significant
Item 5	246	194	52	3.681	0.000	Significant
Item 6	182	248	-66	4.677	0.000	Significant
Item 7	263	150	113	7.391	0.000	Significant
Item 8	173	209	-36	2.481	0,013	Significant
Item 9	171	218	-47	2.531	0,011	Significant
Item 10	176	217	-41	2.924	0,003	Significant

Source: Primary Data Processing, 2013

In terms of social economic aspect, it was also found difference of social economy condition on coal based forest village community before and after the change and conversion of forest area into mining area. The

social economic condition differences covered difference of household economic condition of forest village community and the roles of forest resource contribution for forest village community. It means that the fact support the assumption of Parsons's structural functional theory as quoted from Ritzer and Goodman [10] which stated that the change in the household social economic condition of forest village community and the change in the forest resource contribution towards village forest community aim to create creating family social integration. System tends to maintain equilibrium which consists of maintaining border and relationship among the parts with the whole system, controlling difference environments and tend to change the system from the inside. Structure of community order which lead to equilibrium will appear after the social change process happens as quoted by Parson [11]. Community act in order to make rapid change is related to biophysics environment change which affects social environment also indicate the presence of rational action of Max Weber which included as instrumental rational act, quoted by Jhonson [12][13]. Afterwards, the ability of community to capture the symbols of change which will lead them to think and find out new economic source alternative in the forest area constitutes implementation of symbolic interactionism theory proposed by George H. Mead which place mind and self that an individual interact with him/herself by using meaningful symbols so that community life is formed through learning process which gives human freedom to choose their action and goal they want to achieve. The potency of one's mind and soul also determines the process of need fulfillment is in line with the symbolic interactionism theory proposed by George H. Mead which stated that mind, soul and individual become the key processes of someone's act. According to Wreford, Adger [14] from time to time, farmers are always able to adapt to environment change that the ability to learn from the past is required during adaptation process. Based on Van Glasenapp *et.al* [15] description, within marginal and changing socio ecology condition, adaptation of a household in the middle of environment change is the most powerful unit. Adaptation is carried out on the management of labor and production based on the traditional ecology knowledge that someone posses. Adesina AA, Chianu J [16] mentioned that a number of farmers in Nigeria adopted technology to conduct experiment with various configurations from the adopted technology. There is requirement for sustainable effort to adapt to technology variant so that it will more suitable with the farmers' need. Hence, as stated by Berman *et.al* [17], institution roles is required during sustainable adaptation transformation which will contribute to better understanding and influence the ability of rural community to increase their adaptive capacity. The existence of the institution will also assist the dissemination of information on the adaptation planning to rural community that enables this community to achieve a more sustainable future.

Community Social Culture Condition

Study in social culture condition of coal based forest village was focused on the study on customs, values, social cultural norms and technology which relate to the ability to manage and control forest resource in traditional nature consisting of ownership and communal rights toward forest, soil and water which were still adhered to. Customs, values, cultural norms and management technology of forest resource have broad scope so that study on some components on this research was focused on customs, values and cultural norms which were still adhered to in the community, such as beliefs and taboos in forest resource management, ethics and rules in forest resource management, technique and aspect of job and business opportunity, local wisdom and philosophy in managing forest resource. The result of quantitative analysis and hypothesis test of social cultural condition of forest area community after the change and conversion of forest area into coal mining area showed that from the average score 424.67 decreases to 299.67. Based on data analysis result, probability value of T-test result was obtained, the average score on social cultural aspect before and after the change and conversion of forest area into coal mining area was 0,000 ($P = 0,000$) less than significance level value of 5 % ($\alpha = 0.05$) or because of $P \leq \alpha$, it can be concluded that there was difference condition before and after the change and conversion of forest area into coal mining area in the aspect of social culture of forest village community. Wicoxon Match Pairs test result indicates that alternative hypothesis (H_a) proposed in this research was accepted. It means that null hypothesis (H_0) is rejected. The illustration of the change can be seen on the following diagram.

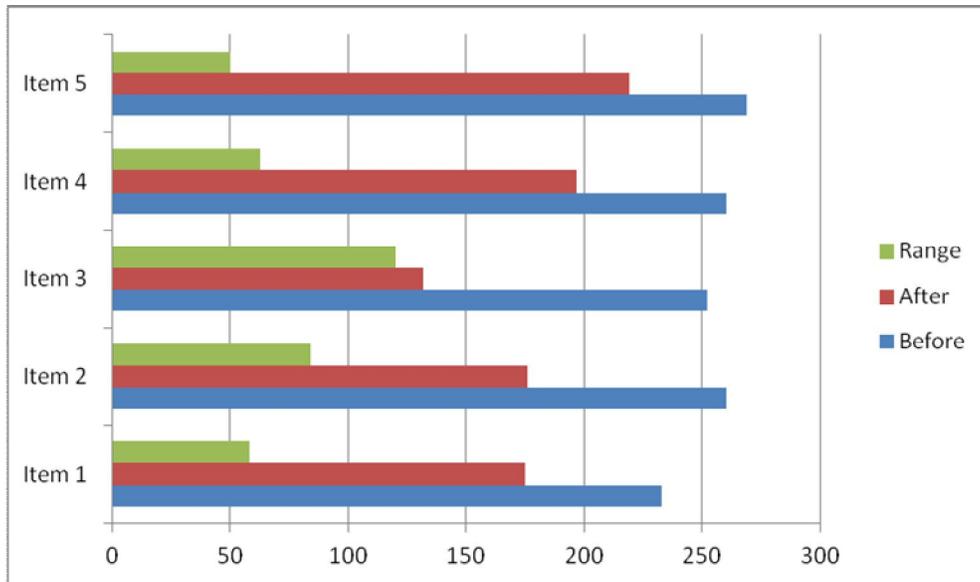


Figure 4. Diagram of Social Culture Change

Based on Wilcoxon Match Pairs test result on each item from 5 five research variable items, it can be seen that the component of each item experience significance change and can be described that there is difference in the aspect of social culture which relate to customs, culture norms and technology for forest resource management before and after the change and conversion of forest area into coal mining area, such difference on belief and taboos things in managing forest resource, ethics, and rules of forest resource management, technique and technology of forest resource management, practice and tradition in managing forest, soil and land. The major value change happens to variable item 3, which is condition of customs, cultural norms and technology of forest resource management and the minor change happens to variable item 5 concerning local wisdom and philosophy of forest resource management. Other change happen to the change of belief and taboos in forest resource management, ethics and rule of forest resource management, practice, and tradition of forest, soil and land management. The result of Wilcoxon Match Pair T-Test can be seen on the Table 4 as follows:

Table 4 The Result of Wilcoxon Match Pair T-Test toward the Condition of Social Culture of Village Forest Community

Item	Score			Wilcoxon Test Result		
	Before	After	Difference	Z	P-value	Description
Item 1	233	175	58	4.257	0.000	Significant
Item 2	260	176	84	6.096	0.000	Significant
Item 3	252	132	120	7.219	0.000	Significant
Item 4	260	197	63	4.481	0.000	Significant
Item 5	269	219	50	4.545	0.000	Significant

Source: Primary Data Processing, 2013

All changes in the community social culture condition lead to the change of adaptation which aims to survive in the condition where the biophysics environment and social economic experience change/transformation so that the change in social culture condition strengthen the theory rational act proposed by Max Weber which states that even though instrumental rational act is the fundamental key of certain individual act within community, social act can be seen as one act which relates to another act so that the behavior pattern of certain individual act can only be understood subjectively depending on the orientation, motivation and goal. Reed *et. al* [3] stated that the ability to adapt effectively with broad uptake is required where the adaptation strategy scenario must constitute synergy between poverty reduction and conservation of ecosystem service. Social culture factor will also influences the community choices toward adaptation strategy. However, the point is that the social culture change in coal based forest village community is an implementation of individual social act as quoted from Jhonson [12][13]; Arifin [18]. Besides, it also supports functional structural theory proposed by Parsons which states that the change in social dimension structure and economic structure will also cause the change in community social culture. Cultural system is part of those who maintain the pattern by providing norms and value that motivate actor to act, as quoted by Parsons, [8]. Phenomenon of culture mentality attitude also influence cultural social change in which there is an ability of individual in

understanding, interpreting and modifying the symptoms and symbols of socio cultural within the family and surrounding community through individual's mind and self. It is in line with interactionism theory proposed by George H. Mead which states that human act toward certain thing based on their sense on that thing. The sense derived from someone interaction with others then the sense is refined when the process of interaction take place, Blumer, as quoted by Paloma [19]. Meanwhile, other researches relating to community social change and conversion (of function) of land were conducted by Arifin [18] and Hatu [20]. Those researches are relevant with this research in illustrating social economic and social culture.

CONCLUSION

Based on the research objective, research result and discussion as stated on the pervious chapters, we can draw the following conclusion:

1. History, process and factors underlay the change and conversion of forest area into coal mining area were dominantly influenced by the role of authority structure and other strong external factors in determining forest village community.
2. Change in biophysics environment in the area around the forest village due to the change and conversion of forest area into coal mining area showed five indicators of biophysics environment change. The indicators were the availability of forest resource based on the wealth and diversity of flora and fauna of forest area, the condition of land and mixed gardening owned by forest village community, landscape condition, land and forest soil, condition of water sources/springs, water quality, dust and noise and also human built structure.
3. The change in social environment of village forest community due to the change and conversion of forest area into coal mining area showed change/transformation in social economy and social culture aspect. In terms of social economic aspect, it was also found social economic condition difference on the coal based forest area between the condition before and after the change and conversion of forest area into coal mining area. The difference condition of social economic consisted of condition of forest village community household economic condition and the roles of forest resource contribution to forest village community. There was also difference of social culture condition on the coal based forest village community before and after the change and conversion of forest area into coal mining area. Difference of social culture condition which were related to difference of customs, values, social culture norms and technology in connection with the ability to manage and control forest resource in traditional nature, such as forest ownership and communal rights on forest. Soil and water.

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