

Logging Moratorium, Timber Industry, and Community Participation in the Practice of Illegal Logging in Aceh

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Abstract: *Mortgage logging and timber industries are a dilemma. While illegal logging has become a major scourge in the destruction of forests in Indonesia, on the other hand the timber industry relies heavily on providing sufficient quantities of timber. This study aims to analyze the performance of the timber industry as an impact of the implementation of a logging moratorium, while simultaneously analyzing the factors that determine community participation in illegal logging activities. Research has been conducted in six districts in Aceh using surveys and focus group discussions involving investors, workers, and owners of timber processing units and forest supervisors. The results showed that the timber industry in Aceh had experienced a significant setback in understanding the forest ecology system, education, the main source of logging before and after the moratorium was to determine community participation in illegal logging activities. Therefore it is necessary to disseminate logging moratorium related to understanding forest ecology, as well as empowering livelihood for communities in forest buffer zones.*

1. Introduction

In an interactive discussion session entitled Forest for Peace and Well-Being: Towards a Brighter Future, Minister of Environment and Forestry in Jakarta June 2019, Siti Nurbaya, becomes one of the investigators; explained that Indonesia's forests are still the mainstay of the world as a source of oxygen.

Indonesia's forests are vast, even the third largest forest in the world after Brazil and Zaire.⁸ Based on official data first published by the Indonesian Ministry of Forestry in 1950, Indonesia's forest area was 162.0 million hectares.⁹ 7 (Otto Soemarwoto, 2001). However, over time, the size of Indonesia's forest area cannot last long. From year to year the total size of Indonesia's forest area published by the Indonesian Ministry of Forestry in the 1950s continued to decrease and experience shrinkage and damage where these conditions are often also referred to as deforestation.

The practice of illegal logging as if it cannot be stopped and continues to occur in all forest areas in. In addition, the production forest in the HPH concession is an easy area to do illegal logging in the name of permits. Areas such as protected forests or national parks are also the next target. Even used as a business area for unscrupulous bureaucrats and representatives of the people under the pretext of conversion to protected forests. (Kotijah, 2000)

The level of deforestation and forest degradation in Aceh has reached a point of great concern. In total, deforestation in Aceh reached more than 387,000 hectares during 2012-2017. However, the greatest deforestation occurred in 2006 which caused the degradation of Aceh's forests to worsen, reaching 1.87 million hectares, of which spread over 75% of conservation areas and protected forests, including in Gunung Leuser National Park. (Elfian Effendi. Greenomics. January 24, 2006)

The Aceh Forestry Service Report (2018) for forest destruction over the past five years (2012 - 2017) reached 27.12 percent. This means that an average of 5.4 percent of forest damage in Aceh is still ongoing. The determination of the Aceh government to fight the practice of illegal logging seems to be inexorable. This was realized by declaring the Logging Moratorium movement or the temporary suspension of logging in the Province of Nanggroe Aceh Darussalam on June 6, 2007. The policy of logging moratorium issued by the government only applies to large coking-cukong. While supervision of the community is not maximized. The government must have a people's economic empowerment policy to overcome this problem. For example jernang and rattan. In addition, it is also necessary to develop community plantation forests.

The formulation or concept of the logging moratorium policy was initiated by WALHI through the Regional Environmental Consultation Meeting (KDLH) held by WALHI on April 22, 2000 in Jakarta. 28 By definition, the logging moratorium or logging gap according to WALHI is to pause from logging and forest conversion activities. Interview with Syahrul Isman (Regional Executive of WALHI-North Sumatra) on 27 March 2009 The other definitions are freezing or temporary suspension of all logging activities large scale timber (industrial scale) for a certain time until a desired condition is reached. (Damanik, R.; 2009)

2. Research Methods

The research was conducted in six districts (Aceh Besar, North Aceh, East Aceh, Gayo Lues and South Aceh Districts). The six districts have very large areas as forest buffer. In addition, these six regencies became areas of forest encroachment operations and relatively many cases of Illegal Logging occurred.

The object of this research is community members who have been directly or closely involved in logging activities (pre or post the implementation of the logging moratorium). In general, these respondents were chosen into three categories based on profession / occupation:

- a) Logging sector businessman / worker; (1). timber industry owner / capital owner, (2). other logging / labor workers; and (4) processed / panglong timber traders,
- b) Formal sector / non formal forestry sector, or related to monitoring logging moratorium: (1). Forestry extension officers, and (2). uteuen handler / Imum Mukim.

While the scope of this study is limited to economic and social factors that are affected by the implementation of logging moratorium in Aceh in May to July 20014 until 2018. Sampling is based on their participation in illegal logging activities. All samples were carried out by purposive sampling because all of the above locations included forest buffer zones.

The analysis model used is multiple linear regression where there are a number of variables associated with one dependent variable (not free). If the independent variables in this study are X_1, X_2, \dots, X_6 and the dependent variable is Y , then the model and coficient regression forms which are the magnitude of the relationship between variables are as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \epsilon$$

Where :

Y = Illegal Logging Activities

X_1 = Age of Respondent

X_2 = Education

X_3 = Placement of workdays in productive / Illegal Logging sectors

X_4 = Level of Understanding of Logging Moratorium

X_5 = Contact Extension

X_6 = Government Funds for Community Empowerment

$\beta_1, \beta_2, \beta_3, \dots, \beta_6$ = Parameters Searched for regression coefficient

ϵ = Error

3. Results and Discussion

In general, young people who are less educated tend to not understand the purpose of this logging moratorium, let alone intersect directly with their main work. The main work as the main livelihood determines income and its dependence on consumption.

Therefore they tend to reject the understanding of this logging moratorium. However, there are significant variations in the experience of groups of community leaders and beneficiaries. This means that the group of respondents recorded in this study both capital owners, logging workers, timber traders / long-time entrepreneurs, and furniture entrepreneurs are mostly new players.

Some of the owners of this capital still carry out logging activities even though large-scale raids have been carried out throughout the Aceh. Most of them shift their business to other fields, with production structures that are far different.

In terms of diving, the owners of capital who divert their business are far higher than investors who still survive by means of cat-mouse and officers.

The results of interviews with 74 timber industry ventures in Aceh showed that the timber industry business experienced a very significant setback. The working capacity of timber processing businesses in Aceh after a five-year moratorium on logging decreased by an average of 12 percent, after ten years it declined 45.05 percent, and after more than ten years in 2018 the decline reached the lowest point of 10.65 percent. The performance of timber processing businesses before and after the logging moratorium has been implemented is shown in Table 1, below.

Table 1: Decreasing Business Performance of Timber Processing in Aceh After Logging Moratorium

Description	Unit	Start LM	> 5 years	> 10 years
Technical Indicator				
1. Timber Production	ton	8.635	3.640	920
2. Technical Capacity	%	87,2	42,15	10,65
Financial indicators				
1. Total Asset	IDR.000	181.335.000	76.440.000	19.320.000
2. Operasional Cost	IDR.000	5.526.400	6.406.400	2.060.800
3. Cash Flow	IDR.000	48.356.000	20.384.000	5.152.000
4. Profit	IDR.000	42.808.600	13.956.600	3.070.200
5. R/C		8,75	3,18	2,5
6. Return on Investment		7,75	2,18	1,49

Source: Aceh Forestry Service 2018; APKO 2019 (processed)

The result of the research shows that all timber processing indicators have decreased very drastically. In terms of financial indicators, timber processing businesses are still profitable for a small number of entrepreneurs who can survive. If at the beginning of the moratorium period there were still 383 timber processing businesses throughout Aceh, then in 2018 the remaining timber processing businesses were only 74 units. This business holds timber raw materials from community forest land or from production forests that are still left on community land. The timber raw material is very expensive, and the amount is also getting smaller. From the financial indicators, the timber extending business can still produce R / C of 2.5 and RoI of 1.49. Investment in timber processing businesses is still considered to be profitable, especially for furniture businesses, and property support industries.

Community Income

Community income is an economic indicator based on literature review that will determine its role in illegal logging activities and logging moratorium. Revenue as one of the variables that determines participation in illegal logging activities can be broken down based on the phases before and after the logging moratorium was enacted. Pre-moratorium income (X_4), and post-moratorium income (X_5) illustrate the community's participation in illegal logging activities. The results of the study show that there are

variations between groups of respondents and between sub-districts, as illustrated in Table 2 below.

Table 2: Average Income of Each Respondent Group in Each District

Respondent Group	Income at Pra LogginMortatorium (IDR/year)		
	Main Income	Side Income	Total
Timber Industry Owner	72,333,333	1,493,056	73,826,389
Logging Labors	41,000,000	8,338,889	49,338,889
Timber Owners	57,900,000	5,790,000	63,690,000
Average	55.058.333	10.197.153	65.255.486

In the period before the logging moratorium came into effect, the income of all groups of people from the main source of employment was far greater than the side jobs. For the owners of capital, the income from the main source of work is different from the logging laborers. The owner of capital is more focused on allocating resources and capital to the main job than on the side job. As for logging workers, the main job is to get a resource allocation that is almost the same as the side work. Even though then the income is far greater than the main job.

Furthermore, for owners of furniture and furniture entrepreneurs, the contribution of side jobs to total income in the pre-moratorium logging period is greater than the two groups above (Owners of Capital and Labor Logging). So that the contribution of income from his main job is smaller than the two groups above.

Forest Supervisor officer income and community leaders from their main work are still greater than from side jobs. However, the percentage of income contribution from side jobs is far greater when compared to the four groups above.

There is a variation in the contribution of income from each type of work. The difference in this contribution is certainly related to the allocation of capital and labor in each type of work. The contribution of the main work and side jobs to the income of the community groups after the moratorium on logging is also still very diverse. Nevertheless the contribution of the main work to the income of all community groups is still very dominant, as shown in Table 3 below.

Table 3: Average Community Group Income Detailed from Post and Main Work Post-Logging Moratorium

Respondent Group	Income at Post-Logging Moratorium (IDR/year)		
	Main Income	Side Income	Total
Timber Industry Entrepreneurs	43,556,667	2,986,111	46,552,778
Logging Labors	27,333,333	1,708,333	29,041,667
Timbers Owners	46,500,000	23,250,000	69,750,000
Average	48,112,269	11,946,373	52,866,975

After the entry into force of the logging moratorium there was a change in the composition of income of all community groups. In general there is an increase in the contribution of side jobs to the total income of the community. Meanwhile, revenues from logging, timber processing and trade have declined. After the moratorium imposed on the income of the owners of capital and logging laborers from its main

work, it decreased 1 to 20 percent, as shown in Table 4 below. For capital owners, logging workers, and long-time entrepreneurs there is a decrease in income from the main source of work. Whereas for furniture entrepreneurs, householders, and community leaders, there is an increase in income from the main source of work.

Table 4: Changes in Income of Respondent Groups from Main Income and Side Income After the Logging Moratorium was Enacted

Respondent Group	Marginal Income from Pre to Post-LogginMortatorium (Rp. / Year)		
	Main Income	Side Income	Total
Timber Industry Entrepreneurs	-28.776.666	1.493.055	-27.273.611
Logging Labors	-13.666.667	-6.630.556	-20.297.222
Timbers Owners	-11.400.000	17.460.000	6.060.000

This difference in income changes is due to changes in the working mechanism and the role of each of these community groups. The owners of capital and logging laborers who, before the logging moratorium were implemented, carried out activities more freely, and even many illegal activities were carried out so that their income was very high (above IDR 50,000,000 per year). However, after the logging moratorium was implemented, the volume of their activities was reduced, so that most of their income was smaller than before. Likewise with labor logging, before the logging moratorium was implemented their work volume was very high, so their income was quite high. However, after the logging moratorium was implemented, the volume of work decreased and their income declined. Long-term owners who are also associated with this logging activity, there is a decrease in work volume so that the decline in income from its main work is quite significant.

Understanding of Logging Moratorium

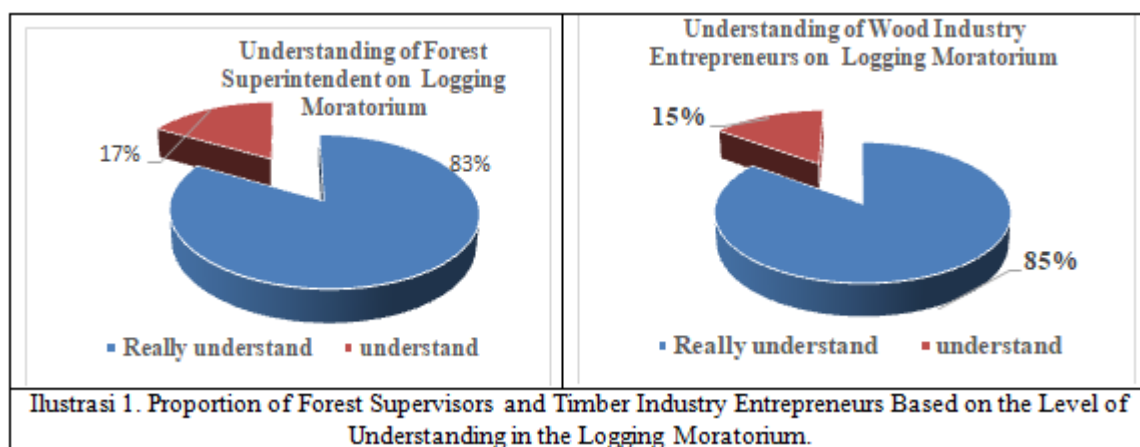
Understanding of logging moratorium is explained based on items submitted to respondents. As stated in the grand theory above, this understanding consists of 12 aspects, namely: four aspects of the form of legal and illegal logging activities, four aspects in terms of legal impact and four aspects in terms of environmental impact. These 12 aspects form the basis for determining respondents' understanding of Moratoium logging which is the object of the research. Based on the level of understanding each of them shows variation among groups of respondents, as shown in Table 5

Table 5: Levels of Understanding of Respondent Groups against Logging Moratorium

Respondent Group	Number of Respondents According to the Level of Understanding of Logging Moratorium		
	Really Understanding	Understanding	Do not understand
Timber Industry Entrepreneurs	63	11	0
Logging Labors	10	3	5
Timbers Owners	5	7	0
Forest Supervisor Officer	5	1	0
Total	83	22	5

Each group of respondents has a different level of understanding of the logging moratorium activities. This difference relates to the role of them directly and indirectly in logging activities, timber utilization and timber trade. Besides that the socialization factor carried out is also very closely related to the level of understanding of the respondent group. The more intensive the socialization of logging moratorium is, the more they understand the literal meaning and purpose of the policy. This is also understood by timber industry entrepreneurs as capital owners and logging workers. All timber industry entrepreneurs and logging workers understand, even 39 percent of timber entrepreneurs are very understanding, and 72 percent of logging workers also fully understand the logging moratorium. They are well aware that the logging moratorium aims to improve the quality of the community's environment, but some of them still question the compensation for the termination of logging against other

production activities. Thus their income does not decline sharply. This also applies to long-time owners and furniture entrepreneurs. Most of these respondent groups understand this logging moratorium. However, the decline in the volume of their activities greatly affected the income and welfare of their families. On the contrary, Paweng uteun, in fact most of them did not understand the concept and purpose of the logging moratorium. The handler in five sub-districts often even involved in illegal logging activities. However, community leaders are not involved in illegal logging activities. Although most community leaders still do not understand this logging moratorium, they are also involved in securing forests in their respective areas. Only a small portion of Pawang Uteun and this community figure understood some of the conceptions and objectives of the logging moratorium.



Ilustrasi 1. Proportion of Forest Supervisors and Timber Industry Entrepreneurs Based on the Level of Understanding in the Logging Moratorium.

The understanding of the logging moratorium is very closely related to the activities of their socialization and involvement in this counseling. The more intensively carried out counseling and the dissemination of security measures for logging moratorium, the more people understand it.

Extension and Extension Intensity

The socialization of the logging moratorium has been carried out by the government in Aceh, both through mass media and public education. In general, most people have participated in counseling conducted by related parties at least once. Only a small percentage of respondents have attended counseling more than twice in the past year

There are several reasons why they are very little involved in these extension activities, including: (a) feeling less important, (b) they feel disadvantaged, (c) consider this to be only temporary engineering. Some of the respondents considered this policy to be less important, because after the moratorium on logging was implemented they were still able to carry out their activities. They claimed that they often carried out illegal logging while evading the pursuit of the authorities. This is done to continue their business which is the main job. In addition, the price of timber after the logging moratorium came into effect increased by 200 percent. This is quite beneficial for capital owners and long-time entrepreneurs who are around the forest.

Participation in Illegal Logging Activities

Participation in illegal logging is measured by equity participation and community income contribution to the activity. The greater the capital included in illegal logging activities, the greater the role in these activities. Thus, on the contrary, the smaller the capital participation, the smaller the role in illegal logging activities. Equity participation in illegal logging activities can be measured by the amount of capital borne by the owners of capital and activity actors as measured by percentage. Likewise, the contribution of producers to illegal logging activities starts from logging activities in the forest, transportation, trade, timber processing and utilization.

The results showed that there were different roles for each community group and the contribution of capital and income for and from the activities of illegal logging, as shown in Table 6. The table shows participation in the form of equity participation and as the main source of income for the respondent group. For owners of capital, the participation as funders of illegal logging activities varies between 70 and 98 percent. The difference in the role of capital is determined by the factor of trust and the plan for sharing the results. The more trusted illegal loggers, the more courageous these funders provide capital to the perpetrators, whereas for new teams usually financiers are a little more careful. In addition, in this capital participation plan is also arranged for the distribution of income from this activity. The greater the capital included, the greater the income received.

Table 6: Participation of Respondents in Illegal Logging, Capital and Income Activities from Illegal Logging Activities

Peran	Equity Participation and Income Contributions (%)		
	Equity	Income	Total Contribution
Timber Industry Entrepreneurs	89.6	91.2	90.4
Logging Labors	91.1	83.3	87.2
Timbers Owners	62.5	70.9	67.9
Forest Supervisor Officer	-	-	-
Average	81,1	81,8	81,8

In the Table 6, the component with the greatest role in the activities of illegal logging is shown to be the owners of capital and logging laborers. The two components sometimes work very closely together. However, there were 14 respondents of timber workers who did not receive capital assistance during their activities. These logging workers use their own equipment, and are assisted by family members to carry out logging activities, transport timber and sell it themselves to log log traders. There are four timber workers who are fully funded by investors. These individuals hand over logging equipment and timber transportation equipment to their workers, then the spoiled timber is collected and then sold to the owners of furniture or furniture. The form of logs is sold to the owner of Pangang to be processed into broth or board. Whereas the form of crude broth and board processed in the forest is sold to furniture entrepreneurs.

Long-term entrepreneurs are often involved as financiers, so the financing component in illegal logging activities increases. Long-time owners provide tools timber cutters and timber transportation equipment to timber workers to then get the spoiled timber collected by the Pangang owner.

Participation factors in Illegal Logging

The logging moratorium was implemented two years ago, but logging, timber processing, utilization of timber products and timber trade in Aceh are still ongoing. Therefore in the formulation of the problem this study sets out six variables that determine the participation of the community in illegal logging activities. The results of the study show that there are significant coefficient factors that determine participation in illegal logging activities as shown in Table 7

Table 7: Coefficient of Determinants of Participation in Illegal Logging Activities

Variable	Coefficient		t	Sig.
	B	Std. Error		
(Constant)	96.293	15.068	6.39	0
Age of Respondent	-0.133	0.305	-0.435	0.665
Education	2.625	0.856	-3.066	0.003
Placement of workdays in productive / Illegal Logging sectors	-0.354	0.239	-1.482	0.145
Level of Understanding of Logging Moratorium	0.328	0.154	2.13	0.004
Contact Extension	-0.057	0.762	-0.075	0.941
Government Funds for Community Empowerment	-0.153	0.037	-4.135	0.000

In the form of a determining factor regression equation participation in illegal logging activities can be written as follows:

$$Y = 96,293 - 0,133 X_1 + 2,625 X_2 - 0,354 X_3 + 0,328 X_4 - 0,057 X_5 - 0,153 X_6 + \epsilon$$

with $R^2 = 0.639$, meaning that 63.9 percent of the variation found in community participation in illegal logging activities is determined by the six factors above. While the other 36.1 percent is determined by other factors outside the model. Thus there are still many other factors that should be analyzed to examine the determinants of illegal logging. The correlation coefficient $R = 0.799$, meaning that the relationship between the ten independent variables above and illegal logging activities is 79.9 percent. This is very real correlation between the independent variable and the dependent variable. Simultaneous testing shows that the above equation is very meaningful as shown in Table 6 below.

Table 6: Analysis of Variance and Coefficient of Regression

ANOVA ^b						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8941.205	9	993.467	9.82	.000 ^a
	Residual	5058.435	50	101.169		
	Total	13999.64	59			

Partially, it can be seen that only four out of ten factors significantly affect the participation of respondents in this illegal logging activity. It is a significant factor for you: education, pre-moratorium logging and income after logging moratorium, and their level of understanding of this policy. Education is very important to capture the messages in the logging moratorium policy. The higher the education, the more they are aware of the logging moratorium, so that their participation in illegal logging activities is getting smaller. On the contrary, the majority of respondents who have low education are less aware of the logging moratorium policy. Therefore the lower the education the greater the participation in illegal logging activities.

The variable level of respondents' understanding of the logging moratorium (X9) is the fourth variable that has a significant effect on their participation in illegal logging activities. The higher the level of understanding, the smaller the participation in illegal logging activities. The understanding of the moratorium explained to respondents includes ecological, legal and economic aspects. Implementing a logging break to provide opportunities for forests to provide sustainable results without reducing ecological and economic benefits. Respondents who were aware of the meaning and purpose of this moratorium significantly reduced and even partially stopped this involvement in illegal logging.

Discussion of the determinants of participation in illegal logging activities based on the ten variables above are based on the theories discussed in the literature review. Communities around the forest in the six sub-districts above are familiar with the condition of the forest and are tied to their livelihoods. Therefore age, education, length of work in logging activities, pre and post income logging moratorium, availability of family labor, family consumption, understanding of the logging moratorium and the intensity of

counseling that were followed were thought to determine their participation in illegal logging activities. Illegal logging activities carried out by communities around the forest in these six sub-districts, according to them, are legal. Forests were created to support their lives, and they felt they had the right to earn a living from these forest products. Therefore the above factors are dominant, and some are not significant in influencing their participation in logging, processing, utilization of timber products and trade. So far, many socialization activities have been carried out starting from the procurement of leaflets, brochures and appeals through mass media, to counseling to the public. However, the intensity of counseling shows no significant effect on illegal logging activities. This means that the outreach and extension activities carried out have not been effective.

To ensure a logging moratorium can take place, the four determinant variables above can be used as performance indicators. Public education about ecological aspects, efficient use of timber and legal aspects of illegal logging can be included in community education materials. Another effort is to organize community empowerment to improve their livelihoods, utilizing forest products other than timber. Revenue is an important factor for controlling deviant behavior from a legal, economic and ecological perspective. Therefore the North Aceh Regency government must focus on the economic empowerment of the surrounding forest communities to support this logging moratorium policy.

4. Conclusions and Suggestions

The implementation of the Logging Moratorium has had a significant impact on the economy of the forest buffer zone community in Aceh. After the moratorium on income logging, the people who have had a livelihood in forest products have decreased significantly.

Two of the six factors that significantly influence the participation of respondents in this illegal logging activity. It is a significant factor for you: education, pre-moratorium logging and income after logging moratorium, and their level of understanding of this policy. Education is very important to capture the messages in the logging moratorium policy. The higher the education, the more they are aware of the logging moratorium, so that their participation in illegal logging activities is getting smaller. On the contrary, the majority of respondents who have low education are less aware of the logging moratorium policy. Therefore the lower the education the greater the participation in illegal logging activities. The variable level of respondents' understanding of the logging moratorium (X5) is the fourth variable that has a significant effect on their participation in illegal logging activities. The higher the level of understanding, the smaller the participation.

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