Rural Livelihood Strategies in Sumatra After the Implementation of ‘ASEAN 2020 Haze Free Policy’ (Case Study: Lebung Gajah Community, Ogan Komering Ilir, South Sumatera)

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Abstract. A series of regulations to realize ‘the ASEAN Haze Free Policy in 2020’ have been made, starting from the international level to the local level, including the ban on the use of fire for traditional agricultural land clearing (sonor) that was commonly used by rural communities in Sumatra. This study analyzes the livelihood strategies of rural communities after the issuance of the policy. The data used are primary and secondary. Primary data were collected through interviews, FGDs, and field observations in June-August 2019 at the district level (Ogan Komering Ilir District), community and member of the community (household) in Lebung Gajah Village, Tulung Selapan Sub-District. On the other hand, the secondary data were conducted during January-September 2019. Analysis conducted using the Scoones' Sustainable Livelihood Approach found that to ensure the sustainability of their livelihoods, various households in the rural community carried out strategies: (1) agriculture intensification (‘Kebun Pangan Mandiri Program’), (2) livelihood diversification (raising livestock, catching fish, building swallow houses, & becoming construction worker), and (3) activating women's groups (household financial and business management). In implementing their strategies, they exchange their access to livelihood assets that are owned and available through social institutions and formal organizations in the village.

1. Introduction
The problem of the impact of haze due to forest and land fires (karhutla) becomes an important issue in the international world because it has the potential to cross national borders and disrupt economic, social, and ecological stability for Indonesia and other countries [1]. The worst forest and land fires in Indonesia occurred in 2015 with a total area of 2,611,411.44 hectares burned or around 69.2% of the total area of fires in the 2014-2018 period [2].

In October 2015, the Government of the Republic of Indonesia issued an official policy document in the form of Presidential Instruction (Inpres) No. 11 of 2015 concerning Improvement of Forest and Land Fire Control [3]. The policy was issued after the government ratified the approval letter in the
form of AATHP (ASEAN Agreement on Transboundary Haze Pollution) which had been agreed by all ASEAN members [4]. It is followed by the formation of the Minister of Environment and Forestry Regulation (PermenLHK) No. P.32/MenLHK/Setjen/Kum.1/3/2016 also Regarding Forest and Land Fire Control [4].

According to data published by the Ministry of Environment and Forestry, eight provinces are classified as fire-prone areas, one of which is South Sumatra [2]. The determination indicator is carried out by taking into account the number of hotspots and the total area of forest and land burned in the area. The total area of forest and land burned in South Sumatra Province in 2015 was 648,298.80 hectares [2]. Following the problem, the Government of South Sumatra Province issued South Sumatra Province Regional Regulation No. 8 of 2016 concerning the control of forest and land fires as well as strict sanctions contained in article 17 paragraph 1 against arsonists in the form of imprisonment for a maximum of 6 (six) months or a maximum fine of Rp.50,000,000.00 (fifty million rupiahs) [6].

The series of policies have made the community especially in rural areas depressed. Similar conditions were experienced by rural communities in OKI Regency. OKI (Ogan Komering Ilir) is a district that has the largest peatland forest in South Sumatra Province reaching 1,923,347 Ha [7]. Generally peat soils have carbon concentrations ranging from 30-70 g/dm³ or 30-70 kg/m³ or equivalent to 300-700 t/ha/m [8] which makes fires difficult to extinguish. OKI Regency is also the largest contributor to the smog in South Sumatra Province with the number of hotspots during June-November 2015 reaching 10,581 points [9]. This condition is caused by the community who use the burning method for land clearing. This method has become local wisdom for the communities in OKI Regency that are called sonor.

According to the livelihood framework of Chambers and Conway [10], Scoones [11, 12], DFID [13], to be able to sustain livelihoods in an ecologically vulnerable area the capacity of the community to adapt is needed to recover from pressure. The framework provides flexibility for community elements in reducing vulnerability by utilizing five forms of capital as livelihood assets, such as social capital, natural capital, physical capital, financial capital, and human capital.

Due to differences in capital ownership by rural communities, households are classified into several social layers [14]. Households belonging to the upper layers are those who have extensive land, side jobs, and ownership of complete and quality livelihood assets. Households that do not have assets, but need them, can still access these livelihood assets through social institutions or organizations in the village. The institution was held to regulate the use of various livelihood assets. The more livelihood assets that can be utilized, the more livelihood adaptation strategies can be implemented.

Scoones [11, 12] grouped livelihood strategies by rural households into three groups, namely (1) agriculture, (2) diversification of non-agricultural livelihoods, and migration. Each livelihood strategy is carried out through various livelihood activities by household members. Therefore, most households implement more than one livelihood strategy. Livelihood strategies that are able to be carried out will produce outcomes that can create sustainable livelihoods. Indicators of the realization of sustainable livelihoods can be seen from (1) income, (2) community welfare, (3) livelihood adaptation (4) food security, and (5) sustainability of natural resources.

From the background description above, the objective in this paper is to find out the livelihood adaptation strategies undertaken by households from various layers in ensuring livelihood sustainability amidst the ecological vulnerability of their villages after the establishment of ASEAN Haze-Free policies.

Thus, this paper was made to provide an overview of livelihood adaptation strategies undertaken by the Lebung Gajah community. The goal is that the Lebung Gajah community can become a model and also be implemented for other regions that have similar pressures. It is expected that the intended
conditions can run smoothly so that the ASEAN Haze Free 2020 target can be achieved and sustained. Furthermore, communities that have adaptive livelihood capacity can collaborate with the government to achieve sustainable development targets [15].

![Research Framework Scheme](image)

**Figure 1. Research Framework Scheme** (Adapted from Scoones, 2009)

2. Methods

This paper uses case studies as a method through a qualitative approach in community and also household level (as a member of the community). Data collection uses observations, semi-structured interviews, and focus group discussions (FGD). Descriptive analysis through Scoones’s Sustainable Livelihood Approach is used for data analyzing techniques. Semi-structured interviews were conducted with the Head of the Lebung Gajah Village, the Head of Project Management Unit of the Peat Cares Village of the South Sumatra BRG Partnership, the Village Facilitator, the Head of Physical and Infrastructure Division of BAPPEDA OKI, the Head of Daops III Manggala Agni OKI, and the Planning Staff of the Plantation and Animal Husbandry Office.

Informants were collected through an oriented snow-ball sampling method to obtain information based on the perspective of the actors, taking into account their abilities and ways of processing information. Data collection using this method is stopped when the required information collected
from key informants is considered sufficient and saturated. Collecting the primary and secondary data was carried out for four months starting in May-August 2019 and analysis the data was carried out in September 2019 by means of 1) interview transcription 2) extraction of transcription results, 3) analyzing the results, and 4) drawing conclusions.

To clarify the validation of the information obtained from the informants, FGD was conducted for validating the data from informants. The participant of the FGD consists of the Lebung Gajah community, represented by several members of the community from every profession in the village, including farmers, local capture fishermen, breeders, and representatives of women's groups and young women. To maintain validity, member checks and reliability tests are conducted by auditing the results of the study. Complementary data were obtained through field observations and document analysis.

3. Results and Discussions

3.1. Ecological Vulnerability of Research Sites
Lebung Gajah Village is one of the peatland villages which is prone to forest and land fire disasters. The village, located in Tulung Selapan Subdistrict, has an area of 105.22 km² [14]. Based on observations, Lebung Gajah Village consists of low-lying areas and swamps dominated by community rubber plantations. So that the majority of the community members earn a living as rubber tappers and farmers with sonor techniques.

Most community members now only have the main income as rubber tappers. The pressure felt after the prohibition of burning forests by the Lebung Gajah community came from the difficulty of the community in rejuvenating rubber that is getting old with sonor techniques so that their income decreases. According to Scoones's Sustainable Livelihood Approach conditions, this caused the Lebung Gajah community to experience economic shocks because a series of regulations concerning the prohibition of burning forests and sanctions caused the community livelihood to decrease dramatically.

The ecological vulnerability of the Lebung Gajah Village to forest and land fires is increasing because based on observations that have been made, the morphological condition of the Lebung Gajah Village area is dominated by peat soil. After a series of enforcement of ASEAN HazeFree policies, the Lebung Gajah community were forced to abandon their sonor culture to reduce the risk of forest fires and implement the ASEAN Haze Free policy being implemented.

The conflict between the village community and the company that has entered the area of Lebung Gajah Village also affects the level of ecological vulnerability of the village location as a form of conflict shock that affects the ease of access to resources in the village. In addition, the change of seasons also affects the level of ecological vulnerability in the village of Lebung Gajah especially in agricultural production activities. In the past, when the dry season came it was usually done planting rice with a sonor system followed by spreading rice in the burned area. Whereas in the rainy season, the community cannot plant at all because the swamp area is inundated by water. Usually before the community's land has not been controlled by the company in the rainy season the community catches local fish.

3.2. Livelihood Assets and Their Access
Based on the results of observations made by researchers that the natural capital owned by Lebung Gajah Village is mostly peatlands that are used for rubber management as a source of community income. While social capital owned by the Lebung Gajah community can be seen from the division of gender roles in carrying out household activities, for example women in charge of planting and watering gardens in managing garden land, while men are tasked with finding water to water gardens.
Each household has different livelihood assets depending on its capital. This difference makes households classified into several layers. The more land owned, the more additional work done, and the higher the household economy, the higher the level of social coating of the household. For this reason, there are four social strata in Lebung Gajah (1) the upper layer, (2) the middle layer, (3) the lower layer of the owner, and (4) the lower layer of labor.

The upper layer households, apart from being cultivators of their rubber land because they have rubber land, also rent out their land to work on other households and households for owning additional businesses, ie swallow houses. Some middle-income households work as cultivators of their rubber land as well as traders and some work as breeders as well as tapping workers in other households' rubber fields. Households under the owner only work as rubber farmers own land without any additional work. The lower classes of labor are those who only work as tapping workers in rubber land owned by other households. The harvest from the rubber and swallow business will be deposited to the "middlemen" of rubber and swallow which will be marketed in Palembang because market access in the village of Lebung Gajah does not support the transaction of buying and selling rubber and swallow saliva.

Construction of swallow houses by some households that have sufficient economy as additional income is a form of adaptation strategy undertaken by the Lebung Gajah community in dealing with government policies regarding the prohibition of opening land on fire. The construction of the swallow house was prepared by the community because they were concerned that the rubber land as the main income asset could not be rejuvenated due to the difficulty of opening the rubber land without burning.

3.3. Rural Livelihood Strategies

Prohibition of burning forests and strict sanctions set in Indonesia, making community shocks in rural areas such as the Village of Lebung Gajah who are very familiar with its sonor culture. This condition also forced the Lebung Gajah community to adopt a number of livelihood strategies, namely by intensifying agriculture, livelihood diversification, and activating women's groups.

Agricultural intensification is an effort to narrow land use by maximizing management without increasing the land area and increasing the number of workers. Agricultural intensification carried out in the village of Lebung Gajah utilizes natural resources (such as land, water, air, etc.), human resources (such as capabilities and knowledge), physical resources (such as granaries or storage areas for agricultural products). This agricultural intensification is realized by developing the Independent Food Plantation Program.

Independent Food Garden is one of the programs carried out by the South Sumatra BRG Partnership to improve livelihood conditions in the village of Lebung Gajah after the establishment of an ASEAN Haze Free policy. The Mandiri Food Garden has been planted since April 2019. Commodities planted are types of short-lived plants, such as vegetables, medicines, and fruits. The results of the Mandiri Food Plantation production will later be used by the community for their consumption and more for sale or to be developed back into seeds to plant in subsequent periods.

Another livelihood adaptation strategy undertaken by the community in order to meet their daily needs is to switch professions such as those who used to work as rice farmers, rubber farmers, and local fishers turned into laborers and construction workers.

After the establishment of the ASEAN Haze Free policy, most of the land in the village of Lebung Gajah which was previously only used as a rubber land is now available for the swallow house construction. The swallow house that has been built is a physical capital owned by the Lebung Gajah community as one form of adaptation to increase income after the establishment of the ASEAN Haze Free policy. The sale of saliva swallow is used by most community members to meet their needs and continue their livelihood.

Not quite up there, the development of social capital was also developed by the Lebung Gajah community by reactivating women's groups and involving women to work to find a source of livelihood. Currently, women and young women have begun to actively participate in counseling about efforts to reduce the number of household expenses by growing all kinds of vegetables, fruits,
and spices around their yard. So far many women and girls have implemented the method in their homes by creating their garden behind the house as a form of women's involvement in helping the head of the family continue their livelihood in the Lebung Gajah Village. The moderator in the FGD also said that in the village of Lebung Gajah there was a division of tasks in the management of the Independent Food Plantation such as mothers whom water plants and fathers fetch water. Such involvement of women is very positive because it can ease the burden of meeting household needs.

The strategies undertaken are also in accordance with the theory of livelihood in the concept of sustainable rural livelihood framework, namely by combining a variety of resources such as natural resources, human resources, financial resources, social resources, and physical resources, so as to reduce risk and vulnerability (vulnerability) by continuing to implement the ASEAN Haze Free policy or other vulnerability context using livelihood adaptation strategies to produce good livelihood outcomes.

3.4. Livelihood Outcomes
The existence of additional income apart from the agricultural sector will affect the increase in community income and their welfare after the establishment of the ASEAN Haze-Free policy. When compared to the income earned by the Lebung Gajah community from the establishment of ASEAN Haze Free policies up to now have gradually increased from the livelihood adaptation strategies undertaken by the community.

The increase in income experienced by the community after the establishment of the ASEAN Haze Free policy up to now has had an impact on the welfare of the community (and members) who are also increasing. Based on the theory of the Human Development Index [13] that public welfare is seen from three aspects called the basic dimensions of the HDI (Human Development Index), namely education, health, and welfare (income).

Based on the results of observations made that in the field of education Lebung Gajah community has 2 PAUD (kindergarten) and 2 SDN (state elementary school). Based on observations also that the majority of the member of Lebung Gajah community has realized the importance of formal and non-formal education such as religious education, and there has been a desire by parents to send their children to a higher level even though there are parents who still think that school is expensive and not useful especially for women who end up working in the kitchen. In the field of health itself, the Lebung Gajah community has one poskesdes (village healthy center), one auxiliary poskesdes, and one posyandu (local integrated health center). The condition of poskesdes is quite good although it still needs treatment. In the poskesdes, oxygen and masks are available to anticipate the haze caused by forest and land fires. The community itself usually goes for treatment by calling health workers to the patient's house or buying medicines at the food stall or in the midwives' homes. This has shown that there is already public awareness about the importance of education and health.

Income gained by the community from the enforcement of ASEAN Haze Free policies has so far increased even though the increase is not too significant. In the early years after the establishment of the ASEAN Haze Free policy, the community was experiencing a crisis of income and output. To meet the needs of household life such as vegetables and fish, the community must buy from traders with declining income. Decreased income and increased expenditure. The following is a table of average monthly income for the member of the Lebung Gajah community after the adoption of a livelihood adaptation strategy (see Table 1).

| No. | Main Livelihoods       | Additional Livelihoods | Average monthly income |
|-----|------------------------|------------------------|------------------------|
| 1.  | Rubber farmer          | Swallow business       | Rp6.000.000            |
| 2.  | Rubber farmer          | Merchant               | Rp4.000.000            |
3. Breeder Tapping laborers Rp3,000,000
4. Rubber farmer Tapping laborers Rp2,000,000
5. Tapping laborers Housewife Rp1,500,000

4. Conclusions
The main highlight of this paper is to show that there is a solution to adapt to the ecological vulnerability in an area, namely by adopting a livelihood adaptation strategy. If the implementation of this strategy is carried out properly and correctly, it can improve the welfare of rural communities and prevent the risk of forest fires caused by human activity. It is also hoped that this paper can inspire other fire-prone areas so that the ASEAN Haze-Free 2020 target can be achieved and is sustainable.

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