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Household vulnerability located on land conversion for palm: Case study of pinrang sub-district, wajo district, South Sulawesi

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Abstract. The development of oil palm plantations has pushed for massive land-use change in Indonesia. As is the case in Penrang District, Wajo Regency. There is approximately 1,700 ha of agricultural land converted to oil palm plantations of 18,000 ha of land to be developed. The transformation of agricultural land into a palm oil plantation area with a partnership system has an impact on the limitations of the community in managing and accessing land owned by it. Farming activities for both rice and other commodities such as cashew and others and cattle grazing activities cannot be done on agricultural areas that have been planted for oil palm plantation. This condition triggers a shock to the livelihood system of farm households. Therefore, this study aims to analyze the vulnerability process and how communities conduct livelihood strategies to restore economic conditions and household livelihoods. This study used snowball sampling and in-depth interviews in two villages namely Temmabarang Village and Taddangpalie Village, Penrang District. The results of the research indicate that some farmers' households are vulnerable due to land conversion in the form of work accidents when they become oil palm laborers (shock), decreasing activities to access, process and take yield after conversion of land, and vulnerability due to loss of livelihoods in certain seasons (seasonality). Vulnerability in the form of shock, trend, and seasonality is overcome by two types of strategies, namely survival strategy and consolidation strategy by relying on human capital, social capital, natural capital, and financial capital.

1. Introduction

The expansion of oil palm plantations is an inevitable phenomenon, especially with the opening of a vast market for these commodities. Oil palm plantations in Indonesia increased from about 300 thousand ha in 1980 to approximately 15.9 million ha by [1]. The increase in the area of oil palm plantations in Indonesia is due to the increasing growth of the palm oil industry at the global level over the past few years. For tropical countries including Indonesia, palm oil cultivation is one of the main alternatives to the economic drivers in addition to the oil and gas sector[2,3].

In the past, the area of oil palm for self-sufficient farmers was far less than the area of state and private plantations. The state still controls the field of oil palm plantations by 68% of the total area of oil palm plantations in Indonesia. From year to year, the area of oil palm plantations owned by private and self-farmers increasingly dominate than the area of the plantation of state-owned palm. Even in 2013, the area of private plantations already controls 51% of the total area of oil palm plantations in



Indonesia and 42% the land is controlled by independent farmers[4]. Palm oil-based industries contribute substantially to economic growth, poverty alleviation, and improved income distribution. The development of oil palm has a positive impact on economic growth as indicated by the growth in investment, output and foreign exchange, rising household incomes, increasing access to social infrastructure/services, and increasing land values[5]. The palm oil industry has a significant contribution to the welfare of households. Also, palm oil also provides employment opportunities for the community. The number of workers absorbed by the oil palm plantation industry was 7.3 million people in 2013, rising to 7.9 million by 2015 [6].

Behind these positive impacts, it can not be denied that the presence of oil palm plantations also has a negative effect on environmental conditions, where when environmental damage occurs, local communities surrounding the plantations will experience vulnerability. In addition to changing agricultural systems, the presence of palm oil also leads to deforestation, loss of food crop area, reduced biodiversity, and most importantly the community loses access to manage and utilize the yields of the land [7,8].

Wajo Regency is one of the areas in South Sulawesi Province (Indonesia) which in the last six years convert agricultural land into oil palm plantation. Based on the recommendation of Wajo Regency government, the area that can be developed for oil palm plantations is $\pm 18,000$ ha. Already about 1,700 ha of agricultural land converted to oil palm plant. The partnership is a pattern offered by the company to the community to participate in oil palm plantation activities. In this pattern, the procurement of oil palm is not through land acquisition, but the people give their land to the company in the form of right of business with a certain agreement.

Land acquisition by the company affects the changing of people's livelihood. In general, the community in the research location has a livelihood as farmers by utilizing the surrounding land (58.09%). The results of the previous studies found that changes in the ecological landscape from forests to oil palm plantations put significant pressure on the social aspects of society in the form of bundles of rights, land tenure, land tenure structures, non-agricultural livelihoods, and community cohesiveness [9].

Oil palm plantations in Penrang District affect local livelihood strategies. The magnitude of the influence on local livelihood strategies depends on how much local people can survive and use the livelihoods that palm plantations provide. Every household as the smallest social unit within people are required to be able to face (coping) and adaptation with various stressors and shocks, and maintain their livelihood capabilities and assets by implementing various livelihood strategies that ensure their livelihoods and future generations [10]. Livelihood strategies are an option formed by assets, access, and activities that are influenced by the capability of a person or household to do so[3,11]. Activities, assets, and access are closely linked to structures and processes that show a dynamic relationship in the choice of livelihood strategies. The livelihood phase into three sections, the survival strategy phase, the consolidation strategy phase, and the accumulated strategy phase [12].

Based on the phenomenon that occurs, this study aims to analyze the context of vulnerability in the form of stressors and shock faced by the community as a result of conversion from agricultural land to oil palm plantations in the District of Penrang Wajo. Also, this study also intends to analyze community livelihood strategies in meeting household needs after conversion of agricultural land to oil palm plantations.

2. Methods

The research was conducted from December 2017 to May 2018 in TaddangPalie Village and Temmabarang Village, Penrang District of Wajo Regency. The location was chosen because this area was set by the Wajo Regency government as the area that converted agricultural land into oil palm plantations.

The unit of analysis (informants) is a farm household that converts agricultural land into oil palm plantations. Determination of informants is done until the saturation point that is no longer appear new answers from informant through snowball system (snowball).

Data collection is done by collecting primary and secondary data. The instruments used are observation, in-depth interview and document study. The interview process is structured to explore information on the impact of conversion of agricultural land to oil palm plantations on vulnerability and household livelihood strategies.

The data analysis was done by using the shell work of life and the framework of livelihood through the following stages: 1. Review all data obtained by reading, studying and understanding it; 2. Reduce data using abstraction (analyze and summarize the essence of data); 3. Prepare data and unit or classification; 4. Units are categorized while coding; 5. Check the validity of the data. Data processing is done by triangulation method by comparing the secondary data, interview data dan data observation result [12,13].

3. Results and Analysis

3.1. Vulnerability Context

Tadangpalie Village and Temmabarang Village are villages in Kecamatan Penrang that convert agricultural land into oil palm plantations. Approximately 600 ha of rainfed and dryland rice fields are converted into oil palm plantations. The land is partnered with a 40% profit sharing system for farmers and 60% for the company. This partnership system will be established for more than 25 years. The process of land acquisition to the planting of oil palm seedlings has been conducted since the end of 2011. After entering the sixth year, people have not been able to enjoy the results of palm oil. Communities experience some life adjustment in waiting for the harvest. Change makes people face some pressure (stressor). Pressure will encourage people to become more vulnerable to fulfilling their household livelihoods. The context of vulnerability (context) refers to a vulnerable or latent situation that can influence or bring about major changes in the livelihood of society at any time [14]. Vulnerability analysis is important to recognize the various pressures and build awareness that shocks, trends, and seasonality are so great for one's sustainability.

There are three types of vulnerability context in progress. First, households are vulnerable to meeting the needs of life due to shocks. Shock (shock) is a sudden and unpredictable change, its influence is relatively large for livelihood, destructive or destructive, and generally felt directly. There are two households (10%) who are shocked by work accident after working as palm oil workers. Case 1, the household loses its source of livelihood because the head of the family is permanently disabled due to an accident. Decreased revenues that impact on meeting the needs of daily living. Case two, heads of households find it difficult to earn a living because of the declining health of heavy work in oil palm plantations, so that household needs are difficult to meet.

Second, households experience stressor due to trend. Trends are slow changes that are generally predictable, but there will be negative impacts on people's livelihoods if they fail to be properly anticipated. After the oil palm plantations, some households experienced a decrease in activities to access, process and retrieve the results. The tendency of households to convert rice fields to make life more poor and difficult to meet their food. This condition is experienced by 15 households (71%). Land that used to contribute food to households (subsistence farmers) can not currently be accessed, processed and taken. Case 1, the household that has converted the land, has no other assets, old age, no children, and husband so that it is difficult to meet the food needs. There are two households experiencing such things. Case two, households have sufficient assets, but restrictions on access to land leave them with a place to graze cows and buffalos, so they sell almost all of their animals. 13 households were experiencing similar cases.

Third, vulnerable households due to seasonal pressures. Seasonal changes are periodic and often occur in a certain period. Although predictable, it generally has an impact on people's livelihoods. The impact is more widespread than the ability to anticipate the community. Households that convert their land to work as palm oil workers when the dry season comes are examples of cases in this type. Currently oil palm plantations in the maintenance phase then the company does not require a lot of

workforces. With no community working in the palm plantation some households have difficulty earning a living in the dry season. There are four households (19%) experiencing such conditions.

Conversion of agricultural land into oil palm plantations is an event that can threaten and disrupt people's livelihoods. Working accidents, reduced access to land, employment opportunities, and asset sales resulted in communities making some livelihood strategies to keep their household lives going.

3.2. *Strategies in Facing Vulnerability*

Various types of vulnerability can be identified after communities convert agricultural land into oil palm plantations. The vulnerability facing households requires strategic action to achieve their own life goals. This is paralleled that livelihood strategies are careful organizing or planning activities in responding to careful life changes to achieve desired targets or goals [14,15].

The household livelihood strategy of farmers before conversion involves three types of survival strategy, consolidation strategy and accumulation strategy by agriculture. In addition to agricultural bases, there are other bases such as livestock, trade, carpentry, plantation.

Before conversion, survival strategies had the largest percentage of 20 households (61%), followed by consolidation strategies of nine households (27%), and the smallest percentage of cumulative strategies of four households (12%). All types of both survival, consolidation and cumulative are dominated on an agricultural basis. This is by the condition of Wajo Regency which is one of the areas of rice granary in South Sulawesi.

The livelihood strategy of the community after land conversion has changed, the consolidation strategy has increased the percentage to 40%, four households are moving from the survival strategy to the consolidation strategy. Agriculture and livestock become their livelihood base. While households with a survival strategy slightly decreased from 20 households to 16 households (48%). Households with fixed accumulation strategy in four households (12%). The basis of work on this strategy is agriculture, livestock, trade, community leaders (village heads and village heads).

3.3. *The Accuracy of Strategies in Resolving Vulnerability*

The results of the strategy accuracy analysis in overcoming household vulnerability after converting land are shown in table 1 as follows:

Table 1. Strategy accuracy analysis in overcoming household vulnerability after converting land

Vulnerability Context	Livelihood strategy	Strategy Accuracy Analysis
Shock (shock): Head of the household experienced work accidents when a palm oil worker.	The role of the head of the household is replaced by his wife and other family members to fulfill the household's living.	The work of family members is the right decision to replace the head of the household in earning a living to meet the needs of life.
Trends: Households have decreased activity to access, process and retrieve the converted land yields.	Case 1: Households ask for help from their families and main neighbors for food needs, because he has no other assets, age is old and has no husband and child.	Hoping for help from family or neighbors is an effective strategy to continue life because the household has no assets that can be sold, and the age is not productive anymore to work.
	Case II: Household sells all buffalos and cows for losing a place for shepherds, sales proceeds kept for daily needs, tuition fees and partial to the child for a business capital/wander	Selling whole livestock is less effective because selling large quantities of livestock at unneeded times causes households to lose their natural capital as long-term investments.

Seasonality (seasonality): Household loses its livelihood in certain seasons	Some households are looking for non-agricultural employment (construction workers, labor market, wanderers, trading), some of their wives help the economy by weaving, some are selling 1-2 cattle /buffaloes.	Diversification (diversification), migration, and selling of assets is the right strategy to be done by households to anticipate the livelihood of a seasonal nature.
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The implementation of livelihood strategies in addressing vulnerability varies greatly. Farm households not only use the agricultural sector to meet the needs of life but also utilize the non-agricultural sector. Stages in continuing life through a different system of living.

Shocks (shocks) that are sudden and unpredictable changes have a profound effect on livelihood and are destructive or destructive. Generally can be felt directly. When a situation like this happens, the right strategy to do it with a survival strategy. The strategy is done in various ways to survive, all the results obtained are used to meet the minimum life needs of food[10]. The same thing is expressed that survival strategy as a form of business subsistence, that is as a strategy or art of survival to simply meet the needs daily [16].

Once a household is susceptible to vulnerability due to a sudden flaw or a sudden headache, other family members will be involved in earning a living. The results of research, all households will tend to increase their labor force participation in common with these findings [17]. The care of large families and traditions helps to be a factor in reducing family vulnerability. But if the concern of the extended family and the tradition of help helps fade, the vulnerability experienced by a family with many resource constraints will increase [18].

Trends are slow changes that are generally predictable but affect the livelihood of the community if it fails to be properly anticipated by the community. It is a complex, non-independent, and accumulated change of conditions. Before feeling the impact of this vulnerability, households usually have implemented several strategies to anticipate vulnerabilities. The right strategy is to consolidate. A consolidation strategy is a strategy that prioritizes the security and stability of revenues from processing resources. This strategy contains household actions that have passed the level of security from just surviving, where they are able to meet subsistence needs[19]. This strategy is done to avoid or anticipate if the earned livelihood is not sufficient to meet the needs of subsistence or needs that are sudden.

In the event of a decrease in activities to access, process and harvest after converted land, households have difficulty obtaining food and conducting cattle/buffaloes. Households without adequate food reserves will fall into vulnerable positions. At times like this, the thing that can be done is to ask for help from the family. The resources that can be allocated by households when feeling the financial crisis crunch can be done by taking credit, taking savings, increasing work time, owing and expecting family assistance [20].

Asset sales can be used as one of the survival strategies. The sale of assets can be used as a tool for investments such as education, business capital or buying new land. In line with the results of research conducted that the assets of both houses, land, livestock have an important role in the survival of the household [20]. Assets can be used as tools to help households in crises because they can be sold, tucked away or mortgaged.

Seasonal changes are periodic and frequent changes over a period. Although it can be predicted that it will generally still have an impact on people's livelihoods, the impact is broader than the ability to anticipate the community. Similar to the vulnerability caused by the trend, seasonal vulnerability (seasonality) is addressed by households by implementing a consolidation strategy because this vulnerability is periodic and has often occurred. This is in line with the findings that when a stressor occurs due to extreme climate change, the farmer adapts well by asking for help to the family, migrating, or looking for work elsewhere [21]. Looking for side jobs, other family members participating in earning a living, and making several sales on assets is a strategic option that can be taken to get additional income. The pattern of multiple livelihoods (diversification) can be done by looking for work other than agriculture or mobilizing family labor (father, mother, or child) to work to

increase the purse of income [22]. The livelihood strategy applied by potato farmers consists of the livelihood strategies of the on-farm and non-farm sectors [23]. The strategy of diversifying the two livelihood sectors is a form of household farmers' struggle in dealing with various situations. The others research also found that gold mining in Bombana had brought people to changes in the structure of farmers' livelihoods, farmers slowly began to leave agricultural activities and turned into traditional gold miners [24]. Diversifying livelihood means not only being on the main livelihood base but also utilizing time and opportunity outside the base. Utilizing non-agricultural sectors and migrating into one of their ways to supplement income.

Similarly, migration is an effort that is done with the mobility of other areas outside their village. The research results show that farmer families in Cipeuteuy village almost 25% of their non-agricultural income is contributed to transfers of families working outside the village [22]. Migration is one-way household farmers do to support their livelihood strategies.

4. Conclusion

- The context of vulnerability facing the community is divided into three types: a). Shock with the form of vulnerability in the form of a household that has a work accident due to become a palm oil worker, b) Trend with the form of vulnerability in the form of household decreased activity to access, process and take the result of land after converted land; c) Seasonality with vulnerability form of household loss of livelihood on certain seasons.
- The farmer household livelihood strategy before conversion that has the greatest percentage is survival strategy (60%), consolidation (27%), accumulative (12%) on the agricultural basis. After land conversion, there was a decrease in the survival strategy phase (48%) as some households switched to consolidation phase (40%), and the accumulative phase remained at the percentage, with the dominant basis being agriculture and non-agriculture. Vulnerability in the form of shock, trend, and seasonality is addressed by two types of strategy, namely survival strategy and consolidation strategy by applying human capital, social capital, natural capital and finance capital.

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