The economic development of impoverished provinces in Indonesia based on Pajale commodities

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Abstract. Indonesia has several provinces that have relatively high poverty rates. Those provinces are Papua, West Papua, East Nusa Tenggara, Maluku, and Gorontalo. The government through the Ministry of Agriculture issued policy No. 14 of 2015 to accelerate food self-sufficiency. Each province has its own economics potential. So that, it's necessary to identify the potential food commodities for economic development of those provinces. This research aims (1) to identify potential Pajale commodity of each province with relatively high poverty rates, (2) to analyse specialization and localization of Pajale commodity for each province with relatively high poverty rates, and (3) to analyse the priority of Pajale commodity for economic development with relatively high poverty rates. The data used are secondary data from 2013 - 2017. The result shown that rice and soybean commodities were the basis in each province with relatively high poverty rates while maize being only a commodity base in Gorontalo and East Nusa Tenggara. Pajale commodities are not specialized and concentrated in those provinces. Only maize which become priority for economic development in Gorontalo and East Nusa Tenggara.

1. Introduction
Indonesia has a high economic growth record in decades. One of the reason is the increasing of industrialization and global economic integration [1]. However, Indonesia as an archipelago has a challenge in economic development which is to achieve equitable economic development. It needs a high cost and a lot effort from the government to achieve this goal.

The failure to achieve equitable economic development can be seen from the provinces which categorized in poor provinces. Based on the calculation of poverty conducted by BPS in 2018, the highest percentage of poor people was Papua Province with 27.74%, followed by West Papua 23.01%, East Nusa Tenggara 21.35%, Maluku 18.12%, and Gorontalo 16.81% [2].

The fact above shown that the eastern region of Indonesia has the highest poverty rates. The result of the study also shown that inequality of income and the Gini-Ratio coefficient, the provinces are determining factors of regional poverty [3].

Provinces with the highest poverty rates viewed from the economic structured are still dominated by agricultural sector. For example, contribution of the agricultural sector of Gorontalo was 37.12%, Maluku was 23.58%, and East Nusa Tenggara was 27.57% in 2017 [4]. In Pasaribu’s research in [5] states that one of the characteristic of poverty in rural society is 60% farming.
The Indonesian government has sought a lot to alleviate poverty in agricultural sector. Based on the evaluation study conducted by [6] shows that several programs such as Demapan, P4MI, and FEATI shows successfulness but synergies from various parties still need to be done for farmers independency in carry out the poverty alleviation program.

Specifically in food commodities, not only poverty problems faced but also availability and accessibility problems. The availability of food must meet the needs and easily obtained by all society. To meet the availability, the government usually imports food from abroad and implements programs to increase food production.

In Joko Widodo era, specifically in 2015, the government issued UPSUS Pajale programs that aim to achieve self-sufficiency of rice, maize, and soybean. This programs also have an impact on the economic development of the region which produces food. Indirectly, the existence and successfulness of this programs will have an impact on increasing food production in that area. Increased production will provide additional income for farmers and the region.

Before implementing the program, it’s necessary to conduct research on potential food commodities in provinces with the highest poverty rates. This should give an impact on the economic development of these provinces. So that, the implementation of the program is more specific and more targeted because each province has different regional characteristics.

2. Materials and methods

2.1. Sample
This study observes 5 provinces in Indonesia which have the highest percentage of poverty in 2018 based on data published by the Central Bureau of Statistics. They are Papua, West Papuas, East Nusa Tenggara, Maluku, and Gorontalo [2].

2.2. Data collection
The data used in this study are secondary data from 2013-2017 obtained from Central Bureau of Statistics. The data includes food commodity production, commodity prices, production values, and other data needed in this study.

2.3. Analysis tools

2.3.1. Identify potential Pajale commodities in each province with relatively high poverty rates. The analysis tool used to identify potential Pajale commodities is Location Quotient (LQ) analysis as follows:

\[ LQ = \frac{p_i/p_t}{p_i/p_t} \]

\( p_i \) is commodity production ‘i’ at the province level, \( p_t \) is total production of commodity groups at the province level, \( P_i \) is commodity production ‘i’ at the national level, \( P_t \) is total production of commodity groups at the national province.

Criteria of LQ are: (1) if \( LQ > 1 \) means the base sector, the commodity ‘i’ in a region has a comparative advantage, (2) if \( LQ = 1 \) means the non-base sector, commodity ‘i; in a region does not have a comparative advantage and the food production only enough to meet their own needs, and (3) if \( LQ < 1 \) means non-base sector, commodity in a region cannot meet its own needs so it needs external supply. The higher LQ of a sector in any region, the higher potential superiority of that sector.
2.3.2. Analyse specialization and localization of Pajale commodities in each province with relatively high poverty rates. Specialization and localization are analysed by using Specialization & Localization Quotient equation. The formula as follows:

\[ SQ = \left( \frac{w_i}{W_t} \right) - \left( \frac{W_i}{W_t} \right) \]  
\[ SQ = \sum_{p=1}^{n} SQ_{ip} \]  

\[ SQ \] is specialization quotient on commodity ‘i’, \( w_i \) is food commodity production ‘i’ at the province level, \( W_t \) is total food commodity production at the province level, \( W_i \) is food commodity production ‘i’ at the national level, and \( SQ \) is specialization quotient and \( SQ_{ip} \) is positive \( SQ_i \).

If the provincial \( SQ \) approaches one or \( SQ \geq 1 \), then there is a specialization of food commodity activities at the province level. If \( SQ \) approaches zero or \( SQ = 0 \), then there is no specialization of food commodity activities at the province level.

The equation of Localization Quotient (LcQ) is:

\[ LcQ_i = \left( \frac{w_i}{W_i} \right) - \left( \frac{W_i}{W_t} \right) \]  
\[ LcQ = \sum_{p=1}^{n} LcQ_{ip} \]  

\( LcQ_i \) is localization quotient of commodity ‘i’, \( w_i \) is food commodity production ‘i’ at the district level, \( W_t \) is total food commodity production at the district level, \( W_i \) is food commodity production ‘i’ at the province level, \( W_t \) is total food commodity production at the province level, and \( LcQ \) is localization quotient and \( LcQ_{ip} \) is positive \( LcQ_i \).

If \( LcQ \) of a district approaches one or \( LcQ \geq 1 \), at the district level there will be a concentration on food commodity activities. If \( LcQ \) approaches zero or \( LcQ = 0 \), at the district level there is no concentration on food commodity activities.

2.3.3. Analyse which Pajale commodity is a priority for economic development in each province with relatively high poverty rates. In province with relatively high poverty rates, the priority Pajale commodities are analysed by looking at the greater LQ and SQ of Pajale commodities in each province. The higher LQ of a commodity, the higher the potential superiority of the commodity. And also the higher SQ of various commodities the more they have a comparative advantage to be produce in that district. Food commodities that have the highest LQ and SQ can be prioritized for better development.

3. Results and discussion

3.1. Identifying potential Pajale commodities in each province with relatively high poverty rates

Based on the results of the LQ analysis which shows the Pajale base commodity, we found that from the 5 sample provinces, they had different Pajale base commodities. This is because each region has the different characteristics of geographical conditions, weather, climate, demand, consumption level, and others.
Table 1 shows that rice is not the basis in all sample because all LQ is less than 1. Maize are base in Papua and West Papua with LQ is 1.87 and 4.27 respectively. Soybean only base in Maluku with LQ is 2.77. The higher the LQ in a sample province shows the higher potential superiority of the commodity. It means that the export capacity of a region and the degree of self-sufficiency of commodity are also large [7].

Papua and West Papua are base of maize. In 2017, the production of maize is 10,049 tons and 1,882 tons are relatively high compared to other food commodity production in the area. Meanwhile, rice is not a base commodity in 5 sample provinces. If we accumulate the contribution of rice production, it is only 2.26% of national rice production. In the other hand, East Java contributes 16% in national rice production in the same year.

### Table 1. LQ of Pajale commodities in provinces with relatively high poverty rates

| No. | Province                | LQ | Rice | Maize | Soybean |
|-----|-------------------------|----|------|-------|---------|
| 1.  | Papua                   |    | 0.58 | **1.87** | 0.31   |
| 2.  | West Papua              |    | 0.84 | **4.27** | 0.45   |
| 3.  | East Nusa Tenggara     |    | 0.68 | 0.32  | 0.58   |
| 4.  | Maluku                  |    | 0.74 | 0.22  | **2.77** |
| 5.  | Gorontalo               |    | 0.48 | 0.07  | 0.86   |

With the relatively high production rates, it is possible for those provinces to meet the demand for commodity base in their region without importing from other regions but exporting its commodity base to region that has the demand.

3.2. Analysis of Specialization and Localization of Pajale Commodities in Each Province with Relatively High Poverty Rates

The specialization of Pajale commodities were analysed with Specialization Quotient (SQ). If SQ < 1 or approaches zero, it indicates that there has no specialization of certain Pajale commodities at the regency level. But if SQ is positive, it shows that the province has a comparative base in producing Pajale commodities.

Based on analysis, Table 2 shows that there is no sample province that has SQ > 1. This means that there is No. specialization of Pajale commodities in the province. Nevertheless, all sample provinces have a positive SQ that shown that ther have a comparative base with Pajale commodities.

### Table 2. SQ of Pajale Commodities in Provinces with Relatively High Poverty Rates

| No. | Province                | SQ | Rice | Maize | Soybean |
|-----|-------------------------|----|------|-------|---------|
| 1.  | Papua                   |    | 0.297| 0.142 | 0.001  |
| 2.  | West Papua              |    | 0.115| 0.120 | 0.022  |
| 3.  | East Nusa Tenggara     |    | 0.224| 0.128 | 0.008  |
| 4.  | Maluku                  |    | 0.181| 0.105 | 0.006  |
| 5.  | Gorontalo               |    | 0.362| 0.498 | 0.006  |
The result of LcQ analysis illustrate the level of distribution or concentration of Pajale commodities production in the province. Table 3 shows that Pajale commodities in 5 sample provinces is not centralized or Pajale production spreads in the province because LcQ approaches to zero.

Table 3. LcQ of Pajale commodities in provinces with relatively high poverty rates

| No. | Province             | Rice  | Maize | Soybean |
|-----|----------------------|-------|-------|---------|
| 1   | Papua                | -0.002| -0.004| -0.001  |
| 2   | West Papua           | 0.000 | 0.000 | 0.001   |
| 3   | East Nusa Tenggara  | -0.006| 0.015 | -0.012  |
| 4   | Maluku               | 0.000 | -0.001| -0.001  |
| 5   | Gorontalo            | -0.005| 0.030 | -0.006  |

3.3. Analysis of priority Pajale commodities for economic development in each province with relatively high poverty rates

Priority of Pajale commodities are determined based on LQ and SQ in each province. Pajale commodities are considered as priority if they have a LQ approaches one and SQ approaches one or positive. Because LQ which approaches one is a base commodity and SQ which approaches one or positive illustrates comparative base commodities that have competitiveness.

LQ and SQ in Table 4 shows that rice is not a priority in 5 sample provinces, maize can be a priority in Papua and West Papua, and soybean only can be a priority in Maluku.

In the Table found that there are provinces that have SQ approaches one but LQ less than one. So that, they cannot be used as priority commodities because they neither base nor superior commodities in the province.

Table 4. Priority of Pajale commodities

| No. | Province     | Rice (LQ) | Rice (SQ) | Maize (LQ) | Maize (SQ) | Soybean (LQ) | Soybean (SQ) |
|-----|--------------|-----------|-----------|------------|------------|--------------|--------------|
| 1   | Papua        | 0.58      | 0.297     | 1.87       | 0.142      | 0.31         | 0.001        |
| 2   | West Papua   | 0.84      | 0.115     | 4.27       | 0.120      | 0.45         | 0.022        |
| 3   | East Nusa Tenggara | 0.68      | 0.224     | 0.32       | 0.128      | 0.58         | 0.008        |
| 4   | Maluku       | 0.74      | 0.181     | 0.22       | 0.105      | 2.77         | 0.006        |
| 5   | Gorontalo    | 0.48      | 0.362     | 0.07       | 0.498      | 0.86         | 0.006        |

The priority of commodities referred to Pajale commodities that being recommended to be developed in the province. If none of the three commodities become priority, does not mean there is no food commodities that can be developed in the province. But, there may other food commodities that can be a priority or other commodities such as horticultures and plantations.

4. Conclusions

Based on the discussion, it shows that 5 sample provinces with the highest poverty rates have a different potential and regional characteristic. So that, Pajale commodities that being prioritized are also different in each province.

The results of this study are: (1) maize only being a base commodity in Papua and West Papua and
Soybean only in Maluku, (2) Pajale commodities production spread in some district or not centralized in one area, and (3) maize can be a priority commodity in Papua and Papua Barat and soybean in Maluku.

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