Analysis of potential featured agriculture commodities and processed products in Sragen Regency

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Abstract. This research aimed to identify the mapping of potential featured agricultural commodities and processed products in Sragen Regency. Data analysis used Exponential Comparative Method (ECM) and Borda Method. ECM Method showed that featured agriculture commodities at subdistrict level in Sragen Regency are Paddy, Pomelo Oranges, Corn, Banana Seedlings, Chili, Peanut, Melon, Watermelon, Sugarcane, Cassava, Arrowroot, Soybean, Fish, etc. Borda Method showed that the five featured agriculture commodities in Sragen Regency are Paddy with a value of 13,600.56; Corn 4,918.36; Sugar Cane 3,313.95; Pamelo Orange 1,466.64; and Peanut 904.64. Borda Method also showed that the featured processed products in the subdistrict level at Sragen Regency are Intip, Processed Fish, Rice, Marneng, Tempe Benguk, Ampyang, Emping Garut, Tofu, Keripik Tempe, Etawa Milk, Cornmeal, and others. Borda Method showed that the fifth rank featured processed products in Sragen Regency are Rice with the value of 7,530.2; Marneng 1,683; Emping Garut 1,241.99; Keripik Tempe 957.65; and Tempe Benguk 713.99. It means that the featured agriculture commodities in Sragen Regency feasible to economic development priority in order to support community economic welfare are Rice, Corn, Garut, Pamelo Orange, and Peanut. Meanwhile, the featured processed products in Sragen Regency feasible to develop are Rice, Marneng, Emping Garut, Keripik Tempe, and Tempe Benguk.

1. Introduction
Agricultural sector plays an important role in economy [1]. The economy is important to develop starting from regional economic development. Regional economic development is the local governments and their communities’ process of managing existing resources and establishing cooperation between local governments, private institutions, and other sectors [2]. Resource utilization and management in regions is the community’s opportunity of creating a job. This employment opportunity is related to accelerating the development of featured products in region. These featured products are expected to be market-oriented so that they can actually improve product competitiveness while providing added value to regional economic development [3]. Thus, regional economic development is expected to produce featured products that are able to compete domestically and abroad.

Agricultural sector has become an important sector in contributing to supporting national development [4], especially if the agricultural sector is supported by its processing industry.
Agroindustry is a major driver of agricultural development sector. Agroindustry can be described as industrial activities utilizing agricultural products as raw materials, designing, and providing equipment to reach the agricultural product processing industry [5]. The existence of agroindustry encourages the community to be more productive and advanced. In addition, agroindustry development can make local resources the featured product in the region [6]. Thus, the existence of local resources supported by the region’s potencies will spur productive activities aiming at increasing income, expanding employment opportunities, diversifying food and economic activities, and increasing investment in the region [7].

2. Methods

2.1. Determining Featured Commodities/Products

The selection of commodity/featured agribusiness products starts with mapping the potential featured commodities/agribusiness products at subdistrict level. The mapping is done using some criteria: number of business units/farmers cultivating, market, raw material availability, and contribution to regional economy [8].

2.2. Determining Ranked Commodities/Products using Exponential Comparative Method

The ranking of featured products displayed in the business is done using Exponential Comparative Method (ECM), a method used to determine the priority order of decision alternatives with several criteria [9].

The selection of an alternative featured commodity product business was conducted based on the idea of a resource obtained through interviewing the staffs of the Ministries of Industry and Trade, Agriculture, and Food Security, and subdistrict staffs, and PPL (Agricultural Extension Officers). The analytical formulation of the Exponential Comparative Method (MPE) is written as follows:

\[
\text{Total value (TNi)} = \sum_{j=1}^{m} (\text{RKij} \times \text{TKKj})
\]

Where:

- TNi = Total alternative values to (i)
- RKij = Relative importance degree of j-criteria for decision choice i
- Tikkij = Degree of interest to the decision criteria j, TIK > 0; round
- i = 1,2,3…n ; n= Number of decision choices
- m = Number of decision choices

2.3. Determining Featured Commodity/Product Ranking with Borda Method

Based on the identification of commodities/featured agribusiness products at subdistrict level using Exponential Comparative Method (ECM), the selection of top 10 commodities / agribusiness products featured in Sragen regency level was carried out using Borda method. Considering the result of calculations with Borda method, it can be established maximally 10 commodities/featured agribusiness products at Sragen Regency level, so it will be identified as position/potential commodity/featured agribusiness products in Sragen. The formula for calculation using Borda method is written as follows:

\[
\text{Borda X Value} = \sum (\text{ECM X} \times N)
\]

Where:

- X = Commodity/Product X
ECM $X = $ ECM Value of commodity/product

\[ N = \text{Ranking value of commodity/product } X \text{ at subdistrict level} \]

The mapping commodity/agribusiness product output is made in the form of distribution of featured commodities/ agribusiness products and commodity rank/featured agribusiness products in Sragen.

3. Results and Discussion

3.1. Mapping the Featured Agricultural Commodities

From the results of mapping using analysis of Exponential Comparison Method (MPE), it can be seen that Paddy is a featured agricultural commodity in 20 subdistricts of Sragen Regency. This is supported by the Sragen Regency’s potency to cultivate Paddy. In fact, Sragen Regency is famous for its Organic Rice Centers.

Corn becomes the leading commodity in 15 subdistricts in Sragen. This is supported by agricultural land area in the subdistrict suitable to corn farming. Sugarcane also becomes a featured agricultural commodity in 10 subdistricts in Sragen. This is due to the existence of the Mojo Sugar Factory in Sragen Regency requiring sugarcane raw materials so that many farmers plant sugarcane.

Based on an analysis using Exponential Comparative Method (ECM), it can be found that some featured agricultural commodities are produced in addition to those aforementioned: Pomelo Orange, Peanut, Melon, Watermelon, sweet potato, Garut, Soybean, Pisang Mas seeds, Chili, Fish, Crops, etc.

3.2. Determining the Potential Agricultural Commodities

Borda method aims to identify potential featured agricultural commodities at Sragen Regency level. The next step is to sort ECM value from the largest value to the lowest value. The following are the results of the determination of the potential Leading Agricultural Commodities in Sragen Regency.

| Agricultural Commodities Featured | Borda Value  | Ranking |
|----------------------------------|--------------|---------|
| Paddy                            | 13,600.56    | 1       |
| Corn                             | 4,918.36     | 2       |
| Sugarcane                        | 3,313.95     | 3       |
| Orange Pummelo                   | 1,466.64     | 4       |
| Peanut                           | 904.64       | 5       |

Considering the result of analysis using Borda method, it can be seen that the potential featured Agricultural Commodities in Sragen have five rankings. On the first rank there is Paddy with Borda value of 13,600.56. Paddy in Sragen Regency is the leading agricultural commodity in each subdistrict. Each sub-district in Sragen Regency cultivates Paddy. The highest Paddy production can be found in Sidoharjo sub-district with Paddy production of 60,140 tons in 2016.

Corn is on the second rank in Sragen. Mondokan Subdistrict has greatest potency in cultivating corn plants. This is because the corn plant itself has simple criteria for planting and does not require too much water so that many farmers plant corn in dry season.

Sugarcane is on the third rank in the potential featured Agricultural Commodities in Sragen. This is supported by the existence of the Mojo Sugar Factory in Sragen so that many farmers still work in sugarcane farming. Pomelo Orange is on the fourth rank in Featured Agricultural Commodities in Sragen with Borda value of 1,466.64. Pomelo Orange is cultivated widely in Plupuh and Gemolong subdistricts. Plupuh Subdistrict has Pomelo Orange centers located in Jembangan, Pungsari, Gedongan, and Sambirejo Villages. Meanwhile, in Gemolong Subdistrict, Pomelo Orange center is...
located in Jatibatur Village. Peanut occupies the fifth rank in the potential featured Agricultural Commodities in Sragen. Peanuts are cultivated widely in Sumberlawang, Tanon, Mondokan, Miri, and Plupuh sub-districts. This is because peanut cultivation is easier as it does not take too much water.

3.3. Mapping the Featured Processed Products Commodities
Considering the result of analysis using Exponential Comparative Method (ECM), it can be seen there are several featured processed product commodities: Intip, Mokaf, Tempe Benguk, Marneng, Cassava Chips, Soy Milk, Karak, Rice, Shredded Catfish, Banana Chips, Ampyang, Keripik Tempe, Emping Garut, Honey, Banana Sale, Peyek, Instant Jamu, and others. There is a diversity of Featured Processed Products in Sragen Regency. This is because of many processed food diversification and economic activities. Considering the results of featured agricultural commodities, it can be seen that Paddy is on the first position, so that it can also be processed into a diversity of products. Not only Paddy becomes a Featured Processed Product Commodity but there are also Intip and Karak processed from the rice. Sragen Regency becomes an Organic Rice center as well.

3.4. Determining the Potential Featured Processed Product Commodities
The next step is to sort MPE value from the largest value to the lowest one. The results of the determination of the potential featured Processed Product Commodities in Sragen Regency are presented below.

| Featured Processed Product Commodities | Borda Value | Ranking |
|---------------------------------------|-------------|---------|
| Rice                                  | 7,530.02    | 1       |
| Marneng                               | 1,683.00    | 2       |
| Emping Garut                          | 1,241.99    | 3       |
| Keripik Tempe                         | 957.65      | 4       |
| Tempe Benguk                          | 713.99      | 5       |

Rice commodity is on the first rank of potential featured Processed Product Commodities in Sragen. The need for rice in Sragen has been highly sufficed and even there is surplus productivity. This also makes Sragen Regency called the Rice Center. In addition, the marketing of Sragen rice extends outside to surrounding areas.

The second featured processed product is Marneng, with Borda value of 1,683.00. There are several Marneng processed product centers including, among others, Plupuh, Tanon, and Sukadono Subdistricts. Marneng business center in Tanon Subdistrict has the largest number of SME units processing marneng innovatively with varying tastes.

Emping Garut is the third processed product commodity in Sragen Regency. Emping Garut is made of raw materials deriving from Garut tubers in produced widely in Tangen, jenar, Miri, and Mondhokan subdistricts. The production capacity of emping Garut is 30 kg/day, but this production is still seasonal in nature because Garut tuber raw material is still difficult to get continuously.

Keripik Tempe is on the fourth rank of the featured processed products in Sragen Regency. Keripik Tempe is produced widely in Masaran and Karang Malang Subdistricts. Keripik Tempe business is driven by home industry undertaken by Women Farmer Group (WFG). The production process still uses traditional technology.

The fifth rank of featured processed products is occupied by Tempe Benguk with Borda value of 713.99. Tempe Benguk is made of raw materials deriving from Benguk Beans. Tempe Benguk is produced widely in Mondokan and Gondang Subdistricts. This Tempe Benguk has great potency but the sustainability of raw materials in Sragen Regency is not adequate for production purpose.
4. Conclusion
The Featured Agricultural Commodities feasible to be prioritized for their development in Sragen include Paddy, Corn, Sugarcane, Pomelo Orange, and Peanut. Meanwhile, the type of featured processed product commodities potential to be used as a development priority as a community economic support in Sragen regency includes, among others, Rice, Marneng, Keripik Garut, Keripik Tempe, and Tempe Benguk.

References
[1] Pantow S, Palar S, and Wauran P 2015 *J. Berkala Ilmiah Efisiensi* 15 100-12
[2] Susanto H 2014 *J. of Rural and Development* 5 63-18
[3] Yolamalinda 2014 *J. of Economic and Economic Education* 3 27-15
[4] Ayubi AA 2014 *J. Ekonomi Pembangunan* 12 1-15
[5] Udaya I G B 2011 *Singhadwala* 44 3-6
[6] Syakur U M and Hakim A 2013 *J. Ekonomi dan Perbankan Syariah* 1 49-23
[7] Prawoto N 2010 *J. Ekonomi dan Studi Pembangunan* 11 1-19
[8] Bank Indonesia 2010 *Pengembangan KPJu Unggulan UMKM Eks Karesidenan Madiun* (Kediri: Bank Indonesia)
[9] Marimin 2004 *Teknik dan Aplikasi Pengambilan keputusan Kriteria Majemuk* (Jakarta: Gramedia Widiasarana Indonesia)