

The economic feasibility of Gerga's orange (*Citrus sp.*) agribusiness as a new source of economic growth in Bengkulu, Indonesia

Andi Irawan^a, Rahmi Yuristia^b

ABSTRACT: This research gave the empirical verification that orange's agribusiness can be a source of new growth for its center production region, as in case the Gerga's orange agribusiness for Bengkulu province in Indonesia. It is verified this kind of agribusiness benefited its largest stakeholder, namely farmers, based on parameters such as B/C ratio, farmer's share, and marketing margin. From a macroeconomic perspective, Gerga's agribusiness also can solve macroeconomic problems such as poverty, unemployment, basic needs, and regional minimum wages.

La viabilidad económica del agronegocio de naranja de Gerga (*Citrus sp.*) como una nueva fuente de crecimiento económico en Bengkulu, Indonesia

RESUMEN: Esta investigación ha proporcionado la verificación empírica de que la agroindustria de la naranja puede ser una fuente de nuevo crecimiento para su región central de producción, como en el caso de la agroindustria de la naranja de Gerga, provincia Bengkulu, Indonesia. Se verifica que este tipo de agroindustria ha beneficiado a su parte más interesada, a los agricultores, en función de parámetros como el ratio B/C, la participación del agricultor y el margen de comercialización. Desde una perspectiva macroeconómica, la agroindustria de Gerga también puede resolver problemas macroeconómicos como la pobreza, el desempleo, las necesidades básicas y los salarios mínimos regionales.

KEYWORDS / PALABRAS CLAVE: B/C ratio, farmer's share, marketing margin, poverty line, regional minimum wage / Ratio B/C, participación del agricultor, margen de comercialización, línea de pobreza, salario mínimo regional.

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^a Agribusiness Dept. Faculty of agriculture, Universitas Bengkulu, Indonesia. Email: andiirawan@unib.ac.id.

^b Agribusiness Dept. Faculty of agriculture, Universitas Bengkulu, Indonesia. Email: rahmiyuristia@unib.ac.id.

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Corresponding Author: Andi Irawan.

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1. Introduction

A reliable agribusiness-based region should not think about carrying out a structural transformation of its economy by implementing the manufacturing industry. Economic structural transformation is not always synonymous with shifting the economy away from the agricultural sector to manufacturing, which is marked by the rise of factories in the region. The role of the manufacturing industry as a large absorber of labor, increasing productivity, and exports can be substituted by the agro-industry and horticultural sectors. This strategy became known as “industries without smokestacks” (industries without chimneys) (Newfarmer *et al.*, 2018) where agro-industry and horticulture are important determinants in overcoming poverty, investment, and economic growth problems (Ndhleve *et al.*, 2017; Naminse & Zhuang, 2018; Elizabeth, 2019)

Bengkulu is one of the provinces in Indonesia where the agricultural sector is an important contributor to its economic growth. The agricultural sector contributed by 29.86 percent in 2016 to 28.36 percent in 2020 of Bengkulu province’s Gross Domestic Product. The total area of agricultural land in this province is 1,724,103 hectares or 86.55 percent of the total area (1,991,933 hectares). Meanwhile, the agricultural sector is also an important source of income for the Bengkulu people, where the main source of income which is gained from the agricultural sector is 58.82 percent for poor households and 46.62 percent for non-poor households. The percentage of poor people in this province is 15.3 percent or 302,580 people from the total population (2,010.68 thousand people) in 2020 (CBS, 2021). It means the agricultural sector must be managed well by the government to reduce the poverty rate. So, the strategy of industries without chimneys should be an important consideration in the economic development of Bengkulu province.

One of the potential horticultural commodities in Bengkulu province to be developed into an industrial form without a chimney is Gerga Lebong orange (*Citrus sp.*). Jeruk Gerga is the market name applied to citrus species which is the result of a cross between sweet orange (*Citrus sinensis osbeck*) and tangerine (*Citrus reticula blanco*). This variety was first introduced to the Lebong Regency area by a local farmer named Gerga in 2009. The enthusiastic response of local farmers towards Gerga’s orange has led to Gerga agribusiness to develop in Lebong Regency where this orange was first introduced. The development of this citrus species made the Ministry of Agriculture of the Republic of Indonesia, based on Decree No. 2087 / Kpts / SA.120 / 6/2012, to categorize this citrus as a potential national citrus variety originating from Bengkulu Province, Indonesia.

Indications of the potential for Gerga orange to be developed into a source of economic growth in Bengkulu Province can be seen from the summary of information that follows; 1) Gerga’s orange are Bengkulu’s new export commodity to Kuwait and Singapore (Mardani, 2019); 2) there has been an expansion of Gerga planting by the community to other districts in Bengkulu province (Kaur Regency, Rejang Lebong, Kepahiang, Bengkulu Tengah and Bengkulu Utara) (Ismail, 2019); 3) there has been market expansion to other provinces in Indonesia (Lampung, Jakarta, South Sumatra,

Jambi and Riau) (Gesha, 2019); 4) presenting the circulation of money through local trade amounting to 94 billion rupiah (Indonesia's currency) per year (Ismail, 2019); 5) there is an obligation from the local government to plantation companies in Bengkulu province to plant 10 ha for fruit in order to suppress imports for mainstay fruit commodities according to the potential of each region including Gerga as one of the target fruit types (Firmansyah, 2015); and 6) during the Covid-19 pandemic the demand for Gerga increased as a result of its ability to become a substitute for imported oranges (Mahesa, 2020).

The research indicated that the actual land suitability in the Gerga production center area showed the potential to increase the scale of the Gerga's orange business. This can be seen from the findings Saputra *et al.* (2016) which shows the area of land suitable for Gerga development in Rimbo Pengadang Subdistrict, class S2 covering 7,236.34 hectares, S3 801.07 hectares, and N covering an area of 1,986.12 hectares. Meanwhile, in the Topos sub-district, class S2 is 5,514.83 hectares, S3 is 878.51 hectares, and N is 3,335.31 hectares.

Gerga's nutritional content is relatively better than other types of citrus. Gerga has the highest energy and protein content compared to types of grapefruit, lime, sweet, and tangerine. Likewise, the content of vitamin C and carbohydrates are two of the best compared to other oranges (Table 1). Gerga's orange bears fruit throughout the year, yellow-orange with a large fruit size of 200-350 grams, which on average is larger than other domestic oranges, and has high fruit juice content (Suwantoro in Mikasari *et al.*, 2015).

TABLE 1

Nutrient content of various types of oranges per 100 grams of orange's fruits

Types of Oranges	Energy (kcal)	Protein (gr)	Fat (gram)	Carbohydrates (gr)	Vitamin C (mg)
Lime	37	0.8	0.1	12.3	27
Sweet	45	0.9	0.2	11.2	49
Tangerines	44	0.8	0.3	10.9	31
Bali	48	0.6	0.2	12.4	43
Gerga	52	1.4	0.2	11.4	46

Source: Mikasari, 2015.

To become a new source of economic growth in Bengkulu province, it is certainly not enough to look at the potential for Gerga agribusiness only, but more than that it is necessary to examine the economic feasibility of the Gerga agribusiness development. Economic feasibility can be examined by several parameters. Firstly, the contribution of the agribusiness chain supply to the benefits of the important actors involved, namely farmers (Pashaei Kamali *et al.*, 2017). The parameters to see the economic feasibility are: 1) B/C ratio, a parameter regarding the feasibility of an economic business because it justifies whether a business profitable or not for its owner (Cita *et al.*, 2016); 2) Farmer's share, is the proportion of the amount paid by

the final consumer for the agribusiness product that the farmer receives (Busch and Spiller, 2016). Secondly, the agribusiness supply chain must contribute to reducing social problems such as poverty and unemployment (Pashaei Kamali *et al.*, 2017; Hulme and Shepherd, 2003; Hulme & Shepherd, 2003; Hulme & Shepherd, 2003; Bolwig *et al.*, 2010).

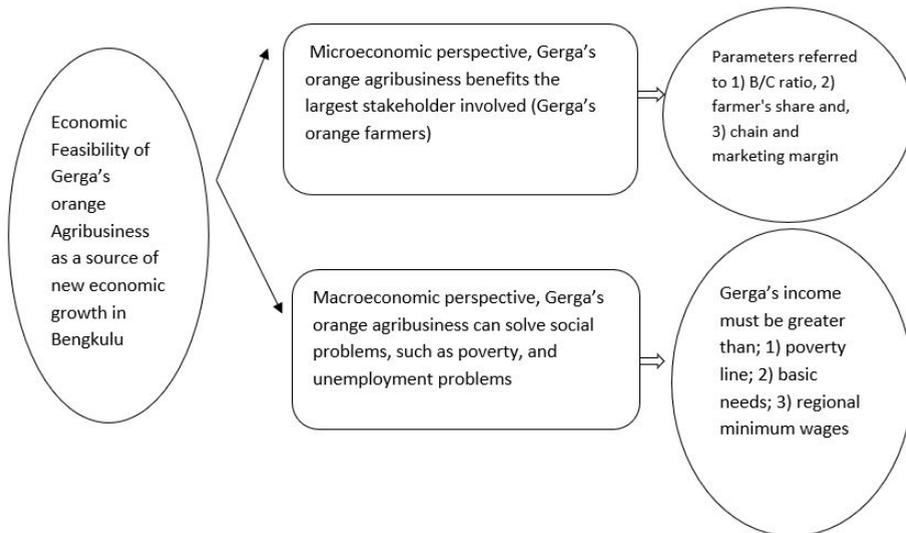
Therefore, specifically, this research aims 1) to analyze the financial feasibility of Gerga's orange agribusiness, 2) to elaborate the level of farmer's share in the Gerga's orange agribusiness, 3) to interpret whether farming income from Gerga's citrus can overcome the problem of farmer poverty, 4) to examine the level of fulfillment of the basic needs of the farmer household of Gerga's orange agribusiness in the research location, and 5) to compare the income from the Gerga's orange agribusiness with the Regional Minimum Wage.

2. Materials and methods

The framework of this research can be described as follows (Figure 1).

FIGURE 1

Research framework



Source: Own elaboration.

This research was conducted in Lebong Regency. The research location was chosen purposively with the consideration that this area is the center of Gerga's orange production in Bengkulu. Data collection was conducted during November 2016. Researchers took samples in the following way: 1) determine the location

of the sampling, namely selecting the main production center for Gerga's orange, namely the Rimbo Pengadang sub-district in Lebong Regency. The data taken at Rimbo Pengadang can represent the production behavior of all other Gerga farmers in Bengkulu Province considering that Gerga's orange cultivation in this village is a reference for Gerga's orange farmers in other areas in Bengkulu 2) Out of a total of 115 Gerga orange farmers in Rimbo Pengadang, 46 farmers who have cultivated oranges with an age of 2-3 years were randomly selected. So, the analysis of citrus farming in this study is on oranges with an age of 2-3 years. This age similarity is carried out with the consideration that the B/C ratio analysis only describes differences in the management of citrus farming, not differences in plant age.

All farmers selected as samples are farmers who own the land for Gerga's farming. Thus, based on this condition, we assume farmers are full decision-makers for their business. All the risks and benefits of their farming are entirely due to the decisions made by the farmers involved.

Primary data taken from farmers are as follows: 1) farmer profile, namely gender, education, involvement in farmer groups, family and farm size, and also their age; 2) variable cost, money for buying all production inputs such as seeds, fertilizers, pesticides, and labor; 3) fixed cost i.e. farmer expenditure on fixed inputs such as land tax and purchase of agricultural equipment in the year the data are collected; 3) the farming revenue is obtained from the price of oranges per kilogram multiplied by the amount of production in each harvest in the year in which the data was collected, then this datum is converted into monthly revenue (total revenue of Gerga's orange in 1 year divided by 12 months); 4) income is measured by the result of revenue minus total costs (fixed cost plus variable cost); 5) the supply chain of Gerga's orange from the farmer to the end consumer, and 6) expenditures of farmer households for basic needs i.e. expenditure for food, health, education, clothing, and housing in the year in which data was collected, then the data are converted into household expenditures for basic needs per month.

Then researchers used purposive sampling to choose the non-farmer-respondent who understands, knows, and has experience in the supply chain of Gerga's orange. Through this purposive sampling technique, the researchers have selected five retailers and one collector. These selected traders buy the products from all sample farmers based on information obtained from sample farmers in the field.

Secondary data collected in this study is data on the rural poverty line in Bengkulu province from Indonesia's central Bureau Statistics (BPS, 2018) and Bengkulu provincial regional minimum wage rate (BPS, 2017). Secondary data are also related to the demographic and socio-economic conditions of the research location, which were collected from the Kelurahan to the province of Bengkulu.

To measure the feasibility of Gerga's orange farming, the B/C ratio analysis was used. Mathematically, $B/C \text{ ratio} = \frac{\text{Total Benefit}}{\text{Total Cost}}$. The B/C ratio analysis is used to see the feasibility of Gerga's agribusiness. The meaning of feasibility in agribusiness, when the business is done by farmers, so the business gives the benefits from the

financial perspective. By doing this feasibility analysis could be expected the failure risks in marketing products can be avoided. Technically, the B / C ratio measures which item could be greater, the cost or the income (total revenue minus total cost) gained by farmers. The costs incurred are denoted as C (cost). The income generated is denoted as B (benefit). If the B/C ratio is equal to 0, then the revenue generated will be the same as the costs incurred. If the value of B/C ratio < 0 which means that the revenue generated is smaller than the costs incurred. This means that agribusiness is not feasible. If the B/C ratio > 0 so that the business has financial feasibility (Cita *et al.*, 2016).

This B/C ratio analysis has also been carried out to assess the feasibility of citrus farming in several other research sites such as Mandarin orange in Gulmi, Nepal (Gautam *et al.*, 2020), *Kepron SoE* citrus farming in Timor Tengah Selatan, Indonesia (Namah & Sinlae, 2012), orange farming in Magetan regency, Indonesia (Retnoningsih, 2017), *Siamese* orange (*Citrus Nobilis Lour Var. Microcarpa Hassk*) farming in Karo district, North Sumatra Province, Indonesia (Prandoa *et al.*, 2015).

The measurement of B/C ratio in this study is measured in one year, that is, the year when this data was collected. So, we need to inform explicitly this limitation of this study, because of analysis B/C ratio is not based on multi-year data. So it is possible the change the conclusions of the research by using multi-year data. There were time and budget constraints that did not allow us to collect multi-year data for B/C ratio analysis.

Farmer's share is the ratio between the price at the producer and consumer level in a percentage value. Busch & Spiller (2016); Putri *et al.* (2014) formulated the farmer's share as follows:

$$F_s = \frac{pf}{pr} \times 100\% \quad [1]$$

Where F_s : The share of the price received by farmers; pf : Price at farm level (IDR (Indonesia currency)/ kg); pr : The final consumer-level price (IDR / kg). There are no previous studies that reveal how much is the farmer's share for Gerga's orange farmers. This parameter needs to be verified to see the share of Gerga orange farmers gained from the price paid by the end consumer.

In terms of feasibility from a macroeconomic perspective, Gerga agribusiness can become a source of new economic growth if it can overcome poverty problems of the biggest stakeholders involved in this business i.e. farmers (Pashaei Kamali *et al.*, 2017; Hulme & Shepherd 2003; Bolwig *et al.*, 2010) . For this reason, the income of farmers from Gerga's orange farming must be greater than the poverty line of Lebong Regency, the area where this agribusiness is located. This condition is formulated as follow:

$$PCIG - PL > 0 \quad [2]$$

Where PCIG: income per capita per month from Gerga's orange farming, PL: Per capita poverty line of rural areas in Bengkulu province (BPS, 2018).

Household income from Gerga's agribusiness can be a measure of welfare if the income received from the agribusiness per month can meet the basic needs of a farmer's household per month (clothing, food, housing, education, and health) (Minkin & Reyes-García, 2017). This situation is formulated mathematically as follows:

$$IG - EON > 0 \tag{3}$$

Where IG: income from Gerga's orange farming per month, EON: Expenditure on necessities (clothing, food, shelter, health, education, housing) per month.

The income of farmers from Gerga's orange farming can prevent urbanization in the surrounding cities, especially in the city of Bengkulu. For this reason, the income from Gerga's orange farming must be greater than the Regional Minimum Wage (RMW) for the city of Bengkulu. This condition is formulated as follows:

$$PCIG - RMW > 0 \tag{4}$$

Where PCIG: Per capita income of Gerga's orange farming per month, RMW: Bengkulu City Regional Minimum Wage.

3. Results and discussion

3.1. B/C ratio analysis

The B/C ratio value of all farm sizes is more than 1 (Table 2), even for small-scale farms (< 0.5 hectares) whose B/C ratio ranging from 1.19 to 2.16. This B/C ratio value means that every IDR 1 that farmers spend as costs will generate income of IDR 1.19 to 2.16 for farm size with land less than 0.5 hectares. 302,917 smallholder farmers in Bengkulu have land less than 0.5 hectares (CBS, 2018), and Gerga's orange is a suitable business for them.

TABLE 2

The value of B/C ratio for different Gerga's orange farm size

Farm size (hectare)	Number of farming	B/C ratio value
≤ 0.5	9	1.19 to 2.16
1	24	1.11 to 2.27
1.5 - 3	9	1.67 to 2.51
Total	42	

Source: Own elaboration.

The results of this study are in line with the B/C ratio analysis of citrus agribusiness in many other production center locations in Indonesia where the B/C ratio is greater than 0 (East Nusa Tenggara tangerine with a value of 1.44) (Namah & Sinlae, 2012); Siam orange in Bangli Regency with a value of 4.89 (Cita *et al.*, 2016), Tangerines in Bantaeng Regency with a value of 2.06 (Sudirman and Basri, 2013); and Garut oranges in the Garut district with a value of 2.16 (Susilowati *et al.*, 2006).

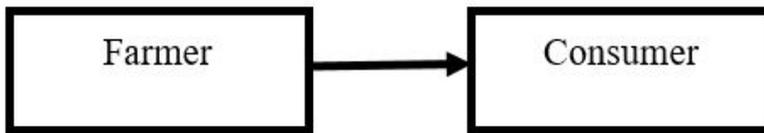
The B/C ratio of all sample farmers that is greater than 0 indicates that this Gerga's orange farming has financial feasibility to continue to be developed because all Gerga's orange farmers get a bigger income than the costs they spend on this Gerga's orange agribusiness.

3.2. Farmer's share

Before showing the size of the farmer's share, it is necessary to show the marketing channels of Gerga's orange. There are four marketing channels for Gerga's orange. First, marketing channel I as illustrated in Figure 2.

FIGURE 2

Marketing chain I, connect farmers directly to consumers



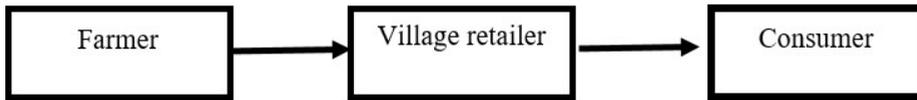
Source: Own elaboration.

The first marketing channel is the shortest, consisting of farmers and consumers of Gerga's orange. Farmers have marketing channel I because their house is on the side of the road, so they can immediately open a stall to sell oranges on the side of the highway. Another form of this first channel is that farmers provide direct access to their gardens by taking advantage of consumers' desire to enjoy the sensation of picking their Gerga's orange. Usually, this is done by city dwellers who come to the location not only to buy oranges but also for tourism and vacation. The selling price in the first marketing channel depends on Gerga's orange grading. Local farmers grade their production in three-class namely the *super*, *coral*, and *unyil*. *Super* is a class in which each kilogram only consists of 3 to 4 pieces with a selling price of IDR 25,000 per kilogram. Meanwhile, the *coral* is class which in one kilogram of Gerga's orange consist 6 to 8 pieces with a selling price of IDR 20,000 per kilogram and the smallest class i.e. *unyil* which one kilogram consists of 8 to 10 pieces with a selling price of IDR 15,000 per kilogram.

Second, marketing channel II is a marketing channel consisting of farmers, village-level retailers, and consumers. In general, the way farmers sell to retailers is

to use *the trabas* system (wholesale) by equalizing the selling price of IDR 12,000 to IDR 15,000 per kilogram regardless of the class of citrus. However, some farmers sell by classifying them, namely *the unyil* class valued at IDR 12,000, the *coral* class IDR 13,500, and the *super* class IDR 15,000 per kilogram. In this marketing chain, the transportation costs for the movement of Gerga's orange from farmers to retailers and from retailers to consumers are borne by the retailers.

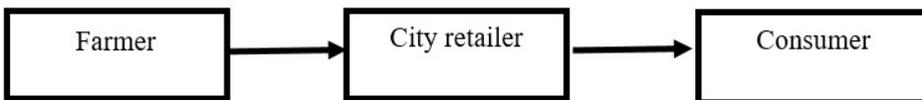
FIGURE 3
Marketing chain II



Source: Own elaboration.

Third, marketing channel III (Figure 4) where farmers sell Gerga's orange directly to retailers in the city of Bengkulu. Usually, retailers place an order by telephone and then the farmer will send the order via travel. Payments are usually transferred via a bank. The cost of shipping Gerga's orange from the farmer to the retailer will be paid by the retailer to the transportation service provider after the goods arrived. Transportation costs are IDR 35,000 for each 40 kg (depending on a load of Gerga's oranges). The sales system used by farmers to retailers is to use *the trabas system* (wholesale) by equalizing the selling price of IDR 12,000 to IDR 15,000 per kilogram regardless of the size class of Gerga's orange. The price of Gerga's orange at the consumer level for each kilogram is IDR 28,000 for the *unyil*, IDR 30,000 for *coral*, and IDR 32,000 for *super* respectively.

FIGURE 4
Marketing chain III

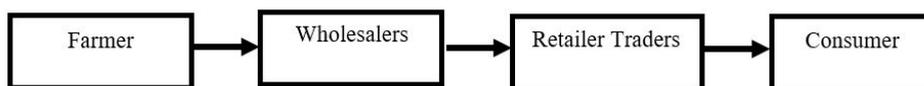


Source: Own elaboration.

The fourth marketing channel (Figure 5) involves four marketing agencies consisting of farmers, wholesalers, and retailers at the city level and then consumers. Farmers usually negotiate in advance with wholesalers regarding the purchasing system for Gerga's orange. Some use the *trabas* purchasing system (determining the selling price of oranges without considering the size of the oranges). Usually, the selling price is IDR 12,000 to IDR 15,000 per kilogram. Purchasing of oranges can also be based on the size of Gerga's orange, namely *unyil*, *coral*, and *super*. The

unyl class is priced at IDR 12,000, the *coral* class IDR 13,500, and the *super* class IDR 15,000 per kilogram. Wholesalers resell Gerga's orange to retailers in varying volumes to each retailer in the city. The price offered to consumers varies for each kilogram namely IDR. 28,000, - for the *unyl*, IDR. 30,000 for the *coral*, and IDR. 32,000 for the *super* respectively. In marketing chain IV, shipping costs from farmers to wholesalers and from wholesalers to retailers are borne by wholesalers.

FIGURE 5

Marketing chain IV

Source: Own elaboration.

The average farmer's share shows that the highest farmer's share rate is in both the first and the second marketing chain i.e. 58.0 percent. This value indicates that farmers as producers receive a price of 58 percent of the price paid by consumers. Meanwhile, the third and fourth marketing chain give farmer's share as much as 45.3 percent respectively.

From this farmer's share parameter, it can be seen that farmers as important actors of Gerga agribusiness get a proportion of the final selling price of Gerga of 45 to 58 percent (Table 3). Farmer's share of citrus agribusiness in other areas shows the same phenomenon as the farmer's share of this study, which is above 40 percent as shown by Siamese oranges in Kampar. (Hasudungan *et al.*, 2018), Siamese orange of Limapuluh Koto (Young & Deng, 1998) and Palemo Magetan oranges (Isaskar *et al.*, 2011).

TABLE 3

The average value of farmer's share for each marketing chain

Marketing chain	Price at farmer level (IDR / Kg) ¹⁾	Price at the consumer level (IDR / Kg) ¹⁾	Farmer's share (percentage)
I	14,523	25,000	58.0
II	14,523	25,000	58.0
III	14,523	32,000	45.3
IV	14,523	32,000	45.3

Note:¹⁾ Average price at each marketing chain.

Source: Own elaboration.

3.3. Comparison of Gerga's orange income with poverty line

The results of this study indicate Gerga agribusiness has the potential to release farmers from poverty because the income per capita per month of Gerga farmer

households (80.96 percent of the total sample) is greater than the poverty line in rural areas of Bengkulu province i.e IDR 427,315 per capita per month. The remaining 8 households or 19.04 percent are still categorized as poor because Gerga's per capita income ranges from IDR 170,097 to 415,219 per month per capita (Table 4), which is still lower than the poverty line i.e. IDR 427,315 per capita per month. This phenomenon shows that Gerga agribusiness has the potential to release farmers from poverty because the per capita income per month they get from Gerga agribusiness is higher than the rural poverty line in Bengkulu province.

The number of farmer households whose income is above the poverty line in this study (80.96 percent) is greater than the citrus farmer households in Barito Kuala (62.86 percent of citrus farmer households whose income from citrus farming above the poverty line) (Rahmadi *et al.*, 2019). This research finding is also in line with the study of Imai *et al.* (2015) which shows that the growth of the agricultural sector plays an important role in reducing inequality and poverty.

TABLE 4.

Comparison of per capita income per month of Gerga's farming and a poverty line

Item	Farm size (Ha)	Member of the household (person)	Per capita income from Gerga (Gerga's profit per month in IDR)	Number of households (percentage)
Households whose income is below the poverty line	0.25 to 0.5	2 to 6	170,097 to 415,219	8 (19.04)
Households whose income is above the poverty line	0.5 to 3	2 to 7	434,333 to 2,093,813	34 (80.96)

Source: Own elaboration.

3.4. The income capability of Gerga's orange fulfills the basic needs of the household farmer

Agribusiness will be sustainably managed by farmers when the income received from the agribusiness can meet the basic needs of their household. The basic needs referred to the needs for health, education, food, clothing, and housing. The results showed that there were 33.33 percent of Gerga's orange farmer households whose total household income was not able to meet the monthly household basic needs. This means that most of the Gerga's farmer households (66.67 percent) are categorized as households whose income has been able to meet their basic needs. The results of this study further strengthen empirical evidence that agribusiness can improve farmers' welfare. Previous researches that show similar results with this study are Mulyadi (2017); Simon Matakena (2017).

The results also show that the household income of Gerga with a business scale of 2 hectares and above can meet all the basic needs of the household. As for farmers with an area of fewer than 2 hectares, they must be supported with additional income from other sources (from other farming and non-farming). This shows that farmers with small land (less than 2 Ha) have difficulties to fulfill their basic needs if they do not diversify their sources of income.

3.5. Comparison of Gerga's income and regional minimum wages

Another economic feasibility is when the income from agribusiness can prevent farmers from urbanizing. Farmers will seek additional income by looking for work in the city if farming cannot meet the economic needs of their household. The results of this study indicate that Gerga agribusiness has the potential to prevent urbanization and change the profession of farmers to the informal sector or industrial labor because the monthly income received from Gerga's orange is greater than the Regional Minimum Wage in Bengkulu City IDR 1,605,000 per month. (BPS, 2017) . As many as 83.33 percent of farmer households have an income per month that is higher than the Regional Minimum Wage in Bengkulu City. The remaining 16.67 percent (7 households) are still classified as having less than the Regional Minimum Wage. This happens because their farming size is very small, namely 0.25 to 0.5 Ha (Table 5).

The research finding shows that the monthly income received from Gerga's orange is greater than the Regional Minimum Wage for the city of Bengkulu, indicating that Gerga agribusiness has the potential to prevent urbanization. The income received every month from Gerga's farming is higher than the Regional Minimum Wage so that Gerga's orange agribusiness provides a better income opportunity than working in the city. As stated by Williamson in Young & Deng (1998), poor agricultural conditions in rural areas and opportunities for greater income in cities are the strong motivations of urbanization.

TABLE 5

Comparison of income per month from Gerga's farming and regional minimum wage

Item	Farm size (Ha)	Gerga's profit per month (IDR)	Regional minimum wage of Bengkulu (IDR)	Number of households (percentage)
Farmer household with an income higher than the Regional Minimum Wage.	0.5 to 3	1,660,875 to 8,375,250	1,605,000	35 (83.33)
Farmer household whose income is lower than the Regional Minimum Wage.	0.25 to 0.5	680,388 to 1,266,375	1,605,000	7 (16.67)

Source: Own elaboration.

4. Conclusions

The research conclusions are as follows: 1) All Gerga farmers' agribusinesses have a B/C ratio coefficient value ranging from 1.1 to 2.45 which indicates that Gerga agribusiness has economic feasibility to be developed; 2) The farmer's share values show that farmers as important actors of Gerga agribusiness get 45 to 58 percent of the price paid by consumers; 3) Gerga's orange agribusiness has the potential to release farmers from poverty because 80.96 percent of farmers have a monthly income per capita that is higher than the poverty line for rural areas of Bengkulu province; 4) The scale of the Gerga's orange business which can meet the basic needs of the farmers is 2 Ha and above. As for farmers with an area of less than 2 hectares, they must be supported with additional income from other sources (farming and non-farming) to be able to meet the basic needs of their household; 5) Gerga's orange agribusiness has the potential to prevent urbanization and change the profession of farmers to the informal sector or industrial workers because the monthly income received from Gerga's orange is greater than the Regional Minimum Wage in Bengkulu. As many as 83.33 percent of farmers have an income per month that is higher than the Regional Minimum Wage. Thus the results of this study can be one of the important considerations for the government to make Gerga's orange agribusiness a source of new regional economic growth.

To improve the performance of this agribusiness, the local government should implement some improvement action as follows: 1) rehabilitate the damaged village roads to facilitate the movement of oranges from production areas; 2) agricultural extension is aimed at providing certified-seed breeding skills by farmer groups because farmers in the research location still rely on certified-seed sources from Java which require more than 24 hours travel for seed delivery from seed source areas; 3) field observations show that all farmers rely on their capital or other non-bank sources to run their business. Thus, one of the important farmer extension programs is to provide farmers with the skills to access banking funds; 4) important production inputs i.e. fertilizers are often scarce when needed so that the price becomes expensive, local governments should also include these Gerga's orange smallholder farmers as targeting farmers to get fertilizer subsidies from the central government.

Further research that needs to be done is to analyze comprehensively if there are changes in important variables such as input prices, output prices, and labor wages not only on the performance of the Gerga's farming such as production and income but also on the ability of farmer's household to meet their basic needs in one agricultural household economic model. Thus, it can be known what variables mostly determine the performance of the Gerga's farming and the welfare of its farmer's household. It would be convenient also for future research to introduce some environmental variables or indicators to evaluate sustainability in the environmental aspects.

Conflict of interest

The authors declare that they have no conflict of interest.

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