Income and welfare level of cassava farmers during covid-19 pandemic era in Lampung Province

W A Zakaria¹, L S M Indah¹*, T Endaryanto¹, and D Hermawan²

¹ Department of Agribusiness, Faculty of Agriculture, University of Lampung, Bandar Lampung.
² Public Administration Departement, University of Lampung, Bandar Lampung.

* Corresponding Author: lidya_masindah@yahoo.com

Abstract. Indonesia is currently experiencing the Covid-19 pandemic which first started in March 2020. This outbreak continuously spreads throughout the regions including Lampung Province and has adversely affected economic activity of the society which included household income and welfare of cassava farmers. This study aims at analyzing the level of household income and welfare of cassava farmers during Covid-19 Pandemic Era in Lampung Province. This study applied survey method and conducted in the Regency of Central Lampung and East Lampung as cassava production center area in Lampung Province. A total of 120 people consisted of 60 people from each regency were selected through the method of simple random sampling. Data collection was conducted in July 2020. Data analysis was done using quantitative descriptive method. The level of household welfare of cassava farmers was analyzed according to the indicator of BPS, and Sajogyo. Result of the study showed that farmers experienced problems in accessing capital, production facility, and market of product during the Covid-19 era. Income gained from cassava farming dominated household income. However, there were only 31.67 percent of cassava farmers in Central Lampung and 5 percent in East Lampung who were classified as non-poor, while the rest were found to be near-poor and suffered from poverty. Food expenditure still dominated the total household expenditure and expenditure for personal hygiene was non-food expenditure that was considered quite high.

1. Introduction

Food security is one of the main priorities in national development. The subsector of food crops plays essential role to achieve national food security by supplying both raw materials for industry and food needs for the society. Moreover, employment absorption in this subsector is quite high. The program of National Food Security as one solution to overcome food insecurity in Indonesia. In fact, reduction of food insecurity will only occur if food security is achieved at household level [1]. One of important commodities in food crop subsector is cassava. Moreover, cassava farming that is optimally performed might become one of production increase sources to fulfil food needs of the society besides creating income source for farmers [2].

Lampung Province is the largest cassava production area in Indonesia. At the level of province, Central Lampung Regency is the main cassava production area in Lampung Province. In 2016, total
cassava harvested area in Central Lampung Regency reached 68.720 ha with cassava production of 1.730.156 ton, placing Central Lampung Regency not only as regency with the largest cassava production in Lampung, but also in Indonesia. In 2018, actual average cassava production ranged of 23.5 ton per ha which was still considered low if compared with the potential production of 30-35 ton per ha [3]. Low productivity was caused by the use of less superior variety, delayed fertilizer application, inappropriate dose, and limited irrigation facility [4].

The characteristics of cassava farmers in farming business reflect moral economy which is characterized by kinship, group, or the tradition of mutual assistance-based existence without maximum use of modern technology due to limited capital [5]. The value of RC on total cost obtained by cassava farmers in Lampung Province was 2.02, indicating that cassava farming was feasible [3]. However, the value could not yet interpret the welfare level of cassava farmer in Lampung Province. Factors that affected cassava farmer welfare included education, total household income, land ownership, years of farming experience, and production cost [6].

Non-technical problems faced by farmers in performing farming business will inhibit farmers from effectively and efficiently conducting farming, thus affecting their level of welfare. Cassava farming in Lampung Province is considered technically efficient, yet improvement is still necessary [7]. Problems faced by farmers included the limited use of production technology due to lack of knowledge, limited farm capital, farm management inefficiency, the absence of market assurance which resulted in low price received by farmers due to low bargaining power of farmers to processing factory, declining of soil fertility, thus lowering cassava productivity, and increase in input requirement and cost spent on cassava farming [3]. Based on the description, analysis of cassava farmer welfare in Lampung Province is necessarily done.

2. Research Methods
This study was conducted in Lampung Province. Research location was purposively determined by consideration that Lampung Province is the largest cassava production area in Indonesia. Research was carried out from April-September 2020. This study applied survey method in the location of cassava production center in Lampung Province. A total of 120 cassava farmers were selected as research sample through simple random sampling. Data analysis was done using the method of quantitative descriptive, namely by performing analysis of welfare level according to the indicator of BPS and Sajogyo.

Analysis tools applied to measure the level of cassava farmer welfare included five indicators introduced by Badan Pusat Statistik (Statistics Indonesia) 2015 which consisted of indicators of population, health and nutrient, education, housing and environment, and other social aspects. There are two classifications of welfare used in this study, namely non-poor household and poor household. Variables of observation along with classification and score which represented the weight of indicator classification were also presented.

Level of household welfare according to Sajogyo is seen from the annual household expenditure per capita, that is total expenditure of farmers, both food and non-food expenditure, divided by the number of dependents. Total household expenditure was further converted to unit equaled to rice per kilogram on the basis of applicable price in research location to determine welfare level of farm household [8].

3. Results and discussion
3.1 The role of household economy of cassava farmers
Household economic resilience of cassava farmers is an important factor which ensures the sustainability of farmer welfare. Poor socio-economic condition has insisted farmers to rationally make decision to increase their income by working in non-cassava farming sector. This way, their needs are expected to be met. Fluctuated cassava price along with uncertainty of production input availability and limited capital have made farmers to make such effort to increase their welfare. Welfare of farmer highly affected the source of household income. Contribution of household income of cassava farmer is listed in Table 1.
### Table 1. Contribution of household income of cassava farmers in Lampung Province.

| Source of Household Income                                      | Central Lampung |          | East Lampung |          |
|----------------------------------------------------------------|----------------|----------|--------------|----------|
|                                                                | Income         | Percentage | Income       | Percentage |
| Income from cassava farming (on-farm)                          | 21,318.907     | 46,43    | 21,355.564   | 51,51    |
| Income from non-cassava farming (on-farm)                      | 12,112.609     | 26,38    | 884.333      | 2,13     |
| Farm income from outside of farming activity (off farm)        | 6,043.091      | 13,16    | 8,578.400    | 20,69    |
| Income from non-farming business (non Farm)                    | 6,438.667      | 14,02    | 10,637.333   | 25,66    |
| Total                                                          | 45,913.274     | 100      | 41,455.630   | 100      |

Source: Primary Data, processed (2020)

Based on Table 1, income gained from cassava farming was still found to be dominant, both by cassava farmers in Central Lampung (46.43 %) and East Lampung (51.51%). This finding was in line with study that report the highest income contribution of farm household was from cassava farming [3]. Similarly, farmer income in East Lampung was earned from cassava farming. It shows that agriculture still plays important role in the economy of farm household [9]. Conversely, income from outside of farming activity is an important factor which influences the welfare of farmers [10]. This type of income is obtained from labor, poultry, sheep, and cattle farmers, drivers, traders, and other business. Result of study showed that income from outside of cassava farming only had a small contribution to the economy of farm household. For cassava farmers in Central Lampung, income from off-farm activity contributed the lowest, while the lowest income contribution in cassava farmers in East Lampung was earned from non-cassava farming of 2.13 %. This result was due to covid-19 pandemic which has been going for more than 6 months, causing farmers unwillingly leave their house besides the PSBB (social distancing) regulation.

This pandemic situation will affect welfare level of cassava farmers. Furthermore, the regulation of PSBB or social distancing has created several impacts, such as hindering the distribution of production facility and transportation, also causing limited availability of production facility, thus lowering cassava production and resulting in low welfare of farmer. For the last 20 years, or since 2018, there was declining welfare level of farm household in Lampung Province [11]. Analysis tools used to measure welfare level of cassava farmers in Lampung Province was in accordance with the five indicators of Badan Pusat Statistik (2014) which included population, health and nutrient, education, housing and environment, and other social aspects. Several welfare indicators of cassava are listed as follows:

### Table 2. Achievement of BPS indicators 2015.

| Indicator             | Central Lampung |          | East Lampung |          |
|-----------------------|----------------|----------|--------------|----------|
|                       | Class          |          | Class        |          |
|                       | B  | C | K | B  | C | K |
| Population            | ✓  | ✓ | ✓ | ✓  | ✓ |   |
| Health and nutrient   | ✓  |   | ✓ | ✓  |   |   |
| Education             | ✓  | ✓ |   | ✓  | ✓ |   |
| Housing and environment| ✓ |   | ✓ | ✓  |   |   |
| Other social concerns | ✓  | ✓ |   | ✓  | ✓ |   |

Source: Primary data, processed (2020)

Remarks:
B: Good
C: Moderate
K: Poor

---

This pandemic situation will affect welfare level of cassava farmers. Furthermore, the regulation of PSBB or social distancing has created several impacts, such as hindering the distribution of production facility and transportation, also causing limited availability of production facility, thus lowering cassava production and resulting in low welfare of farmer. For the last 20 years, or since 2018, there was declining welfare level of farm household in Lampung Province [11]. Analysis tools used to measure welfare level of cassava farmers in Lampung Province was in accordance with the five indicators of Badan Pusat Statistik (2014) which included population, health and nutrient, education, housing and environment, and other social aspects. Several welfare indicators of cassava are listed as follows:

### Table 2. Achievement of BPS indicators 2015.

| Indicator             | Central Lampung |          | East Lampung |          |
|-----------------------|----------------|----------|--------------|----------|
|                       | Class          |          | Class        |          |
|                       | B  | C | K | B  | C | K |
| Population            | ✓  | ✓ | ✓ | ✓  |   |   |
| Health and nutrient   | ✓  |   | ✓ | ✓  |   |   |
| Education             | ✓  | ✓ |   | ✓  | ✓ |   |
| Housing and environment| ✓ |   | ✓ | ✓  |   |   |
| Other social concerns | ✓  | ✓ |   | ✓  | ✓ |   |

Source: Primary data, processed (2020)

Remarks:
B: Good
C: Moderate
K: Poor

---

This pandemic situation will affect welfare level of cassava farmers. Furthermore, the regulation of PSBB or social distancing has created several impacts, such as hindering the distribution of production facility and transportation, also causing limited availability of production facility, thus lowering cassava production and resulting in low welfare of farmer. For the last 20 years, or since 2018, there was declining welfare level of farm household in Lampung Province [11]. Analysis tools used to measure welfare level of cassava farmers in Lampung Province was in accordance with the five indicators of Badan Pusat Statistik (2014) which included population, health and nutrient, education, housing and environment, and other social aspects. Several welfare indicators of cassava are listed as follows:

### Table 2. Achievement of BPS indicators 2015.

| Indicator             | Central Lampung |          | East Lampung |          |
|-----------------------|----------------|----------|--------------|----------|
|                       | Class          |          | Class        |          |
|                       | B  | C | K | B  | C | K |
| Population            | ✓  | ✓ | ✓ | ✓  |   |   |
| Health and nutrient   | ✓  |   | ✓ | ✓  |   |   |
| Education             | ✓  | ✓ |   | ✓  | ✓ |   |
| Housing and environment| ✓ |   | ✓ | ✓  |   |   |
| Other social concerns | ✓  | ✓ |   | ✓  | ✓ |   |

Source: Primary data, processed (2020)

Remarks:
B: Good
C: Moderate
K: Poor
Based on Table 2, it is known that the value of indicator of population and education both in Central Lampung and East Lampung was classified as good. However, this result was not in line with the study who reported that education level of farmer was still low, yet this study obtained high value for the indicator of education [11]. Furthermore, cassava farmers both in Central Lampung and East Lampung obtained a moderate score in term of health and nutrient, housing and environment, and other social aspects. Therefore, welfare level of cassava farmers in both regions were considered similar.

The indicator of health of farm household also belonged to moderate category since most farm households both in Central Lampung and East Lampung still found difficulties to access health facility along with high cost of health service, thus sick members of farm household were not immediately taken to the public health center (puskesmas) or hospital. Knowledge and skill of farmers to meet nutrient requirement for family was still low as similarly found by study who report that the majority of cassava farm household was in the condition of food insecurity [12].

3.2 Analysis of household welfare according to the Theory of Sajogyo

The level of household level according to Sajogyo is seen from the amount of household expenditure per capita per year [8]. The annual household expenditure per capita is total expenditure of farmers, both food and non-food expenditure, divided by the number of dependents. In line with the study who report that measurement of welfare level is possibly done based on household expenditure and income of farm household [13] [14] [15]. Total household expenditure was further converted to unit equaled to rice per kilogram on the basis of applicable price in research location of Rp9,450,00 to determine welfare level of farm household. Welfare distribution of cassava farm household in Lampung Province is showed below.

| Group       | Interval of score (equal to rice/year) | Percentage (%) | Central Lampung | East Lampung |
|-------------|----------------------------------------|----------------|-----------------|--------------|
| Poorest     | <180 kg                                | 0.00           |                 |              |
| Very poor   | 181-240 kg                             | 0.00           | 13.33           |              |
| Poor        | 241-320 kg                             | 3.33           | 15.00           |              |
| Near-poor   | 321-480 kg                             | 11.67          | 30.00           |              |
| Adequate    | 481-960 kg                             | 53.33          | 30.00           |              |
| Non-poor    | >960 kg                                | 31.67          | 5.00            |              |
| Total       |                                       | 100            | 100             |              |

Source: Primary data, processed (2020)

Based on Table 3, most (53.33%) cassava farmers in Central Lampung belonged to the adequate category. Moreover, cassava farmers in East Lampung were dominated by those included in near-poor (30%) and adequate (30%) category. This is because the household income of cassava farmers in Central Lampung is higher than in East Lampung. In addition, Central Lampung is the parent district with a much more complete and better regional infrastructure than East Lampung Regency, which is an expansion area of Central Lampung. Group distribution of welfare level of respondent farmers is presented in Table 4.
Table 4. Group distribution of welfare level of farm household.

| Category of Welfare | Central Lampung | East Lampung |
|---------------------|----------------|-------------|
|                     | Total (household) | % | Total (household) | % |
| Non-poor            | 49 | 81.67 | 57 | 95.00 |
| Poor                | 11 | 18.33 | 3 | 5.00 |
| Total               | 60 | 100 | 60 | 100 |

Source: Primary data, processed (2020)

Based on Table 4, cassava farmers were mostly not poor, both those in Central Lampung and East Lampung. Percentage of cassava farmers included in non-poor category in East Lampung were greater than those in Central Lampung. The reason is that 95 percent of cassava farmers in East Lampung belonged to non-poor category, while in Central Lampung, it was only 81.67 percent.

More cassava farmers in East Lampung were found to have better life than those in Central Lampung by reason of higher household expenditure of cassava farmers in Central Lampung that reached Rp14,542,884.81 for food expenditure and Rp11,647,070.00 for non-food expenditure. This result of study was in line with a research which showed that most cassava farmers in Sukadana Subdistrict of East Lampung Regency were included in non-poor category [9]. This situation was due to the fact that 100 percent of cassava farmers in East Lampung already used the Thailand variety, while 50% of cassava farmers in Central Lampung still used the Cassesart variety. Adoption of technology by applying superior variety will increase farmer welfare.

Table 5. Household expenditure of cassava farmers in Lampung Province in 2020.

| Type of Expenditure  | Central Lampung Value (Rp) | East Lampung Value (Rp) |
|----------------------|---------------------------|----------------------|
| Food Expenditure     | 14,542,884.81             | 14,208,647.92         |
| Non-food expenditure | 11,647,070.00             | 14,212,766.67         |
| Total Expenditure    | 26,189,954.81             | 28,421,414.58         |

Source: Primary data, processed (2020)

Based on Table 5, household expenditure of cassava farmers in East Lampung was higher than those in Central Lampung, respectively of Rp28,421,414.58 and Rp26,189,954.81. Moreover, food household expenditure of cassava farmer in Central Lampung was found to be higher than that of cassava farmers in East Lampung, namely Rp14,542,884.81. However, non-food expenditure of cassava farmers in East Lampung was Rp14,212,766.67. The highest non-food expenditure was spent by farm households both in Central Lampung and East Lampung on fuels and goods and services [16].

4. Conclusion

Based on the result of study, it is concluded that income from cassava farming still played important role in the household economy of cassava farmers. During the Covid-19 era, farmers experienced difficulties to access capital, production facility, and market of product. Income gained from cassava farming was found to dominate household income. However, there were only 31.67 percent of cassava farmers in Central Lampung and 5 percent in East Lampung who were classified as non-poor, while the rest were near-poor and lived in poverty. Food expenditure was still dominant and expenditure for personal hygiene was non-food expenditure that was considered quite high. The level of welfare of cassava farmers in Lampung Province according to the measurement of BPS and Sajogyo, and subjective well-being indicators was included in non-poor category.
References

[1] A. Azwardi, H. F. Widyasthika, R. C. Saleh, and N. Adnan 2019 Household Food Security: Evidence From South Sumatera JEJAK 12 2 doi: 10.15294/jejak.v12i2.20264.

[2] L. Geo 2020 ANALYSIS OF PRODUCTION AND INCOME OF CASSAVA FARMING Int. J. Res. -GRANTHAALAYAH 8 4 doi: 10.29121/granthaalayah.v8.i4.2020.21.

[3] W. A. Zakaria, T. Endaryanto, L. S. Mas Indah, I. R. Meliya Sari, and A. Mutolib 2020 PENDAPATAN DAN KESEJAHTERAAN RUMAH TANGGA PETANI UBIKAYU DI PROVINSI LAMPUNG J. Agribisnis Indoones 8 1 doi: 10.29244/jai.2020.8.1.83-93.

[4] G. Suja, K. Susan John, and J. Sreekumar 2010 Soil test based nutrient management for short-duration cassava (Manihot esculenta): Analysis of growth, biomass, yield, quality, nutrient uptake and soil nutrient status Indian J. Agron 55 4

[5] A. Murdyastuti 2016 Aksesibilitas Petani Singkong terhadap Kebijakan Pemerintah dalam Mengentaskan Kemiskinan di Kabupaten Bondowoso Jawa Timur J. Strateg. dan Bisnis 4 2

[6] O. Igweoscar 2014 Effect of Contract Farming on Productivity and Welfare of Cassava-Based Farmers in South Eastern Nigeria Eur. J. Bus. Manag 6 7

[7] K. Murniati, W. A. Zakaria, T. Endaryanto, and L. S. M. Indah 2021 Analysis of production efficiency and income to support sustainability of cassava farming in Lampung Tengah District, Lampung Province IOP Conference Series: Earth and Environmental Science, 2021 739 1 doi: 10.1088/1755-1315/739/1/012048

[8] A. Mahmud 2019 Rekonstruksi Pemikiran Sajogyo Tentang Kemiskinan dalam Perspektif Agraria Kritis BHUMI J. Agrar. dan Pertanah 5 1 doi: 10.31292/jb.v5i1.322

[9] M. Iqbal, Agum, H. Lestari, Dyah, Aring, and A. Soelaiman 2014 Pendapatan dan Kesejahteraan Rumah Tangga Petani Ubi Kayu di Kecamatan Sukadana Kabupaten Lampung Timur J. Ilmu Ilmu Agribisnis 2 3

[10] Abdullah et al 2019 Determinants of commercialization and its impact on the welfare of smallholder rice farmers by using Heckman’s two-stage approach J. Saudi Soc. Agric. Sci 18 2 doi: 10.1016/j.jssas.2017.06.001

[11] W. A. Zakaria, T. Endaryanto, L. S. M. Indah, and A. Mutolib 2020 The Economic role of cassava in farmers’ households in Central Lampung Regency, Lampung Province E3S Web of Conferences, 2020 153 doi: 10.1051/e3sconf/202015303008

[12] K. Indira Putri, K. Murniati, R. Adawiyah Jurusan Agribisnis, F. Pertanian, U. Lampung, and J. Soemantri Brojonegoro No 2019 Pola Konsumsi Dan Tingkat Ketahanan Pangan Rumah Tangga Petani Ubi Kayu Di Kecamatan Terusan Nunyai Kabupaten Lampung Tengah Jia, 7 3

[13] S. Asfaw 2010 Estimating Welfare Effect of Modern Agricultural Technologies: A Micro-Perspective from Tanzania and Ethiopia Chronicpoverty.Org

[14] C. A. Afolami, A. E. Obayelu, and I. I. Vaughan 2015 Welfare impact of adoption of improved cassava varieties by rural households in South Western Nigeria Agric. Food Econ 3 1 doi: 10.1186/s40100-015-0037-2.

[15] A. Kolapo and A. J. Kolapo 2021 Welfare and productivity impact of adoption of biofortified cassava by smallholder farmers in Nigeria Cogent Food Agric 7 1 doi: 10.1080/23311932.2021.1886662.

[16] Wan Abbas Zakaria, Teguh Endaryanto, Muhammad Ibnu, and Lina Marlina 2019 Kesediaan Petani Melakukan Kemitraan Dimasa Datang: Analisis Heekprobit Pada Petani Ubi Kayu Di Provinsi Lampung J. Trop. Upl. Resour. (J. Trop. Upl. Res.) 1 1 doi: 10.23960/jtur.vol1no1.2019.7