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THE ROLE OF COFFEE COMMODITIES AS A BASE SECTOR FOR REGIONAL DEVELOPMENT IN CENTRAL ACEH REGENCY

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ABSTRACT

This study aims to analyze the role of the creation of added value of Arabica coffee to GRDP in Central Aceh Regency. The study was conducted in 2 sub-districts, Bies sub-district and Bebesen sub-district, where samples were taken proportionally to obtain 100 samples of Arabica coffee farmers. To answer these problems, an analysis is used for added value in the form of gross added value and added value of labor and input output analysis using a farm analysis approach. The results showed that the contribution of Arabica coffee farming to the overall GRDP in Central Aceh Regency was 53.41 percent, the workforce was 5.32 percent and the total was 58.73 percent of the GRDP.

KEYWORDS: ***value added, input output, multiplier effect, GRDP***

1. INTRODUCTION

History indicates that the discovery of coffee as a healthy and energy drink was first found by the Ethiopians on the African continent around 3000 years ago (1000 BC). Coffee continues to expand thus far as it has become one of the most popular drinks in the world consumed by various groups of people in Indonesia (Budiman, 2013).

Arabica coffee was grown in the Gayo Highlands about 1924, which was carried by the Dutch after the construction of the road from Birueen to Takengon in 1913. Arabica coffee was first cultivated in the village of Paya Tumpi, and then spread to Blang Gele, Burni Bius, Rediness, Bergendal and Paddy Lampahan, but their cultivation was still restricted to the Dutch people and only a few local aristocrats. Extensive agriculture started just at the beginning of the independence of the Republic of Indonesia in 1945 (Renes, 1989).

The biggest contributor to the GDP of the Agriculture sector in 2018 is the estate crops sub-sector. This sub-sector for the last four years has always been the biggest contributor to the agriculture sector. This is influenced by the existence of coffee plants as the main commodity of estate crops in Central Aceh District and is the most widely planted, so it requires a lot of labor in each coffee plantation in Central Aceh District.

The largest contributor to the agriculture sector's GDP in 2018 is the sub-sector of agricultural crops. Over the last four years, this sub-sector has also been the largest contributor to the agriculture market. This is motivated by the presence of coffee plants as the key product of agricultural crops in the Central Aceh Regency and is the most widely planted, demanding a lot of labor in each coffee plantation in the Central Aceh Regency.

Coffee plantation development activities, which involve a significant amount of labor and capital for the downstream industry, are expected to stimulate, grow, and create employment and business opportunities. They will have backward linkage through the economic activities that produce the goods and services needed during the coffee plantation process and the development of downstream industries. Other activities will arise as part of this activity, such as construction services, farm labor services, transport services, trade-in food

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and clothing, trade-in work equipment, and the materials and supplies required during the process. Post-harvest economic activities and production processes will have linkage forward. The service sector, including transport, coffee shops, cooperatives, banking, trade, small-scale industries in rural areas producing agricultural production packing equipment, is expected to emerge from the forward linkage process.

Gayo Arabica Coffee is a regional superior commodity that dominates smallholder farming in the central Aceh regency, where around 85 percent of the population depends on coffee plantations. In 2018, the coffee plant area of the Central Aceh Regency reached 50,3 thousand hectares, consisting of 42,9 thousand hectares, 4,8 thousand hectares old/damaged, and not 2,4 thousand hectares of coffee bean production rate of 32 thousand tons (BPS, Central Aceh Regency 2018).

Based on the height of the location, Arabica coffee plants are different between plants above 1,200 meters above sea level and plants at altitudes between 600 and 1,200 meters above sea level. In general, coffee planted above 1,200 meters above sea level is of better quality than coffee planted below 1,200 meters above sea level (Fatma 2011). Coffee plants in Central Aceh and Bener Meriah Regencies are intercropped with lamtoro, citrus, and avocado plants as shade plants and are used to avoid erosion.

The Bebesan subdistrict has an area of 47,19 km2 and is located at an altitude of 1,200-1,500 meters above sea level. Lemah Burbana is divided into 14 villages with the capital city of the Bebesan subdistrict. The North is bordered by the Kebangkan and Kute Panang Subdistricts, the East is bordered by the Bintang and Lut Tawar subdistricts, the South is bordered by the Pegasing and Lut Tawar subdistricts, the West is bordered by the Pegasing, Bies and Lut Tawar subdistricts.

Table 1
Land Use based on the Bebesen Subdistrict report 2018

Land Use	Area in Hectare
Rice field	68,9
Plantation	2150,5
Moorland	116
Grassland	0
Empty land	155
Protected forest	200
Non-agricultural land	1065
Total	3.755,4

Arabica coffee is the primary agricultural commodity in the Bebesen subdistrict. The area of Arabica coffee in the Bebesen subdistrict reached 2,133 hectares in 2018 and produced 1,315 tons. These production decreased by 1,429 tons compared to the previous year. Other commodities are fruit and horticulture.

The industries that thrived in Bebesen Subdistrict in 2018 were 12 agricultural and forestry industries and 227 multi industries. The agriculture and forestry sector in the Bebesen Subdistrict is a coffee plant in several villages.

The subdistrict of Bies has an area of 28,86 km2 and is located at an altitude of 1,250 meters above sea level. The capital of the subdistrict of Bies is Atang Jungket. Bies Subdistrict has borders, namely: North of Bebesan subdistrict, East of Pegasing subdistrict, South of Pegasing subdistrict, West of Silih Nara subdistrict.

Table 2
Land Use based on the Bebesen Subdistrict report 2018

Land Use	Area in Hectare
Rice field	80
Plantation	150
Moorland	96
Grassland	986
Empty land	449
Protected forest	5
Non-agricultural land	150
Total	400
Rice field	571
Plantation	2.886

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In the case of crop production, Bies subdistrict still has the highest production of Arabica coffee, producing 620.6 tons per year in 2018.

This article discusses the role of coffee commodities as a basis for regional development in the form of the value-added effects of multiplier input and output value added in the central Aceh regency.

Objective of the study

This study aims to analyze the role of the creation of added value of Arabica coffee to GRDP in Central Aceh Regency

2. RESEARCH METHODOLOGY

The study was conducted in Central Aceh Regency which consisted of 14 subdistricts, the area which was used as the research location of Bebesen and Bies subdistricts, the selection of subdistricts was based on the consideration that good management and maintenance of coffee plants, coffee quality, trade management and good cooperative management. Total population of 3,065 Arabica coffee farmers, sampling using the Slovin formula with a fault tolerance of 10 percent or (0.1) it can be counted as many as 96.84 rounded samples to 100 households.

Samples of farmers were taken purposively in selected villages, namely farmers who had planted arabica coffee long enough, 7 villages out of 28 villages in Bebesen sub-district namely Kebet, Blang Gele, Burbiah, Bahgie, Daling, Umang and Lelabu villages and as many as 6 villages from 12 villages in Bies sub-district namely Bies Penantanan, Bies Mulie, Uning Niken, Lenga, Arul Atong, and Pilar villages.

The method used is input-output analysis with a farm business analysis approach, i.e. agricultural business requires inputs, then a comparison is made between the magnitude of such production inputs in rupiah value and their contribution to the GRDP of the Central Aceh Regency.

3. LITERATURE REVIEW

In Indonesia, more than 90% of coffee plants are cultivated by smallholders. The implementation of the technologies used is still critical, which is why the production and quality of coffee is poor. To overcome this, the steps that farmers need to take are as follows (Najiyanti, 2008):

1. Develop superior varieties of arabica coffee on the appropriate soil.
2. Replacing old plants with new plants of superior varieties recommended (rejuvenation).
3. Applying the right cultivation techniques, both planting systems, pruning, fertilizing, pest control, plant diseases and shade management.
4. Implement the correct system of harvesting and processing, both the method of reaping, processing, drying, and sorting.

According to Hayami et. al (1987), value-added is the value-added of the commodity due to the functional input applied to the commodities concerned. The functional input is a form utility process, a place utility, and a time utility. Added value shows benefits for labor, modes, assets, and management. The Value Added Analysis aims to calculate the remuneration earned by system actors (processors) and the job opportunities that can be generated by the system. Added value is determined by both technological and non-technical influences (market factors). Technical factors are the quantity and quality of raw materials and accompanying inputs, the quality of the products, the application of technology, the production capacity and the use of labor components. Whereas market factors include the price of raw materials, the selling price of output, labor costs, investment capital, market information and other input values (other than fuel).

Input-output analysis is a comprehensive analysis of the regional economy by looking at the linkages between economic sectors in the region as a whole. Thus, if there is a change in the level of production of a particular sector, the impact on other sectors will be seen. The production function defines the relationship between inputs and outputs or explains the transformation of inputs (resources) to outputs (commodities). Symbolically, the output function can be written as: $Y = f(X_1, X_2, X_3, ..., X_n)$, where Y is the output, X_1 ... Xn is the input used for the production of Y (Debertin, 1986; Doll and Orazem, 1984; Saragih, 2012).

In the agricultural sector, Diskin (1997) introduces eight general indicators of agricultural productivity performance, such as yield per hectare, the gap between actual and potential crop yield, harvest variability under different conditions, production value per household, total monthly availability of household food, loss of crop yield during storage, area of land with improved cultivation, and the number of storage facilities built and used. The European Commission (2001) released production efficiency indicators that included: capital productivity, labor productivity, and land productivity. Partial productivity may be in the form of land productivity (output/ha), labor productivity (output/labor), and land labor (farm/labor) ratios. Input typically consists of land, labor, livestock, capital, and fertilizer (Saragih, 2012).

According to Moretti (2010), the multiplier effect can be determined based on consumer tastes, technology and the ability of workers and the income received by the community. The multiplier impact in the economic sector can be seen from the GRDP, the rise in people's wages, the ability to build or open up jobs for the community (Domanski and Gwosdz,

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2010). There is also a link between related sectors caused by the increase in demand for production in certain sectors (Tarigan, 2002).

Effective planning requires a systematic framework that identifies the stage for an optimal solution. The process must represent the principles of: systematic, effective, inclusive, informative, integrated, reasonable and transparent (Litman, 2011). Regional planning includes two main aspects, namely spatial planning and space activities related to space development in regional planning and related to social, cultural, institutional and ecological development planning activities (Tarigan, 2012; Sirodjuzilam and Mahalli, 2010). The main objective of local economic development (LED) is to promote local job opportunities in some sectors to enhance the welfare of the community through the use of human and natural resources. LED is process-oriented by creating new organizations, alternative industries, enhancing workforce capacity, finding new markets, transferring expertise, and retaining new businesses and enterprises (Blakely 1994).

4. RESULT

Creation of Coffee Value Added to GRDP in the Central Aceh Regency

Table 3
Transactions based on input prices at the cooperative/exporter level

No	Description of activities	Input	Output	Profit	Added Value	Value Added 1 Ton Production
1	**New Planting**	**28.065.000**	**-**	**-**	**1.740.000**	**8.700.000**
2	Farmer Producers	**28.587.000**	34.320.000	**5.732.000**	**19.412.500**	**9.174.500**
3	Village/Local Trader	**44.559.100**	**78.721.215**	**34.162.115**	**30.960.000**	**13.599.100**
4	**Cooperative / Exporter**	**530.373.500**	**2.759.665.658**	**2.280.220.808**	**2.229.292.158**	**50.928.650**
	TOTAL	631.584.600	2.872.706.873	2.320.114.923	2.281.404.658	82.402.250

Source: Processed Data

Table 3 shows the total inputs, total output, total profits, total value-added, and the total value added of 1 (one) ton of coffee plant production. From the table above, we can obtain the total value-added received by coffee firms, both farmers and traders (collectors) in one year is IDR 2.281 million, with a total value-added per 1 ton of IDR 82.40 million.

Table 4
Value Added Workforce at Farmers Level in Central Aceh Regency 2019 per hectare per year

Workforce	Total (person)		Length of Work/day (Hours)	Total of length of work (hours)
Weeding and Mulching (3 months x 1 times x 2 people)	8	HOK	8	64
Fertilization (3 months x 1 times x 2 people)	8	HOK	8	64
Pruning (3 months x 1 times x 2 people)	8	HOK	8	64
Pest/Disease Control (1 mth x 1 times x1 people)	12	HOK	8	96
Crop Picker (3 months x 1 times 3 people)	12	HOK	8	96
Fruit Stripping	3	HOK	8	24
Post-harvest	5	HOK	8	40
Drying	2	HOK	8	16
Length of Work (hours/day)				**464**
Gross Value Added (IDR)				**19.412.500**
Value Added Labor (IDR/hours)				**41.837,28**
Value Added 1 Ton Production (IDR)				**14.628**

Source: Primary Data (2019)

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Table 4 indicates that the amount of employees required in the production of Arabica coffee plantations per hectare is 58 HOK, the length of work is 8 hours a day, and the total working period is 464 hours. The average NTtk is IDR 41,837.28 / JKO. It means that every one hour of work can provide an added value of IDR 41,837.28, and if it is 1-ton productions, it has an added-value of around IDR 14,628. The value-added of farm labor suggests that the coffee plantation sector contributes to the GRDP in the Central Aceh Regency.

Table 5
Value Added Labor at Village Traders / Collector Levels in Central Aceh Regency 2019

Workforce	Total (person)		Length of Work/day (Hours)	Total of length of work (hours)
Coffee Bean Milling	15	HOK	8	120
Coffee Bean Drying	12	HOK	8	96
Coffee Bean Grinding to the Mill	4	HOK	8	32
Labu Drying	12	HOK	8	96
Length of Work (hours/day)				**344**
Gross Value Added (IDR)				**30.960.000**
Value Added Labor (IDR/hours)				**90.000**
Value Added 1 Ton Production (IDR)				**17.100**

Source: Primary Data (2019)

Table 5 shows that the amount of workers employed in the production of Arabica coffee plantations per hectare is 43 HOK, the length of work is 8 hours per day, and the total working period is 344 hours. The average NTtk is 90,000 IDR / JKO. It means that 90,000 IDRs can be to anyone's hour of work. And if it is 1 ton of production, it has an added-value of about Rp. 17,100 Value-added labor at the village trader level indicates that the coffee marketing service business is a backward linkage effect and contributes to the GRDP in the Central Aceh Regency.

Table 6
Value Added Workforce at the Cooperative / Exporter Traders Level in Central Aceh Regency 2019

Workforce	Total (person)		Length of Work/day (Hours)	Total of length of work (hours)
Coffee Bean Milling	15	HOK	8	120
Coffee beans drying	25	HOK	8	200
Grain Grinding to the Mill	8	HOK	8	64
Drying the output of the mill	25	HOK	8	200
Length of Work (hours/day)				**584**
Gross Value Added (IDR)				**2.229.292.158**
Value Added Labor (IDR/hours)				**3.817.281**
Value Added 1 Ton Production (IDR)				**45.228**

Source: Primary Data (2019)

Table 6 shows that the number of workers employed per hectare in Arabica coffee plantations was 73 HOK, the length of work is 8 hours per day, and the total working hours were 584 hours. Average NTtk of IDR 3,817,281 / JKO means that every one hour of work will have an added value of IDR 3,817,281 and have added value for 1 ton of IDR 45,228 output. The magnitude of the added-value of labor at the subdistrict's trader level indicates that the coffee marketing service sector is the backward linkage effect of the coffee plantations and contributes to the GRDP of the Central Aceh Regency.

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Table 7
GRDP based on constant prices (ADHK) in the Central Aceh Regency 2018.

Sector	2018	Percentage
1. Agriculture	**2.430.451,7**	**100,00**
a. Food plants	781.281,9	32,14
b. Plantation	**1.127.111,4**	46,37
c. Farming	185.209,6	7,62
d. Forestry	311.128,3	12,80
e. Fishery	25.720,5	1,05
2. Transportation and Communication	**389.815,2**	**100,00**
a. Transportation	**230.500,8**	59,13
Land transportation	227.756,0	98,80
Transportation support services	2.744,8	1,19
b. Information and Communication	**159.314,4**	**40,86**
3, Finance, Real Estate & Corporate Services	**293.335,8**	**100,00**
a. Finance	104.635,2	35,67
b. Non-bank financial institutions	188.700,6	64.32
GRDP with Oil and Gas	**3.503.417,9**	
GRDP without Oil and Gas	**3.503.417,9**	

Source: Central Aceh Regency/ BPS (2018)

Table 7 shows that the agriculture, animal husbandry, forestry, and fisheries sectors were the economic sectors with the highest contribution to the Central Aceh Regency GRDP of 69.37 percent, and the plantation subsector contributed 46.37 percent, food crops 32.14 percent, forestry 12.80 percent, and fisheries 1.07 percent to the agricultural sector. It shows that the plantation sub-sector is the leading sub-sector of the Central Aceh Regency. Other sectors that play a role in plantations are the transportation and communication sector, the contribution of the transportation subsector by 59.13 percent, and communication by 40.86 percent. Road transportation contributes 98.80 percent, the high contribution of road transportation subsector is due to the fact that there is no alternative transportation other than land transportation. The role (share) of productive activities can be seen from its ability to increase community income and employment in the region.

Table 8
The role of Arabica Coffee Commodities in the Revenue and Workforce Absorption of the Central Aceh Regency in 2019

Regional Revenue 2018			
1	Central Aceh Regency GRDP	(IDR million)	3.503.417
2	GRDP Agriculture Sector	(IDR million)	2.430.451
3	GRDP Plantaton Sector	(IDR million)	1.127.111
4	The Role of Arabica Coffee		
	a. Farmer Profit	(IDR/ha/year)	38.202
	b. Production Area	(ha)	2.514
	c. Agriculture Revenue (axb)	(IDR/ha/year)	96.039
	d. Workforce Absorption	(IDR/ha/year)	13.920
	e. Total Benefit (c+d)	(IDR/ha/year)	109.959
5	GRDP Share in Central Aceh (e:1)	(%)	3.13
6	Share in Agriculture GRDP (e:2)	(%)	4,52
7	Share in Plantation GRDP (e:3)	(%)	9,75
Workforce Absorption 2018			
8	Central Aceh Regency Level	(orang)	65.414

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9	Agriculture Sector Level	(orang)	32.714
10	Plantation Subsector Level	(RT)	18.328
11	Arabica coffee farming level in Bebesan and Bies Subdistricts	(RT)	5.103
The role of arabica coffee			
12	Share at Central Aceh Regency Level (11:8)	(%)	7,76
13	Share at Agriculture Level (11:9)	(%)	15,60
14	Share at Plantation Level (11:10)	(%)	27,84

Source: Primary Data and Statistics of Central Aceh Regency (2019)

Table 8 shows that the Arabica coffee share of farmers in the Central Aceh Regency GRDP of 38.2 million or 3.13 percent, the share of Arabica coffee in the agricultural sector GRDP of 4.52 percent and the share of Arabica coffee in the GRDP of the plantation sub-sector by 9 , 75 percent. The share of the Arabica coffee farmer (TK) to Bebesan and Bies sub-district on employment is 7.76 percent, the Arabica coffee farmer workforce share to the employment of 15.60 percent to the agricultural sector and workforce share (TK) of Arabica coffee farming on employment of 27.84 percent of the plantation subsector

The Arabica coffee share shows that the creation of the Central Aceh Regency GRDP is strongly influenced by Arabica coffee, this role demonstrates its ability to increase community income and employment, the role of Arabica coffee in the GRDP of the agricultural sector, regional income, and plantation subsector employment, the agricultural sector and total employment in the Central Aceh regency.

Table 9
Recapitulation of Arabica Coffee Added Value

No	Description of activity	Added-Value/Ha/Year	Area/Volume Ha/Ton	Total of Value-added
1	**New Planting**	**1.740.000**	**1 Ha**	**8.700.000**
2	Farmer Producers	**19.412.500**	**2,86 Ton**	**9.174.500**
3	Village/Local Trader	**30.960.000**	**5,263 Ton**	**13.599.100**
4	**Cooperative / Exporter**	**2.229.292.158**	**84,4 Ton**	**50.928.650**
	Total			**82.402.250**

Source: Processed Data

Table 9 is a recapitulation table of the value-added of Arabica coffee consisting of new planting activities with a total value-added of IDR 8.7 million, producer farmers IDR 9.1 million, village traders IDR 13.5 million, and cooperatives/exporters IDR 50.2 million. The value of IDR 82.40 million added to the GRDP for Central Aceh Regency.

Table 10
Recapitulation of Arabica Coffee Employment

No	Uraian Kegiatan	Number of Employment	Area/Volume Ha/Ton	Total Employment
1	**New Planting**	**29 HOK**	**1 Ha**	**29 HOK**
2	Farmer Producers	**57 HOK**	**2,86 Ton**	**57 HOK**
3	Village/Local Trader	**43 HOK**	**5,263 Ton**	**43 HOK**
4	**Cooperative / Exporter**	**73 HOK**	**84,4 Ton**	**73 HOK**
	TOTAL			**202 HOK**

Source: Processed Data

Table 10 shows the recapitulation table of Arabica coffee employment starting from new planting 29 HOK, 57 HOK producing farmers, 43 HOK village traders, and 73 HOK cooperatives / exporters so the total employment is 202 HOK. The value added of labor shows that Arabica coffee

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farming contributes to the GRDP in Central Aceh Regency.

5. CONCLUSION

Based on the results of this study, several conclusions on the role of coffee commodities as a base sector for regional development in the central Aceh regency, as follows:

1. The added value of Arabica coffee plantations contributed 9.75% to the Central Aceh Regency GRDP.
2. Arabica coffee plantation activities absorb or create employment up to 29 working days (HOK) for new plantings, 58 working days (HOK) for producer farmers, 43 working days (HOK) for village traders, while cooperatives/exporters absorb workforce up to 73 working days (HOK) per hectare. The added-value of labor in the Central Aceh District level contributed 7.76%, in the plantation sector contributed 27.8%, this indicates that the coffee plantation sector contributed to the GRDP in Central Aceh Regency.

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