



<https://ojs.unud.ac.id/index.php/soca>

## The Transformation of Agriculture, Forestry and Fisheries Sectors in the Indonesian Economy

Abi Pratiwa Siregar<sup>1</sup>, Edy Rahmantyo Tarsilohadi<sup>2</sup> and Nadia Oktaviana<sup>1</sup>

<sup>1</sup>Faculty of Agriculture, Gadjah Mada University, Special Region of Yogyakarta

<sup>2</sup>Faculty of Economic and Business Bengkulu University, Bengkulu Province

Correspondence E-mail: [abipratiwasiregar@ugm.ac.id](mailto:abipratiwasiregar@ugm.ac.id)

Submitted : July 31<sup>th</sup>, 2020 ; Revised : August 28<sup>th</sup>, 2020; Accepted: September 8<sup>th</sup>, 2020

### Abstract

#### **Keywords:**

Agriculture sector contribution, Shift Share analysis, Agriculture sector transformation, forestry, and fisheries.

As time goes by, the role of the agriculture, forestry and fisheries sectors in the Indonesian economy tended to decrease. This was inseparable from the development of industrialization and digitalization. However, it was difficult to find studies that provide information on how much this transformation happened, especially at the provincial level. Therefore, this research aims to determine how much the shifting in the agricultural, forestry and fisheries sectors in each province so that describe the sectoral transformations that occurred at the national level. The basic method in this research was descriptive analytical using secondary data from the Central Bureau of Statistics from 2010 to 2019. The analytical tools that used were Location Quotient (LQ) and Dynamic Location Quotient (DLQ), and shift share analysis. The results showed that more than fifty percent of the total 34 provinces in Indonesia relied on the non-agricultural sector. Nationally, the agriculture, forestry and fisheries sectors ranked fourth after the manufacturing, wholesale and retail industries; auto and motorcycle repair, and construction. In response to this, it was necessary to increase land productivity and increase the capacity of human resources in a sustainable manner. This aimed to maintain food security and prepare human resources to be more skilled in order to adapt to the shifting economic

---

structures.

---

How to Cite (APA 6th Style):

Siregar, A. P., Tarsilohadi, E. R., & Oktaviana, N. (2021). The Transformation of Agriculture, Forestry and Fisheries Sectors in the Indonesian Economy. *SOCA: Jurnal Sosial Ekonomi Pertanian*, 15(3), 518 - 530. <https://doi.org/https://doi.org/10.24843/SOCA.2021.v15.i03.p09>

## INTRODUCTION

The productivity of the agriculture, forestry and fisheries sectors can be determined through the achievement of gross domestic product (regional) each year (Suharyanto et al., 2016). According to Khairiyakh et al., (2015), in the past 20 years, the productivity of the agriculture, forestry and fisheries sectors had shown a positive trend, but the contribution to the total Gross Domestic Product (GDP) tended to decrease. This was in line with Kuznets' theory that the occurrence of structural transformation was marked by the large contribution of the agricultural sector to the industrial sector, manufacturing, until service sector (Roosmawarni & Soekarnoto, 2015).

The dynamics of economic sector development that can reflect how structural transformation occurred can be identified using shift share analysis (Kesuma & Utama, 2015). Abidin (2015) used shift share analysis and found that the growth of the agricultural sector in Southeast Sulawesi was slower than the national agricultural sector. Meanwhile, Hajeri et al., (2015) with the same analysis tool, found that there had been a change in the economic structure in Kubu Raya from the manufacturing sector (secondary) to the transportation and communication sector (tertiary) then to the agricultural sector (primary). Habibullah & Radam (2009) used LQ and DLQ, as well as shift share analysis to determine the concentration of industry in rich and poor regions in Malaysia. The results of his research showed that in the areas classified as poor, the economic driver sector was agriculture. Meanwhile, in the areas classified as rich, the main contributor to economic growth was manufacturing.

Darma Putra and Yuli Pratiwi (2019) stated that the contribution of a sector will show how much the dependency of economic development in the region. In Kalimantan Island, due to the availability of abundant natural resources, the economy in this region was dominated by the agriculture, forestry and fisheries; mining and quarrying; and manufacture sectors. However, based on LQ analysis, Klassen Classification Typology, shift share and overlay, it was known that the sectors that have the greatest potential to come forward in the future were the manufacturing and construction industries.

The previous studies generally identified sectoral transformations using LQ, DLQ, and shift share analysis in an area for provincial/regency/city areas only or conducted research at the provincial and national levels, but only used leading and prospective sector parameters. Until now, there has been no study on the transformation of the agriculture, forestry and fisheries sectors in the Indonesian economy based on the developments in all provinces (a total of 34 provinces). This

was the novelty of this research. The novelty intent were: 1) presenting the latest data related to the development of the agriculture, forestry and fisheries sectors at the provincial and national levels, 2) calculating the contribution of the agricultural, forestry and fisheries sectors at the provincial and national levels, and 3) identifying transformation of the agricultural, forestry and fisheries sectors in all provinces in Indonesia.

The aims of this research were to: 1) determine the development of the agricultural, forestry and fisheries sectors at the provincial and national levels, 2) identify the basic/non-basic and prospective/non-prospective sectors at the provincial level, and 3) identify the transformation of the agricultural, forestry and fisheries sectors in Indonesia referred to the developments in each province.

**RESEARCH METHODS**

This research used secondary data that came from Central Bureau of Statistics. The data that used was Gross Domestic Product (GDP) and Gross Regional Domestic Product (GRDP) at constant prices for base year 2010 in 34 provinces in Indonesia from 2010 to 2019. To answer the first objective, the GDP/GRDP growth calculation was used (equation (1) and the contribution of the agricultural, forestry and fisheries sectors at the provincial and national levels (equation (2)) (Mandatari et al., 2020).

$$g = \left( \frac{Y_t - Y_{t-1}}{Y_{t-1}} \right) \times 100 \dots\dots\dots (1)$$

$$k = \left( \frac{x}{y} \right) \times 100 \dots\dots\dots (2)$$

Information: g = economic growth;  $Y_t$  = GDP/GRDP in the year of t;  $Y_{t-1}$  = GDP/GRDP in the year of t-1; k = contribution of Agricultural sector in the regional/national level; x = GDP/GRDP Agricultural sector; y = Total GDP/GRDP in the regional/national level

The second objective was discovered by using LQ and DLQ analysis (equation (3) and (4)) (Antara, 2007; Widianingsih et al., 2015). Meanwhile, *shift share analysis* (equation (5)) used to answer the third objective (Abidin, 2015; Hajeri et al., 2015).

$$LQ = \frac{X_{ij} / RV_j}{X_i / RV} \dots\dots\dots (3)$$

Information: LQ = Index/coefficient *Location Quotient* sector i in province j;  $X_{ij}$  = GRDP sector i in province j;  $X_i$  = GDP sector i;  $RV_j$  = Total GRDP province j;  $RV$  = Total GDP.

Assessment Criteria: If  $LQ < 1$ , non-basic sector; If  $LQ > 1$ , basic sector; If  $LQ = 1$ , then the domestic product owned by province j was completely consumed in that area.

$$DLQ = \left( \frac{(1+g_{ik}) / (1+g_k)}{(1+g_{tp}) / (1+g_p)} \right)^t \dots\dots\dots (4)$$

Information: DLQ = Index/coefficient *Dynamic Location Quotient* sector i in province j; gik = average growth of GRDP sector i in province k; gk = total average growth of GRDP in province k; gtp = average growth of GDP sector i; gp = total average growth of GDP; t = time (year).

Assessment Criteria:  $DLQ > 1$  = prospective;  $DLQ < 1$  = not prospective; If  $DLQ = 1$ , then the development potency for sector i was the same with the mutual sector in the reference area.

$$D_{ij} = N_{ij} + M_{ij} + C_{ij} \dots\dots\dots (5)$$

Information:  $D_{ij}$  = net shifting in sector i in region j;  $N_{ij}$  = growth of sector i in region j;  $M_{ij}$  = industrial mix in sector i in region j;  $C_{ij}$  = competitive predominance sector i in region j.

Assessment Criteria = First, if the value of  $D_{ij}$  positive/negative, then the sector was classified as progressive/slow. Second, the shifting of economic structure was indicated by  $D_{ij}$  value sector i compared to the  $D_{ij}$  value other sectors in the same region.

## RESULTS AND DISCUSSION

### The development of Agriculture, Forestry and Fisheries Sectors in Provincial and National Level

The development of the agriculture, forestry and fisheries sectors in this research was divided into two aspects, which were sectoral growth and contribution to GRDP/GDP. If viewed from a regional perspective, the growth in the agricultural, forestry and fisheries sectors above the national average was dominated by areas in Sulawesi, Kalimantan and Sumatra. If compared between regions with lower growth and areas above the national average, it was known that the determining element was the activity in each region. The Java Island, which dominated the growth of the agricultural sector, was below the national average, the most commonly cultivated commodities were food and horticultural crops, while most of the provinces in Sulawesi, Kalimantan and Sumatra were concentrated on plantation crops.

According to Daulay et al. (2016) stated that the additional value produced by plantation crops was relatively greater than food crops. Therefore, instead of continuing to cultivate rice, producers tend to choose plantation crops because they provided a higher relevant income.

**Table 1. The Growth of Agriculture, Forestry and Fisheries Sectors in Provincial and National Level, 2011 – 2019 (%)**

No	Province	Year									Average
		2011	2012	2013	2014	2015	2016	2017	2018	2019	
1	A	3,66	4,41	4,68	2,45	5,04	3,75	5,25	4,03	3,54	4,09
2	B	5,88	5,31	4,71	4,37	5,57	4,65	5,31	4,87	5,13	5,09
3	C	4,61	2,63	3,72	5,86	4,34	2,01	3,43	3,54	2,63	3,64
4	D	3,46	3,82	4,40	6,15	0,43	3,96	5,29	4,46	4,12	4,01
5	E	4,73	6,81	6,21	10,95	5,46	6,36	5,37	3,18	2,16	5,69
6	F	5,40	6,07	5,26	4,06	3,59	1,36	1,18	2,16	3,28	3,59
7	G	4,18	5,53	4,03	2,46	2,26	3,16	3,27	3,19	3,47	3,51
8	H	5,38	3,93	4,63	3,28	3,49	3,11	0,86	1,01	1,34	3,00
9	I	8,94	6,47	6,85	9,22	5,93	4,34	-0,30	5,45	2,89	5,53

No	Province	Year									Average
10	J	3,93	2,36	4,29	7,56	5,78	5,79	-1,21	-2,85	-0,70	2,77
11	K	0,13	3,29	2,60	0,47	1,14	0,88	0,29	0,21	0,34	1,04
12	L	-0,79	0,03	4,50	0,29	0,16	5,70	1,60	2,11	2,83	1,83
13	M	3,83	3,04	2,15	-0,95	5,60	2,20	1,82	2,62	1,36	2,41
14	N	-1,63	5,13	2,26	-2,10	2,11	1,46	1,93	2,16	1,03	1,37
15	O	4,02	5,14	3,06	3,54	3,28	2,41	1,58	-2,09	1,10	2,45
16	P	3,01	3,20	6,73	2,45	6,61	6,58	4,28	3,58	2,21	4,30
17	Q	1,03	4,37	2,20	4,66	2,68	3,53	2,73	5,06	3,79	3,34
18	R	5,04	4,56	3,29	4,46	6,91	3,38	6,53	1,94	1,51	4,18
19	S	2,02	2,98	2,72	3,61	3,26	2,42	4,94	3,03	3,75	3,19
20	T	3,76	4,08	5,17	2,32	2,42	4,08	6,55	6,68	5,85	4,54
21	U	1,65	2,62	3,38	7	5,35	4,40	4,52	6,94	7,17	4,78
22	V	2,56	3,11	3,29	4,47	2,41	3,67	4,09	3,76	3,78	3,46
23	W	5,31	7,62	6,44	6,78	4,55	0,46	5,66	6,14	3,88	5,20
24	X	na	na	na	Na	na	5,22	4,45	5,95	5,78	5,35
25	Y	-1,03	6,29	6,56	3,47	2,54	3,67	4,46	3,55	5,87	3,93
26	Z	6,08	5,85	5,66	6,76	6,35	2,40	4,46	4,32	2,20	4,90
27	AA	6,89	4,58	4,93	10,02	5,87	7,86	5,56	5,27	2,80	5,98
28	AB	1,94	4,41	6,04	9,11	0,04	7,93	5,76	6,37	5,02	5,18
29	AC	5,75	7	6,93	6,44	4,24	6,43	9,06	7,60	6,32	6,64
30	AD	8,40	7,32	5,71	5,93	5,74	4,08	6,51	6,10	4,62	6,05
31	AE	3,04	6,23	4,13	6,08	1,25	4,82	5,91	4,57	5,80	4,65
32	AF	4,29	6,47	3,54	3,02	1,72	4,25	3,16	4,12	4,03	3,84
33	AG	-6,27	4,42	6,37	4,97	2,60	2,12	5,85	2,20	3,34	2,85
34	AH	3,87	6,18	6,04	5,64	5,26	1,77	3,94	3,15	0,25	4,01
	<b>National</b>	<b>3,95</b>	<b>4,59</b>	<b>4,20</b>	<b>4,24</b>	<b>3,75</b>	<b>3,37</b>	<b>3,92</b>	<b>3,89</b>	<b>3,64</b>	<b>3,95</b>

Source: Processed from Secondary Data (2020)

Information: na = data not available

Province Code : A = Aceh; B = North Sumatera; C = West Sumatera; D = Riau; E = Jambi; F = South Sumatera; G = Bengkulu; H = Lampung; I = Bangka Belitung Islands; J = Riau Islands; K = Special Capital Region of Jakarta; L = West Java; M = Central Java; N = Special Region of Yogyakarta; O = East Java; P = Banten; Q = Bali; R = West Nusa Tenggara; S = East Nusa Tenggara; T = West Kalimantan; U = Central Kalimantan; V = South Kalimantan; W = East Kalimantan; X = North Kalimantan; Y = North Sulawesi; Z = Central Sulawesi; AA = South Sulawesi; AB = South-East Sulawesi; AC = Gorontalo; AD = West Sulawesi; AE = Maluku; AF = North Maluku; AG = West Papua; AH = Papua

**Table 2. The Contribution of Agriculture, Forestry and Fisheries Sectors in Provincial and National Level, 2011 – 2019 (%)**

No	Province	Year									Average
		2011	2012	2013	2014	2015	2016	2017	2018	2019	
1	A	25,28	25,42	25,93	26,16	27,68	27,80	28,09	27,93	27,77	26,90
2	B	25,65	25,38	25,05	24,85	24,96	24,84	24,88	24,81	24,79	25,02
3	C	25,55	24,67	24,12	24,11	23,84	23,10	22,69	22,34	21,83	23,58
4	D	22,99	23,00	23,43	24,22	24,27	24,69	25,33	25,84	26,16	24,44
5	E	25,32	25,26	25,12	25,96	26,27	26,77	26,97	26,56	25,99	26,02
6	F	19,44	19,30	19,29	19,16	19,01	18,34	17,59	16,94	16,55	18,40
7	G	32,13	31,74	31,13	30,24	29,42	28,82	28,35	27,87	27,47	29,69
8	H	34,18	33,38	33,02	32,45	31,95	31,33	30,05	28,84	27,76	31,44
9	I	17,47	17,64	17,91	18,69	19,02	19,07	18,20	18,37	18,29	18,30
10	J	3,94	3,74	3,64	3,68	3,67	3,70	3,58	3,33	3,15	3,60

No	Province	Year										Average
11	K	0,11	0,11	0,10	0,10	0,09	0,09	0,09	0,08	0,08	0,09	
12	L	9,15	8,60	8,45	8,06	7,69	7,69	7,42	7,17	7,02	7,92	
13	M	15,75	15,41	14,98	14,09	14,11	13,70	13,25	12,92	12,42	14,07	
14	N	10,48	10,46	10,14	9,44	9,19	8,87	8,59	8,26	7,83	9,25	
15	O	13,17	12,98	12,61	12,34	12,08	11,72	11,29	10,48	10,04	11,86	
16	P	5,93	5,73	5,74	5,57	5,63	5,70	5,62	5,50	5,33	5,64	
17	Q	16,26	15,87	15,20	14,90	14,43	14,05	13,68	13,51	13,28	14,58	
18	R	23,29	24,73	24,29	24,13	21,18	20,70	22,03	23,51	22,94	22,98	
19	S	30,74	30,02	29,26	28,86	28,40	27,67	27,63	27,07	26,70	28,48	
20	T	24,55	24,13	23,93	23,31	22,76	22,52	22,82	23,17	23,35	23,39	
21	U	23,42	22,49	21,65	21,81	21,47	21,08	20,65	20,90	21,10	21,62	
22	V	15,40	14,98	14,70	14,64	14,44	14,34	14,18	14,00	13,96	14,52	
23	W	5,47	5,59	5,82	6,11	6,47	6,52	6,68	6,91	6,85	6,27	
24	X	na	na	na	na	na	na	17,28	17,26	17,08	17,21	
25	Y	22,13	22,02	22,05	21,46	20,74	20,25	19,90	19,44	19,48	20,83	
26	Z	36,44	35,22	33,96	34,50	31,77	29,59	28,86	28,33	27,02	31,74	
27	AA	22,79	21,89	21,35	21,84	21,57	21,66	21,33	20,97	20,16	21,51	
28	AB	26,16	24,46	24,13	24,78	23,19	23,50	23,28	23,27	22,95	23,97	
29	AC	37,92	37,60	37,34	37,05	36,36	36,33	37,12	37,51	37,48	37,19	
30	AD	42,65	41,90	41,42	40,31	39,72	39,00	39,04	38,99	38,61	40,18	
31	AE	25,37	25,16	24,89	24,76	23,77	23,55	23,58	23,28	23,33	24,19	
32	AF	25,66	25,53	24,86	24,27	23,27	22,93	21,97	21,20	20,78	23,39	
33	AG	10,69	10,77	10,67	10,63	10,47	10,23	10,41	10,02	10,08	10,44	
34	AH	11,44	11,94	11,66	11,89	11,66	10,87	10,80	10,37	12,34	11,44	
<b>National</b>		<b>13,64</b>	<b>13,45</b>	<b>13,28</b>	<b>13,18</b>	<b>13,04</b>	<b>12,84</b>	<b>12,69</b>	<b>12,54</b>	<b>12,37</b>	<b>13</b>	

Source: Processed from secondary data (2020)

Information: na = data not available

The provinces of Aceh, Riau, Jambi, Bangka Belitung Islands, and North Kalimantan recorded an increase in the contribution of the agriculture, forestry and fisheries sectors to GRDP from 2011 to 2019. During the same period, the agriculture, forestry and fisheries sectors in the five provinces contributed more to GRDP than the contribution of the same sector to GDP. Among the existing sub-sectors, food crops played an important role in achieving this performance. Since the last five years (2014 - 2018), food crops at the provincial level had experienced a higher productivity increase compared to the same parameters at the national level, with the following details: The productivity of rice, corn, soybeans, peanuts, green beans, cassava, and wet sweet potato at the national level, each grew by 0.57%, 0.29%, -1.07%, 0.94%, 0.12%, 10.36%, and 28.21%. Meanwhile, at the provincial level, the achievements were as follows: Aceh (5.9%, 1.15%, 1.46%, 1.21%, 0.65%, 28.01%, 29.35%), Riau (4.9%, 0.37%, 1.26%, 3.12%, 0.13%, 55.21%, 2.74%), Jambi (3.99%, 1.83%, 2.18%, 1.24%, -0.07%, 86.8%, 13.51%). For the Province of Bangka Belitung Islands, the increase in productivity was higher for soybean, peanut, cassava and sweet potato. Meanwhile, in North Kalimantan Province, the increase in productivity was greater for every commodity except rice.

According to Gollin (2010), the agricultural sector had a strategic role in developing countries; one example was the contribution to the economy. However, this role needed to be examined carefully. This was because the productivity of the agricultural sector was relatively lower than other economic sectors. Therefore, striving to increase the contribution on this sector was not always linear with economic growth.

### Basic/Non Basic Sectors and Prospective/Not Prospective Sectors in Provincial Level

The agriculture, forestry and fisheries sectors were dynamic and were influenced by many variables in their development. Therefore, information was needed on the future prospects of this sector by looking at the existing performance records. Based on DLQ calculations, the agriculture, forestry and fisheries sectors were not prospective sectors in most regions in Indonesia (20 from total 34 provinces).

The provinces of Aceh, North Sumatra, Riau, Jambi, Bangka Belitung Islands, West Nusa Tenggara, West Kalimantan, North Kalimantan, South Sulawesi, Gorontalo, West Sulawesi and Maluku have agriculture, forestry and fisheries sectors which were included in the superior category. This was because in those twelve provinces, the growth and contribution of the agriculture, forestry and fisheries sectors continued to grow from year to year. On the other hand, in the provinces of Riau Islands, Special Capital Region of Jakarta, West Java, Special Region of Yogyakarta, East Java, and West Papua, the agriculture, forestry and fisheries sectors were categorized as underdeveloped. The reason was the growth and contribution of this sector continued to decrease from time to time.

The results of this research were in line with the result study of (Ali & Ahmad, 2009). Whereas, each region in a country had variations to the basic and non-basic sectors. In Malaysia, of the 12 countries that were grouped into 4 areas (north, center, east, and south), there were various sectors that were the main drivers of the economy. In the southern area, manufacturing was the sector with the highest LQ score. This was followed by the mining and quarrying sector with an increasing trend in the LQ score. Furthermore, in Sabah, Sarawak, and W.P. Labuan, the main contributor was agriculture and mining and quarrying. However, the trend in these two sectors tended to decrease. On the other hand, in the agriculture and service industries were the main drivers of Kedah and Kelantan regions.

**Table 3. LQ and DLQ of Agriculture, Forestry and Fisheries Sectors Based on the Provinces in Indonesia**

No	Province	LQ	DLQ	Quadrant	Description
1	A	2,07	83,71	I	Basic Prospective
2	B	1,93	4,53	I	Basic Prospective
3	C	1,81	0,35	III	Basic Not Prospective
4	D	1,88	122,08	I	Basic Prospective
5	E	2	8,85	I	Basic Prospective
6	F	1,41	0,37	III	Basic Not Prospective
7	G	2,28	0,29	III	Basic Not Prospective
8	H	2,42	0,11	III	Basic Not Prospective
9	I	1,44	28,96	I	Basic Prospective
10	J	0,28	0,06	IV	Non Basic Not Prospective
11	K	0,01	0,0001	IV	Non Basic Not Prospective
12	L	0,61	0,0039	IV	Non Basic Not Prospective
13	M	1,08	0,04	III	Basic Not Prospective
14	N	0,71	0,0011	IV	Non Basic Not Prospective
15	O	0,91	0,02	IV	Non Basic Not Prospective

No	Province	LQ	DLQ	Quadrant	Description
16	P	0,43	0,75	IV	Non Basic Not Prospective
17	Q	1,12	0,08	III	Basic Not Prospective
18	R	1,77	28,38	I	Basic Prospective
19	S	2,19	0,26	III	Basic Not Prospective
20	T	1,80	2,83	I	Basic Prospective
21	U	1,66	0,78	III	Basic Not Prospective
22	V	1,12	0,55	III	Basic Not Prospective
23	W	0,48	902,03	II	Non Basic Prospective
24	X	1,37	2,08	I	Basic Prospective
25	Y	1,60	0,29	III	Basic Not Prospective
26	Z	2,44	0,09	III	Basic Not Prospective
27	AA	1,65	1,46	I	Basic Prospective
28	AB	1,84	0,43	III	Basic Not Prospective
29	AC	2,86	6,05	I	Basic Prospective
30	AD	3,09	1,71	I	Basic Prospective
31	AE	1,86	1,33	I	Basic Prospective
32	AF	1,80	0,16	III	Basic Not Prospective
33	AG	0,80	0,30	IV	Non Basic Not Prospective
34	AH	0,88	235,30	II	Non Basic Prospective

Source: Processed from secondary data (2020)

### The Transformation of Agriculture, Forestry and Fisheries Sectors in Indonesia

The identification of the transformation of the agricultural sector was known to use the net shifting value (Dij) as the sum of the national growth components (Nij), proportional growth components (Mij), and competitive predominance components (Cij). Based on the information in Table 4, it can be seen that the Nij score was relatively greater than Mij and Cij, resulting in a positive Dij score. This was a bias in the calculation of shift share, due to the fact that the agricultural, forestry and fisheries sectors had shifted in the last 10 years, as previously explained in the discussion of growth and sectoral contributions.

Therefore, drawing conclusions to answer the third objective used the calculation of net shifting (Dij) for all economic sectors (a total of 17 sectors based on business field categories by BPS) in each province. The results of the Dij calculation for each sector were then sorted from the highest to the lowest value in each province then placed in sequence according to the economic sector column.

**Table 4. Shift Share of Agriculture, Forestry and Fisheries Sectors Based on Provinces in Indonesia (Billion Rupiah)**

No	Province	Nij	Mij	Cij	Dij
1	A	15.223	-4.553	431	11.101
2	B	50.921	-15.230	12.474	48.165
3	C	16.234	-4.855	-1.044	10.335
4	D	54.249	-16.225	556	38.580
5	E	14.061	-4.206	5.316	15.172
6	F	22.655	-6.776	-1.698	14.181
7	G	5.561	-1.663	-506	3.392
8	H	30.970	-9.263	-5.886	15.822



No	Province	Nij	Mij	Cij	Dij
9	I	3.629	-1.085	4.961	7.505
10	J	2.682	-802	-650	1.229
11	K	759	-227	-409	124
12	L	53.020	-15.857	-21.594	15.569
13	M	59.259	-17.724	-17.894	23.642
14	N	4.316	-1.291	-2.093	932
15	O	79.454	-23.763	-23.530	32.161
16	P	9.961	-2.979	689	7.671
17	Q	9.577	-2.864	-1.192	5.521
18	R	8.891	-2.659	399	6.631
19	S	8.310	-2.485	-1.265	4.560
20	T	12.787	-3.824	1.572	10.534
21	U	8.293	-2.480	1.438	7.251
22	V	8.154	-2.439	-810	4.905
23	W	12.598	-3.768	3.367	12.197
24	X	1.877	-534	643	1.986
25	Y	7.309	-2.186	-64	5.058
26	Z	11.619	-3.475	2.325	10.469
27	AA	23.567	-7.048	10.542	27.060
28	AB	8.178	-2.446	2.114	7.846
29	AC	3.558	-1.064	2.184	4.678
30	AD	4.456	-1.333	2.082	5.205
31	AE	2.872	-859	417	2.431
32	AF	2.343	-701	-55	1.587
33	AG	2.910	-870	-670	1.370
34	AH	6.952	-2.079	64	4.937

Source: Processed from secondary data (2020)

For example, in one province from the data in Table 5, it was the province with code A (Aceh province). The description was as follows: 1) a (agriculture, forestry and fisheries), first place; 2) b (mining and quarrying), on the seventh; 3) c (manufacturing), the fourteenth; 4) d (electricity and gas procurement), sixth; 5) e (water supply, waste management, waste and recycling), in eighth place; 6) f (construction), on the twelfth; 7) g (wholesale and retail trade; auto and motorcycle repair), sixteenth; 8) h (transportation and warehousing), fifteenth; 9) i (provision of accommodation and food and drink), tenth; 10) j (information and communication), on the eleventh; 11) k (financial services and insurance), ninth; 12) l (real estate), seventeenth; 13) m (company services), on the thirteenth; 14) n (government administration, defense and social security compulsory), fourth; 15) o (education services), fifth place; 16) p (health services and social activities), third; and 17) q (other services), second place.

**Table 5. The Sequence of Economic Sector Based on Dij Value in each Province in Indonesia\***

Province	Economic Sector Based on Dij Score																
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q
A	1	7	14	6	8	12	16	15	10	11	9	17	13	4	5	3	2
B	1	7	6	3	8	12	10	14	9	11	15	2	16	13	17	4	5
C	7	1	8	6	10	3	15	14	2	11	17	12	16	9	13	4	5
D	3	1	7	6	10	14	12	8	11	17	9	15	16	4	13	5	2
E	1	2	7	6	3	10	8	14	15	11	16	9	12	17	13	5	4
F	2	3	6	7	1	10	12	15	8	11	14	9	16	17	4	13	5
G	7	1	14	8	15	3	10	6	12	11	13	9	16	2	17	4	5
H	3	1	7	6	10	8	2	15	12	14	11	9	16	17	4	13	5
I	1	7	3	6	14	8	12	15	9	2	11	10	16	17	13	4	5
J	3	6	7	2	10	9	11	14	8	1	15	12	4	16	17	5	13
K	10	7	11	13	6	3	12	17	9	8	15	14	16	4	5	1	2
L	3	7	6	10	8	15	9	17	11	1	12	16	14	13	5	4	2
M	3	7	6	10	1	15	8	9	11	2	12	17	14	16	13	4	5
N	10	6	9	3	15	7	12	14	8	11	16	17	1	13	2	4	5
O	3	7	6	10	9	1	2	8	11	15	12	14	17	16	13	5	4
P	3	7	6	12	10	8	1	11	15	9	17	14	13	16	4	2	5
Q	9	6	7	10	1	8	15	3	14	11	12	16	17	13	2	4	5
R	1	7	6	8	15	11	12	3	10	14	17	16	9	13	4	5	2
S	1	14	7	6	10	15	8	11	16	17	12	3	2	9	13	4	5
T	1	7	3	6	10	2	8	11	14	15	12	9	16	17	13	4	5
U	1	2	3	7	6	8	14	15	11	12	9	16	10	17	4	5	13
V	2	7	3	1	6	8	15	14	10	11	9	12	16	17	13	5	4
W	2	1	6	7	8	15	10	3	11	9	14	16	12	17	13	4	5
X	6	1	2	7	8	3	14	10	15	9	16	11	17	12	4	5	13
Y	6	7	1	8	3	10	2	14	16	12	11	15	9	17	4	13	5
Z	2	3	1	6	7	14	10	8	15	11	16	12	17	9	13	5	4
AA	7	1	3	6	10	15	11	8	12	14	2	16	9	17	13	4	5
AB	2	1	6	7	3	15	8	14	11	10	17	12	16	9	13	5	4
AC	1	7	6	8	15	11	14	16	3	10	9	12	17	2	4	13	5
AD	1	3	14	7	6	15	10	2	11	16	17	12	8	9	5	4	13
AE	14	1	7	6	15	8	3	11	10	16	9	2	17	13	5	12	4
AF	7	14	1	3	6	8	2	10	11	15	16	17	9	13	4	12	5
AG	3	6	14	7	1	8	15	10	11	12	2	16	9	17	13	5	4
AH	6	14	7	1	8	10	12	15	16	11	3	13	17	9	4	5	2

Source: Processed from secondary data (2020)

Information: \* = sorted from highest Dij value to the lowest. Number 1 showed that sector was on the first place (on top), meanwhile number 17 showed that on the last place (bottom).

The agriculture, forestry, fisheries sectors in 10 provinces (Aceh, North Sumatra, Jambi, Bangka Belitung Islands, West Nusa Tenggara, East Nusa Tenggara, West Kalimantan, Central Kalimantan, Gorontalo, and West Sulawesi) had the highest net shifting values (first). Meanwhile, there were 24 provinces in the second rank, three and so on, indicating that most regions in Indonesia had experienced a shift in the main sector from agriculture to non-agriculture.

Accumulatively, developments in each province illustrated the situation at the national level. The agricultural sector, both for growth and contribution, had decrease from time to time, while other sectors, especially the manufacturing industry, wholesale trade and retail; auto and motorcycle repair, construction, had an accelerating growth rate followed by a larger contribution. Along with the development of information technology in the era of the industrial revolution 4.0, the information and communication sector was also increase strategically. The position of this sector was one level below the agriculture, forestry and fisheries sectors.

According to Mondal (2009), a shifting in the economic growth contributors had also occurred in Malaysia. Out of a total of 11 sectors, 5 sectors (agriculture, forestry and fisheries, mining and quarrying, manufacturing, construction, trade, retail, hotels and restaurants) had lower economic growth than the national level.

**Table 6. Dij Value Based on Sectors in Indonesia (trillion rupiah)**

Sectors	Dij
A. Agriculture, Forestry and Fisheries	370
B. Mining and Quarrying	113
C. Manufacture	930
D. Electricity and Gas Procurement	6,42
E. Water Supply, Waste Management, Waste and Recycling	3,1
F. Construction	485
G. Wholesale and Retail Trade; Auto and Motorcycle Repair	663
H. Transportation and Warehousing	211
I. Provision of Accommodation and Food and Drink	172
J. Information and Communication	360
K. Financial Services and Insurance	190
L. Real Estate	144
M,N. Company Services	105
O. Government Administration, Defense and Social Security Compulsory	118
P. Education Services	167
Q. Health Services and Social Activities	63,5
R,S,T,U. Other Services	96,8

Source: Secondary Data Analysis (2020)

## CONCLUSIONS

In general, the agriculture, forestry and fisheries sectors at the provincial and national levels had economic growth and their contribution to GRDP/GDP that decreased over time. In Java, this sector was classified as a basic not-prospective. However, the majority of areas in Sumatra Island, Sulawesi Island and Kalimantan Island had agriculture, forestry and fisheries sectors which were categorized as basic prospective. Sectoral transformation that occurred at the provincial level had an impact on the occurrence of a shifting in the economic structure at the national level. Based on the research that have been carried out, currently the agricultural, forestry and fisheries sectors were in the fourth rank after the manufacturing, wholesale and retail trade sectors; auto and motorcycle repair, and construction.

## RECOMMENDATION

Until now, the role of the agriculture, forestry and fisheries sectors as a provider of food, industrial raw materials and feed ingredients cannot be replaced by other sectors. Therefore, the occurrence of sectoral transformation must be accompanied by an increase in land productivity and an increase in the capacity of human resources in a sustainable manner. This aimed to maintain food security, prepare human resources to be more skilled in order to adapt to shifting economic structures, and at the same time continued to create greater additional value for agricultural, forestry and fishery commodities. Furthermore, the weakness of this research was that it has not yet extracted information on the factors that led to the transformation of the agriculture, forestry and fisheries sectors in each province. In addition, for the next research, it was also suggested to examine how the impact of sectoral transformation on the performance of the agriculture, forestry and fisheries sectors in the relation to labor absorption and income distribution.

## REFERENCES

- Abidin, Z. (2015). Aplikasi Analisis Shift Share pada Transformasi Sektor Pertanian dalam Perekonomian Wilayah di Sulawesi Tenggara. *Informatika Pertanian*, 24(2), 165–178.
- Ali, H., & Ahmad, S. (2009). Why Poor Regions Remain Poor? Evidence From Malaysia. *International Review of Business Research Papers*, 5(1), 340–351.
- Antara, M. (2007). Kebutuhan Investasi Sektor Basis dan Non Basis dalam Perekonomian Regional Bali. *SOCA Jurnal Sosial-Ekonomi Pertanian Dan Agribisnis*, 7(2).
- Darma Putra, E., & Yuli Pratiwi, M. C. (2019). Identification of Leading Sector and Cluster Analysis of Regencies in Kalimantan. *Economics Development Analysis Journal*, 8(2), 224–243. <https://doi.org/10.15294/edaj.v8i2.27237>
- Daulay, A. R., KP, E. I., Barus, B., & N, B. P. (2016). Rice Land Conversion into Plantation Crop and Challenges on Sustainable Land Use System in The East Tanjung Jabung Regency. *Procedia-Social and Behavioral Sciences*, 227, 174–180. <https://doi.org/10.1016/j.sbspro.2016.06.059>
- Gollin, D. (2010). Chapter 73 - Agricultural Productivity and Economic Growth. In *Handbooks in Economics* (1st ed., Vol. 4, Issue 09). Elsevier B.V. [https://doi.org/10.1016/S1574-0072\(09\)04073-0](https://doi.org/10.1016/S1574-0072(09)04073-0)
- Habibullah, M. S., & Radam, A. (2009). Industry Concentration in Rich and Poor States in Malaysia: Location Quotient and Shift Share Analyses. *The ICFAI University Journal of Industrial Economics*, VII(1), 56–65.
- Hajeri, Yurisinthae, E., & Dolorosa, E. (2015). Analisis Penentuan Sektor Unggulan Perekonomian di Kabupaten Kubu Raya. *Jurnal Ekonomi Bisnis Dan Kewirausahaan*, 4(2), 253–269. <https://doi.org/10.26418/jebik.v4i2.12485>
- Kesuma, N. L. A., & Utama, I. M. S. (2015). Analisis Sektor Unggulan dan Pergeseran Pangsa Sektor-sektor Ekonomi Kabupaten Klungkung. *Jurnal Ekonomi Kuantitatif Terapan*, 8(1), 100–107.
- Khairiyakh, R., Irham, I., & Mulyo, J. H. (2015). Contribution of Agricultural Sector and Sub Sectors on Indonesian Economy. *Ilmu Pertanian (Agricultural Science)*, 18(3), 150–159. <https://doi.org/10.22146/ipas.10616>
- Mandatari, J., Mukti, A., & Taufik, E. N. (2020). Analisis Potensi dan Kontribusi

- Subsektor Pertanian terhadap Pertumbuhan Ekonomi Daerah Provinsi Kalimantan Tengah. *J-SEA (Journal Socio Economics Agricultural)*, 15(1), 28–42.
- Mondal, W. I. (2009). An Analysis Of The Industrial Development Potential Of Malaysia : *Journal of Business & Economics Research*, 7(5), 41–46.
- Roosmawarni, A., & Soekarnoto. (2015). Di Provinsi Jawa Timur Tahun 2000 - 2010. *Jurnal Ekonomi Dan Bisnis*, XXV(1), 13–25.
- Suharyanto, Mahaputra, K., Arya, N. N., & Rinaldi, J. (2016). Faktor Penentu Alih Fungsi Lahan Sawah di Tingkat Rumah Tangga Petani dan Wilayah di Provinsi Bali. *Jurnal Pengkajian Dan Pengembangan Teknologi Pertanian*, 19(1), 9–22.
- Widianingsih, W., Suryantini, A., & Irham. (2015). Kontribusi Sektor Pertanian pada Pertumbuhan Ekonomi di Provinsi Jawa Barat. *Agro Ekonomi*, 26(2), 206–218. <https://jurnal.ugm.ac.id/jae/article/viewFile/17272/11263>