



Water Supply, Waste Management, Waste and Recycling Sector in Indonesia: A Study of Location Quotient, Classic and Spatial Shift Share and Export-Import

Agustono¹, Refa'ul Khairaykh², Indah Nurhidayati³

^{1,2,3} Agribusiness Study Program, Faculty of Agriculture, Universitas Sebelas Maret

ABSTRACT: The Water Supply, Waste Management, Waste and Recycling sector is one of the constituent sectors of the Indonesian economy. Water is an important component of human life, especially clean water. The provision of clean water is an activity that should be prioritized, in line with the 6th SDGs goal of clean water and proper sanitation. Waste and waste as by-products of economic activities, then management into useful goods is very important in supporting sustainable development, in accordance with what was launched by the United Nations through the concept of SDGs in goals 8, 11, 12, 13, 14 and 15. The data used is sourced from BPS from 2017-2022. Data analysis using LQ, Δ LQ, Classic and Spatial Shift Share and Export-Import. The results showed that (1) The PAPASLIDU sector in West Java is a superior sector in the present and future. (2) Sector growth in DKI is best compared to West Java, Central Java and East Java. The competitiveness of Central Java and East Java is still low (3) DKI and Central Java still remain importers, West Java changed from importers to exporters and East Java remained as an exporter. Suggestions (1) Policies in West Java in the PAPASLIDU sector need to be maintained, and the DKI, Central Java and East Java regions need improvement, (2) Improvements to reduce imports and increase competitiveness by striving to increase the provision of clean water for the community. Reducing waste generation and waste by managing it into useful and economically valuable goods, namely expanding activities that have been carried out and adding new activities for areas that do not yet exist.

KEYWORDS: Classic Shift share, Import Export, LQ, Spatial Shift Share.

INTRODUCTION

The constituent sectors of the Indonesian economy based on business fields are grouped into 17 sectors [1]. One of them is the Water Supply, Waste Management, Waste and Recycling (PAPASLIDU) sector. When examined closely, the PAPASLIDU sector is divided into 2 components, namely Water Supply (PA) and Waste Management, Waste and Recycling (PASILIDU).

Water is an essential component for mankind. As stated in Surat al Anbiya verse 30 which means: And do those who disbelieve not know that the heavens and the earth were once one, then We separated them. And from water We made everything that lives. So why do they not also believe?" [2]. This verse shows that for the survival of life living things need water. Thus, water supply is a very important activity. This is in line with the 6th SDGs goal, namely clean water and proper sanitation [3]. WHO mentions that one of the SDG targets is to ensure the availability and sustainable management of water and sanitation for all. WHO said one of the SDG targets is to ensure the availability and sustainable management of water and sanitation for all. This target is set so that everyone gets adequate and equitable services universally. This can be achieved through various efforts to improve water quality, water use efficiency, ensure sustainable withdrawal and supply of freshwater, implement integrated water resources management, protect and restore aquatic ecosystems, expand international cooperation and support, and strengthen local community participation by 2030. In reality, services are still not delivering the best results. If this trend continues, 1.6 billion of the world's population will not have access to drinking water. BAPPENAS RI, states that the national target in 2030 is to achieve 100 percent access improvement, 30 percent access security, and 50 percent access to piped water to the community. The target is successful, if the performance of drinking water management prioritizes improving the source, accessibility, availability and quality of water [4].

The provision of clean water in Indonesia is carried out by the government with PDAM, the community with PAMSIMAS, and private cooperation with the government. The Regional Drinking Water Company (PDAM) is one of the regionally owned business units, which is engaged in the distribution of clean water for the general public. PDAMs are located in every province, district and city throughout Indonesia. PDAM is a regional company as a means of providing clean water that is supervised and

monitored by the regional executive and legislature. The population of Indonesia that can access clean water reaches 20 percent of the total population of Indonesia. Even then, it is dominated by access by urban residents [5]. PAMSIMAS is an activity that aims to increase community access to decent and sustainable drinking water services with a community-based approach in order to achieve the drinking water access target by 2024 [6]. Private partnerships with government have been widely pursued to support infrastructure delivery. Many countries have implemented Private partnerships with government for a variety of reasons, ranging from limited government budgets to the idea that the private sector is more professional in infrastructure management. Drinking water, as a basic infrastructure that directly supports development, benefits from private participation more than any other sector [7].

Garbage and waste are by-products of human activities in economic development. The excessive presence of garbage and waste makes the environment uncomfortable for human life. It is said to be excessive if the amount of garbage and waste exceeds the assimilation capacity of the environment. For this reason, human intervention is needed to reduce it. In line with that, intervention in the form of waste and waste management is very important in sustainable development, as launched by the United Nations with SDGs in goals 8, 11, 12, 13, 14 and 15 [1]. Waste and waste management can be done by reuse or recycling. This is a good way to reduce community inconvenience and even support the economic growth of a region or country. The impact is to encourage business opportunities and employment for the community. This shows that garbage and waste are no longer a burden or cost to the community. Waste is also a source of income for the community and contributes to regional and national economic growth. To realize the SDGs with green economics in Indonesia, increasing the role of the PAPANSLIDU sector in economic development is very important. Two benefits will be obtained, namely (1) improving the welfare of the community through increasing GRDP and GDP, and (2) reducing waste generated through reuse and recycling activities.

BPS does not separate PA and PASLIDU data, so this study uses PAPANSLIDU data. Economically, the GDP value of the PAPANSLIDU sector was IDR 9 919.20 billion in 2021 [8] and IDR 9 449.30 in 2020 [9]. This shows an increase of IDR 469.9 billion or an increase of 0.0044%. The contribution in 2021 was 0.089% or in 2020 the contribution was 0.088%. This data shows an increase in contribution, although it is still low.

Cluster analysis using LQ and Shift share will provide full information to determine the strengths and weaknesses of the regional economy [10]. Therefore, LQ and Shift share are used as analytical tools in this study. The novelty in the research is to combine resources and environment with regional analysis approach by using classical and spatial shift share and import-export estimation as a development of LQ analysis. The objectives of this study are:

(1) to determine the provinces in Java Island that excel in the PAPANSLIDU sector, (2) to determine the role of classical and spatial growth components of the PAPANSLIDU sector in provinces in Java Island, (3) to determine the amount of export-import between provinces in Java Island from the PAPANSLIDU sector.

RESEARCH METHOD

The data in this study uses secondary data sourced from BPS DKI Jakarta, BPS West Java, BPS Central Java, BPS East Java, and BPS Indonesia. The position of the four provinces is presented in Figure 1. Furthermore, the data analyzed includes data on GRDP and GDP of the PAPANSLIDU sector from 2017-2022 using ADHK 2010.



Figure 1. The map of Java

Source: <https://id.search.yahoo.com/search?fr=mcafee&type=E210ID826G0&p=peta+pulau+Jawa>



The stages of data analysis are as follows:

1. Location Quotien (LQ)

Calculation of the LQ value with reference to the formulation used by [11][12][13][14].

$$LQ_{ir} = \left[\frac{PDRB_{ir}}{PDRB_r} \right] / \left[\frac{PDB_{in}}{PDB_n} \right] \dots\dots\dots 1$$

Changes in LQ will provide information on sector growth, which is increasing or decreasing [12]. Furthermore, Purdue CRD, IBRC and SDG 2007 in [12] categorize into 4 namely: (1) Stars, if $LQ > 1$ and ΔLQ is positive. This means that the sector is more concentrated in the analysis area compared to the reference area and in the future will become more concentrated in the analysis area. (2) Emerging, if $LQ < 1$ and ΔLQ is positive. This means that the sector is less concentrated in the analysis area compared to the reference area and in the future becomes more concentrated in the analysis area. (3) Mature, if $LQ > 1$ and ΔLQ is negative. This means that the sector is more highly concentrated in the analysis area compared to the reference area and in the future becomes less concentrated in the analysis area. (4) Transforming, if $LQ < 1$ and ΔLQ is negative, it means that the sector is concentrated lower in the analysis area than the reference and in the future the sector is concentrated lower in the analysis area than the reference.

2. Shift share

Shift-method allowed us to identify the determinants of regional economic dynamics for all available spaces [15]. There are three growth components in the shift share that will be analyzed to determine the performance of the reference and future PAPASLIDU sectors to be less concentrated in the analysis area. (4) Transforming, if $LQ < 1$ and LQ Change Value is negative. This means that the lower concentrated sectors in the analysis area compared to the reference area are NS (National share), IM (Industrial mix) and RS (Regional share) [11][12][14]. Shift Share analysis can be mathematically written classically for region 1 with code 1. Furthermore, for other regions, the method is to replace 1 with another code. The formulation is:

$$NSir1 = \left[\frac{PDBn_{t+1}}{PDBnt} \right] PDRBir1t \dots\dots\dots 2$$

$$IMir1 = \left[\frac{PDB_{in_{t+1}}}{PDB_{int}} \right] PDRBir1t \dots\dots\dots 3$$

$$RSir1 = \left[\frac{PDRBr1_{t+1}}{PDRBr1t} \right] PDRBr1t \dots\dots\dots 4$$

$$TCir1 = NSir1 + IMir1 + RSir1 \dots\dots\dots 5$$

The spatial shift share formulation becomes:

$$NSir1 = \left[\frac{PDBn_{t+1}}{PDBnt} \right] PDRBir1t \dots\dots\dots 6$$

$$NNMir1 = \left[\frac{PDRB_{ir1_{t+1}} - \frac{PDBnt+1}{PDBnt}}{PDRBir1t} \right] PDRBir1t \dots\dots\dots 7$$

$$RNSir1 = \left[\frac{PDRBir1_{t+1}}{PDRBr1t} - \frac{PDRBr(2,\dots,4)_{t+1}}{PDRBr(2,\dots,4)t} \right] PDRBir1t \dots\dots\dots 8$$

$$TCir1 = NSir1 + NNMir1 + RNSir1 \dots\dots\dots 9$$

Import-export calculation

The LQ approach until now has only been directed to determine the basis or not the basis of the sector, but it can also be used to estimate export-import [16]. The steps:

$$LQ = \left[\frac{Xir1}{PDRBr1} \right] \times \left[\frac{PDBn}{PDBin} \right] \dots\dots\dots 10$$

$$LQ = \left[\frac{Xir1 \times PDBn}{PDRBr1 \times PDBin} \right] \dots\dots\dots 11$$

$$Xir1 \times PDBn = LQ \times PDBin \times PDRBr1 \dots\dots\dots 12$$

$$Xir1 = [LQ \times PDBin \times PDRBr1] / PDBn \dots\dots\dots 13$$

$$[E - I]_{ir1} = [PDRBir1 - Xir1] \dots\dots\dots 14$$

Keterangan

PDBn t+1 : Indonesia's GDP in the final year

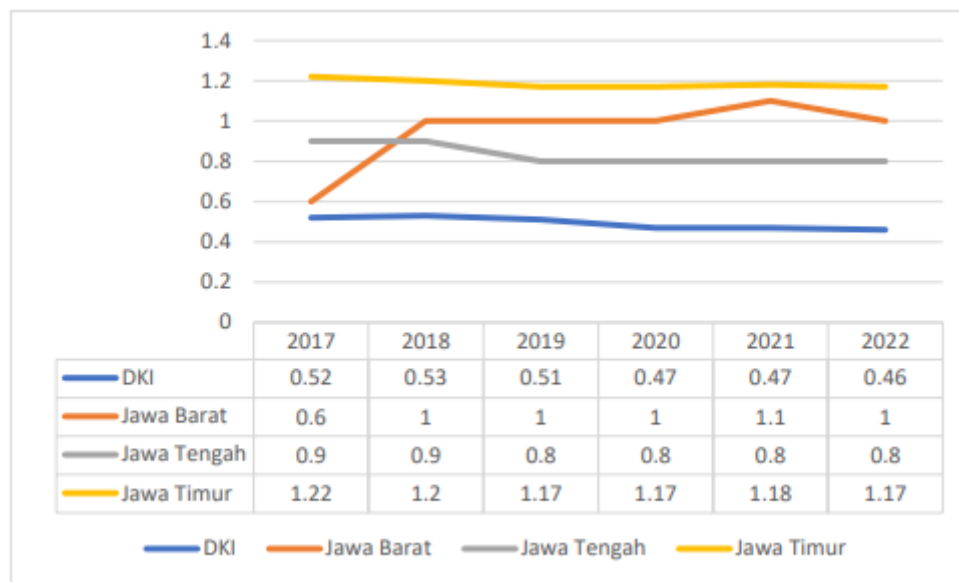


- PDB_n^t : Indonesia's GDP in the starting year
- $PDB_{PAPASLIDU}^{n^{t+1}}$: Year-end sector GDP
- $PDB_{PAPASLIDU}^{nt}$: Starting year sector GDP
- $PDRB_{PAPASLIDU}^{r^{t+1}}$: Year-end sector GRDP in region r
- $PDRB_{PAPASLIDU}^{r^t}$: GRDP of the initial year sector in region r
- r r(1...4) : (1)DKI,(2) Jawa Barat, (3)Jawa Tengah, (4)Jawa Timur
- NNIM : Neighbor-nation industry mix effect
- RNRS : Region neighbor regional-shift effect
- NNRS : Neighbor nation regional-shift effect
- X^* : Value-added production of the PAPASLIDU sector demanded by the public in province r in Java Island based on standardized LQs
- E_r : Value-added production of the PAPASLIDU sector exported to provinces outside Java Island r
- I_r : Value added production of PAPASLIDU sector imported by province r in Java Island

RESULTS AND DISCUSSION

1.LQ

LQ analysis is a relative comparison analysis between the analysis area and the reference area. The reference describes the average condition of the area covered in the reference area. The indicator is to use the standard 1. LQ analysis is an analysis of the relative comparison between the analysis area and the reference. The reference describes the average condition of the area covered in the reference area.



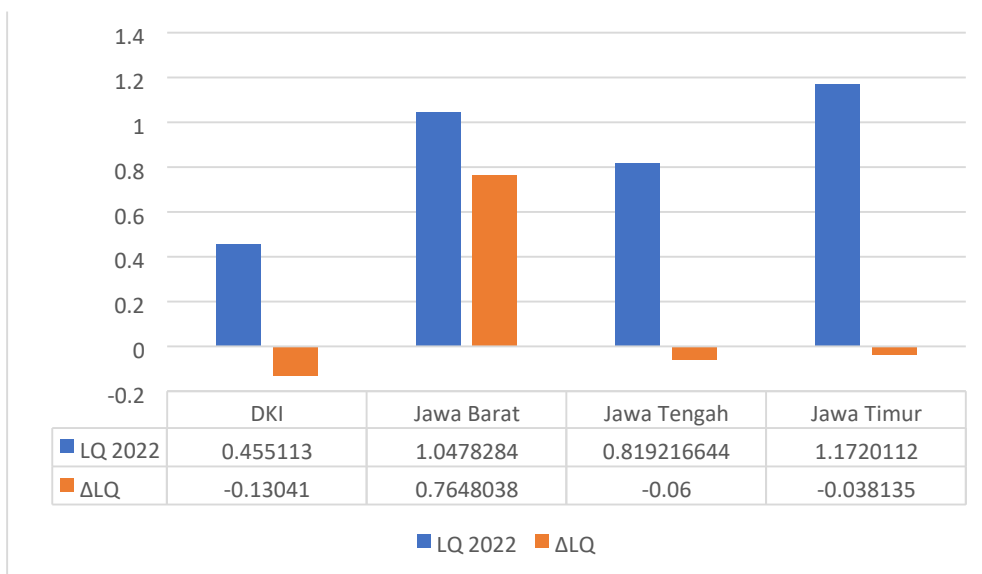
Graph 1. LQ and ALQ in DKI Jakarta, West Java, Central Java and East Java

Graph 1 shows that in DKI Jakarta the trend of LQ value has not changed with a magnitude below 1 and tends to decrease. This situation is similar to the dynamics in Central Java. The difference is that the magnitude of the LQ value is higher than that of DKI. This condition is the opposite of West Java, in 2017 $LQ < 1$ but in the following year $LQ > 1$. West Java initially imported from other regions, but later developments became an area capable of exporting to other regions. East Java remains consistent with $LQ > 1$. Although there is a downward trend.



2.LQ and Delta LQ

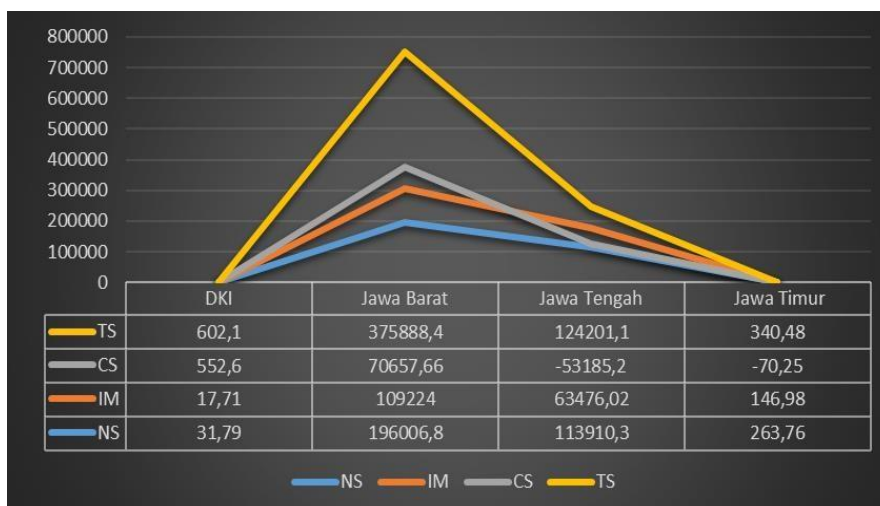
The combination of LQ and Δ LQ will produce a classification in the PAPASLIDU sector. The classification of DKI and Central Java is emerging, West Java is stars, and East Java is mature. West Java shows superior in both current and future positions. East Java is superior now but not superior in the future. While DKI and Central Java's current and future positions are not superior.



Graph 2. LQ and Δ LQ in DKI Jakarta, West Java, Central Java and East Java

3. Classical Shift Share

Classically, all TS values are positive, indicating that in all regions the PAPASLIDU sector contributes to economic growth. The largest is West Java, followed by DKI Central Java and East Java. Regionally there are two regions that have competitiveness, namely DKI and West Java. This is indicated by the positive CS value. Meanwhile, Central Java and East Java have low competitiveness. The review of IM is all positive. This shows that industrially the PAPASLIDU sector is doing well with growth above all sectors of the national economy. The national share also has positive growth, indicating that national economic policies are well underway in supporting the PAPASLIDU sector. Furthermore, the contribution of growth components including NS, IM, CS and TS is presented in the graph below.



Graph 3. Classic shift share



PAM water is used to fulfill daily needs such as bathing. Map of PAM Jaya's piped network service coverage, across five administrative cities in DKI Jakarta. North and West Jakarta are red zones. This means that these areas do not yet have piped access. Until 2020, the coverage of water source services in DKI Jakarta has reached 65 percent. The number of PAM Jaya customers as of June 2021 is around 907 thousand people. PAM targets to reach 100 percent service coverage by 2030. Piped water flowing to Jakarta is approximately 20,725 liters per second. Thousand Islands, where there is no surface water source, PAM Jaya in 2019 built a SWRO or Sea Water Reverse Osmosis Water Treatment Plant (IPA), where the raw water comes from the sea. There are nine of the 11 inhabited islands in the Thousand Islands served by PAM through SWRO IPA or 77 percent coverage. SWRO production costs are much more expensive than using surface water [17].

DKI Province waste management programs include (1) Waste bank is an activity of collecting household dry waste, such as plastic, paper, cans, and others by implementing a waste-to-money conversion system. Waste bank is a program of the Environmental Agency that aims to reduce the volume of waste from household activities, and recycled waste has economic value. (2) The DKI Jakarta Provincial Government initiated a movement to reduce and process waste through the Samtama (Sampah Tanggung Jawab Bersama) program. The waste movement that starts from the community is expected to change the mindset by implementing a minimal waste lifestyle and behavior that can process waste. This program aims to make the environment cleaner, and people's lifestyles can maintain cleanliness. (3) Electronic waste is managed with e-waste. After being collected at the LH Agency warehouse, e-waste is then transported by officers to a third party, a B3 e-waste processing company, for processing. The management of e-waste aims to reduce the risks posed by electronic waste. The success of this program requires community participation in sorting and managing waste according to its type. (<https://www.jakarta.go.id/index.php/pengolahan-sampah>)[18].

At TPST Bantar Gebang, waste is processed by (1) Landfill, this is an accumulation of waste in a hole in the ground. (2) Composting unit, this is a unit for processing organic waste into compost. At this time, more waste is processed from the Kramat Djati Main Market.

Every day TPST Bantar Gebang is able to produce 1,500-1,600 kg of compost. Thousands of tons of compost produced are marketed to agricultural stores. (3) The Waste Water Treatment Plant (WWTP) is a facility that can treat leachate water collected from landfills. This leachate is generated from the decomposition of organic waste mixed with rainwater. The aim is to avoid water and soil pollution caused by leachate. (4) Power House is a renewable energy producer by converting methane gas into electrical energy. (5) The PLTSa at TPST Bantar Gebang is called PLTSa Merah Putih. Plastic waste is utilized as fuel. Plastic waste that has been sorted and dried is burned to heat water. The steam from the water is used to drive a generator. Every day, 110.59 kWh of electricity is generated per ton of waste burned. (<https://kopijagung.com/pengelolaan-sampah-di-tpst-bantar-gebang/>)[19]. The DKI Jakarta Provincial Government prefers to develop waste-to-fuel processing, known as refuse derived fuel (RDF). Operational costs are cheap, then also faster development. The results can be sold to cement factories. The development of waste into RDF is much cheaper than processing waste into an intermediate treatment facility (ITF) which is planned to be built in Sunter, North Jakarta [20].

In West Java, regional policies and strategies in the management of household waste and similar household waste, here in after referred to as the Provincial Jakstrada, are the direction of policies and strategies in reducing and handling household waste and similar household waste in West Java Province that are integrated and sustainable [21]. The West Java Provincial Government to reduce environmental pollution by implementing digital application-based waste management. This waste management system works with the Octopus application that can be downloaded on devices. Plastic waste in residents' homes is picked up by scavengers or collectors and channeled to a recycling plant in West Bandung Regency [22]. The West Java Provincial Environmental Agency (DLH) will develop seven master waste banks that oversee around 1,616 waste bank units spread across West Java in 2021. The goal is to increase the utilization of waste with economic value for the community. As for the stages or patterns of handling household waste, (1) waste is taken from the waste bank unit, (2) taken to the main waste bank, and (3) put into the plastic industry and make money for the community. This circular economy is developed with the existence of waste banks. The West Java Provincial Government is promoting the waste bank program. The goal is to realize the plan to reduce waste in the community by 30 percent. Waste banks play an important role in waste management from the household level. In addition to encouraging recycling processes that have economic benefits, waste banks also educate the public about waste sorting [23]. The number of waste banks by the Ministry of Environment and Forestry reached 7,700 units. A total of 1,700 units or 22% are located in West Java. This number is higher than in 2021 [24]. Other efforts made as described by [25] plastic waste conversion projects are decided to be

built in five areas, namely Greater Bandung, Bogor, Bekasi-Karawang, Cirebon, and Tasikmalaya. The project is planned to be undertaken by Plastic Energy. Plastic Energy, as an investor, is developing the conversion of all plastic waste into fuel on an industrial scale.

The potential of the circular economy in Central Java is high. The basis is the amount of waste generated, which reaches around 6.3 million tons per year. Of that amount, about 17.8 percent is plastic waste. In Kudus, for example, organic waste is managed at home and not allowed to leave the yard. The community is educated with a composter. Waste that is allowed to be moved out of the house is inorganic waste, which is then separated and sold. An example is the use of applications in Banyumas with the Jeknyong application. This application facilitates the collection of waste that has been separated by the community, then taken to the processing site. Waste processing is pursued with high technology, such as in Semarang City and Solo City (Figure 2), waste is converted into electricity and in Cilacap, waste is converted into briquettes. [26]



Figure 2. Putri Cempo Solo solar power plant

Source: Antara Foto/Maulana Sury [27]

PLTSA Putri Cempo in Solo, Central Java, produces 8 MegaWatts (MW) of waste-based electrical energy once produced with the need for 545 tons of raw waste every day [27].

The East Java Provincial Government through the Nawa Bhakti Satya Program, especially the 9th Bhakti Jatim Harmoni, continues to strive to maintain social and natural harmony by preserving culture and the environment. One of the main objects is waste management. Good waste management will maintain the sustainability and cleanliness of rivers and coastal areas. The Governor of East Java on the commemoration of the 2020 National Waste Awareness Day (HPSN), urged the public to start paying more attention to waste management and not to throw garbage into the river. To improve waste management, the East Java Provincial Government invites the community to make 3R (Reduce, Reuse, Recycle) efforts. The utilization of Waste Banks and the development of waste management innovations through the Clean and Sustainable Village Program (Berseri) so as to turn waste into blessings. To date, 302 villages have won the Berseri Village award as a form of appreciation for their commitment to waste management and reduction efforts. The East Java Provincial Government strengthens the capacity of village-level communities in improving climate change adaptation and mitigation through the implementation of the Climate Village Program (PROKLIM)[28].

4. Spatial shift share

The results of the spatial shift share analysis (Table 1) show that the growth of the PAPASLIDU sector in DKI is higher than in the other three regions. This is indicated by the positive effect of neighbors. Positive indicates the ability of the PAPASLIDU sector in DKI is better than the other three regions. West Java, sector growth in DKI has a negative effect on sector growth in West Java. This shows that the sector performance in DKI is better than West Java. On the other hand, when compared to Central Java and East Java, West Java has better performance. For Central Java, growth in the other three regions has a negative effect. This means that Central Java has the lowest growth. Its performance is lower than the other three regions. East Java has lower growth than DKI and West Java, but better than Central Java. When examined from IM, the four regions have more growth than the growth of the national economic sector. This is indicated by the positive IM values in DKI, West Java, Central Java and East Java (Table 1).



Table 1 Spatial shift shares of the PAPASLIDU sector in DKI Jakarta, West Java, Central Java and East Java

Provinsi	DKI	West Java	Central Java	East Java	Description
DKI		196006.79	113910.3	263.76	NS
		3516887.8	2043856	4732.5	Effect of IM
		-3337006	-2033565	-4656	Effect of neighbor TS
		375888.4	124201.1	340.48	
West Java	31.79		113910.3	263.76	NS
	29.17		104539	242.06	Effect of IM
	541.2		-94248.24	-165.3	Effect of neighbor TS
	602.1		124201.1	340.48	
Central Java	31.79			263.76	NS
	2.872	17707.517		23.828	Effect of IM
	567.5	162174.1		52.895	Effect of neighbor
	602.1	375888.4			TS
East Java	31.79	196006.8	113910.3		NS
	9.246	57015.93	33135.07		Effect of IM
	561.1	122865.7	-22844.27		Effect of neighbor TS
	602.1	375888.4	124201.1		

5. Export-Import

Estimates of the size of exports or imports from the four regions to other regions are presented in Table 2. A positive sign implies exporting to other regions. A negative sign means importing from other regions. Calculations using standard LQ 1. The number 1 is used to indicate the mean or average value as the standard.

Table 2. Estimated Export-Import of PAPASLIDU Sector in DKI Jakarta, West Java, Central Java and East Java from 2017-2022.

Year	E-I DKI	E-I West Java	E-I Central Java	E-I East Java
2017	-161.54	-1414.38	-91747.50	260.54
2018	-665.36	-13246.40	-102001.00	251.37
2019	-746.51	-57281.90	-127944.00	229.81
2020	-836.17	14434.76	-147352.00	246.54
2021	-882.19	75031.85	-144789.00	272.45
2022	-930.77	66498.50	-166040.00	263.46

Table 2 shows that DKI and Central Java during the period 2017-2022 are still importing from other regions. West Java in 2017-2019 still imported from other regions but in 2020-2022 it was able to send to other regions. The policies implemented in West Java are able to change from importers to exporters. East Java during the 6-year period has always sent to other regions. This shows that the policy in East Java is able to maintain its territory as an exporter. Policies in Central Java and DKI Jakarta have not been able to change their regions from importers to exporters..

CONCLUSIONS AND SUGGESTIONS

(1) The PAPASLIDU sector in West Java is a superior sector in the present and future. (2) Sector growth in DKI is best compared to West Java, Central Java and East Java. The competitiveness of Central Java and East Java is still low (3) DKI and



Central Java still remain importers. West Java changed from importers to exporters and East Java remained as an exporter. Suggestions (1) Policies in West Java in the PAPASLIDU sector need to be maintained. and the DKI. Central Java and East Java regions need improvement. (2) Improvements to reduce imports and increase competitiveness by striving to increase the provision of clean water for the community and increase waste that is managed into useful and economically valuable goods. Suggestions (1) Policies in West Java in the PAPASLIDU sector need to be maintained. and the DKI. Central Java and East Java regions need improvement. (2) Improvements to reduce imports and increase competitiveness by seeking to increase the provision of clean water for the community by PAM or PDAM. PAMSIMAS. and private cooperation with the government. Reducing waste generation and waste by managing it into useful and economically valuable goods. namely enlarging activities that have been implemented and adding activities for areas that do not yet exist. such as organic waste being converted into biogas or briquettes as renewable energy.

REFERENCES

1. BPS 2022. {Seri 2010] PDB Menurut Lapangan Usaha Seri 2010 (Milyar Rupiah).
2. Ibnu Katsir. Tafsir al Qur'an. Sinarbaru Algensindo.
3. Abdul Majiid. F. Sustainable Development Goals (SDGs) dan upaya Implementasinya di Indonesia: Tantangan dan Harapan. Academia.edu/35567234/Sustainable_Development_Goals_SDGs_dan_Upaya_Implementasinya_di_Indonesia_Tantangan_da_n_Harapan?auto=download&email_work_card=download-paper. Di akses pada tanggal 9 Maret 2022.
4. Herdiana. I.. (2022). Krisis Air Bersih Menghantui Jawa Barat dan Dunia. <https://bandungbergerak.id/article/detail/2347/krisis-air-bersih-menghantui-jawa-baratdan-dunia>
5. Wikipedia. (2023). Perusahaan Daerah Air Minum. https://id.wikipedia.org/wiki/Perusahaan_Daerah_Air_Minum.KA
6. Pamsimas (2023). Penyediaan air minum dan sanitasi berbasis masyarakat. <https://pamsimas.pu.go.id/>
7. Tambunan, S.H.J (2023). Implementasi kerjasama pemerintah dan swasta dalam penyediaan pembangunan infrastruktur sektor air minum di Indonesia. Fakultas Teknik Sipil Universitas Pancasila. <https://www.researchgate.net/publication/373980643> /
8. BPS (2021) [Seri 2010] PDB Menurut Lapangan Usaha Seri 2010 (Milyar Rupiah). 2021.
9. BPS (2020) [Seri 2010] PDB Menurut Lapangan Usaha Seri 2010 (Milyar Rupiah). 2020
10. Primont. D. F.. dan Domazlicky. B. (2008). Industry Cluster Analysis for the Southeast Missouri Region. Center for Economic & Business Research. Cape Girardeau.
11. Dinc. M. (2002). Regional and Local Economics Tools. World Bank. World Bank Institute. Public Finance. Decentralization and Poverty Reduction Program. <http://info.worldbank.org/etools/docs/library/128789/Dinc%202001.pdf>
12. Sambidi. P.. (2008). Regional Industry Cluster Analysis for the Gulf Coast Economic Development District. Reviewed by Chuck Wample. Dimitry Messen and Jeff Taebel. Department of Community and Environmental Planning. Houston-Galvestone Area Council. Houston. Texas
13. Tarigan. R.. (2012). Ekonomi Regional Teori dan Aplikasi Edisi Revisi. Bumi Aksara. Jakarta.
14. Soo. W. M. Kwang. B.L.. Yong. J.L.. Hong. G.P.. (2020). Analysis of import changes through shift-share. location quotient and BCG techniques: Gwangyang Port in Asia. The Asian Journal of Shipping and Logistics. Volume 36. Issue 3. September 2020. Pages 145156.
15. Mohamed. A.B. (2017). The Shift-share analysis of Tunisian regions local and structural dynamics". International Journal of Current Research. 9. (10). 58944-58956.
16. Agustono dan Darsono (2020). Location question (LQ): Klasifikasi. signifikansi dan estimasi tidak langsung ekspor impor. Dalam Umi Barokah. Rhina Uchyani Fajarningsih. Agustono dan Dea Hagania Laia (ed). Kapita Selektta Ekonomi Pertanian. Laboratorium Ekonomi Pertanian UNS. Program Studi Agribisnis. Fakultas Pertanian. UNS. UNS press.
17. DKI Jakarta. 2022. Pengolahan Sampah. <https://www.jakarta.go.id/index.php/pengolahan-sampah>
18. Liputan 6 (2022). Jakarta Krisis Sumber Air Bersih. Tantangan Besar PAM Jaya. <https://www.liputan6.com/news/read/4673582/journal-jakarta-krisis-sumber-air-bersih-tantangan-besar-pam-jaya>
19. Blog Kopi Jagung (2021). Melihat Proses Pengelolaan Sampah di TPST Bantar Gebang. <https://kopijagung.com/pengelolaan-sampah-di-tpst-bantar-gebang/>



20. Muhtarom. I.. (2023). Mengapa DKI Pilih Kembangkan Pengolahan Sampah RDF Daripada Lanjutkan ITF Sunter? <https://metro.tempo.co/read/1753860/mengapa-dkipilih-kembangkan-pengolahan-sampah-rdf-daripada-lanjutkan-itf-sunter>.
21. Peraturan Gubernur Jawa Barat Nomor 91 tahun 2018. Kebijakan dan Startegi daerah Provinsi Jawa Barat dalam Pengelolaan Sampah Rumahtangga dan Sampah Sejenis Sampah Rumahtangga tahun 2018-2025. <https://peraturan.bpk.go.id/Home/Details/137157/pegub-prov-jawa-barat-no-91-tahun-2018>.
22. Kompas. (2021). Kurangi Pencemaran Lingkungan. Jawa Barat Kelola Sampah Berbasis Aplikasi. <https://www.kompas.id/baca/nusantara/2021/05/05/kurangi-pencemaran-lingkungan-jawa-barat-kelola-sampah-berbasis-aplikasi/>.
23. Rahman. B. (2021). 7 Bank Sampah Di Jawa Barat akan dikembangkan. <https://citarumharum.jabarprov.go.id/tahun-2021-7-bank-sampah-di-jawa-barat-akandikembangkan/>
24. SATGAS PPK DAS CITARUM (2023). Bank Sampah Jabar Terbanyak se-Indonesia. <https://citarumharum.jabarprov.go.id/bank-sampah-jabar-terbanyak-se-indonesia/>
25. Dinillah. M.. (2020). Jabar Bakal Punya 5 Tempat Pengolahan Sampah Plastik di 2023" .<https://news.detik.com/berita-jawa-barat/d-4887112/jabar-bakal-punya-5-tempatpengolahan-sampah-plastik-di-2023>.
26. Pemerintah Provinsi Jawa Tengah. (2023) Kurangi Plastik. Ganjar Akan Gelar Kongres Sampah di Jateng. <https://jatengprov.go.id/publik/kurangi-plastik-ganjar- akan-gelarkongres-sampah-di-jateng/>.
27. Detikfinance. (2023). Solo Kini Punya Pembangkit Listrik Tenaga Sampah. <https://finance.detik.com/foto-bisnis/d-7010427/solo-kini-punya-pembangkit-listriktenaga-sampah>.
28. Dinas Lingkungan Hidup Provinsi Jawa Timur (2023) Kualitas Lingkungan Hidup Di Jatim Semakin Baik Di 4 Tahun Kepemimpinan Khofifah-Emil. <https://dlh.jatimprov.go.id/public/berita/kualitas-lingkungan-hidup-di-jatim-semakinbaik-di-4-tahun-kepemimpinan-khofifah-emil>

Cite this Article: Agustono, Refa'ul Khairaykh, Indah Nurhidayati (2024). Water Supply, Waste Management, Waste and Recycling Sector in Indonesia: A Study of Location Quetion, Classic and Spatial Shift Share and Export-Import. International Journal of Current Science Research and Review, 7(6), 3636-3645