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Logistics Costs of Rice and Soybean:

Issues, Challenges, and the Impact of Regulations

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Editorial notes

The previous version contains spelling errors:

On Page 15:

- Rice and soybean logistics have a different cost breakdown than logistics generally in Indonesia. The contribution of logistics costs to the final price received by customers is expressed in the trade and transportation margin (*Margin Perdagangan dan Pengangkutan* or MPP). As seen in Table 1, the total MPP at a given stage of the supply chain **should be *(10) and not (14)*** is the difference between the purchase price when a good enters this stage of the supply chain (1) and the selling price when it leaves that stage of the supply chain **should be *(11) and not (15)***. Processing costs are represented by rows **should be *2–4 and not 2-5*,** logistics costs by rows **should be *5-8 and not 6-12***, and profit by line **should be *9 and not 13***.

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GLOSSARY

GDP:
Gross Domestic Product

HPP:
*Harga Pembelian Pemerin*tah/Government Purchasing Price

MOA:
Ministry of Agriculture

MOF:
Ministry of Finance

MOTr:
Ministry of Transportation

MPP
Margin Perdagangan dan Pengangkutan/Trade and Transportation Margin

NFA:
National Food Agency

PIB:
Pemberitahuan Import Barang/Import Declaration

PSO:
Public Service Obligation

SME:
Small and Medium Enterprises

SOE:
State-Owned Enterprises

VAT:
Value-Added Tax

EXECUTIVE SUMMARY

This paper focuses on the challenges in the logistics of rice and soybeans in Indonesia. Rice distribution is complicated because rice production is concentrated in Java, while its consumption is high all over Indonesia. Soybeans are predominantly import and must contend with both import logistics and domestic logistics challenges.

At the national level, logistics roughly contributes 21–23% of Indonesia's gross domestic product (GDP), much higher than in other developing countries. Transportation and inventory costs dominate logistics costs in Indonesia, while administrative costs such as fees and charges at the port contribute less than 6%. High logistics costs are passed on to consumers, raising the prices of goods, including staple foods.

Compared to the national average for all goods, the transportation and logistics of rice and soybeans experience a higher burden of administrative costs, but transportation and industry costs remain important. Many of these cost components are affected by government policies and regulations, introducing monetary and time costs that affect the logistics of these goods as they move through their supply chains.

Programs to reduce logistics costs have mostly focused on eliminating price disparities affecting essential goods between the western and eastern parts of Indonesia. This task is difficult to achieve due to Indonesia's archipelagic geography and unequal economic development. The effort to achieve more equal prices through the Sea Highway and public service obligation (PSO) programs for state-owned enterprises has experienced only mixed success and accommodates the high costs rather than addressing their underlying causes.

We identify 24 regulations from nine logistics processes and their associated logistics costs. Rice and soybean logistics expenses are affected by regulation that affects logistics costs related to warehousing, shipping, and trucking. Land transportation (trucking) is the largest contributor to transportation costs, which can be attributed to monetary and time costs created by regulations regarding a value-added tax on some services, mandatory appointment of local freight forwarding services, and the weighing of vehicles at a weigh station. Sea transportation and administrative costs are also important.

To reduce the impact of regulations on the logistics costs of rice and soybeans, we recommend five changes:

- In the port, the government through the Ministry of Transportation (MOTr) can set a port service productivity threshold and provide incentives for ports that can stay within the threshold in order to offer competitive rates and quality of port services.
- During the import process and customs clearance, system integration with customs authorities in soybean-exporting countries should be pursued to cut the time in the issuance of certificates of origin.

- A special quarantine method using quarantine ships or floating labs should be designated by the Ministry of Agriculture (MOA) to allow the process to start before ships enter the port
- The mandatory use of local freight forwarding services should be relaxed to allow companies outside the local area to carry out freight forwarding when services are not available in the area.
- Finally, food reserve policy should incorporate incentives, such as interest subsidies, for buying or releasing food stocks that should be provided for both public (Bulog and food state owned enterprises (SOEs)) and private actors.

INTRODUCTION

The Importance of Rice and Soybean Supply Chains

Rice and soybeans are staple food commodities in Indonesia with unique supply chain characteristics and logistics challenges. The distribution process for rice mostly consists of domestic trade, which uses trucks for intra-island delivery (within the island) and bulk carriers or dry container vessels for inter-island shipment (Interview 2). The soybean logistics process covers both international and domestic trade, using trucks for intra-island transport and dry container vessels for inter-island transport.

Rice Distribution

The main challenge facing rice distribution comes from the concentration of rice production in Java paired with consumption dispersed across Indonesia. Eighteen of 34 provinces in Indonesia experienced a rice deficit in 2021, meaning they needed to bring in rice beyond what they produced to meet the demand for rice consumption. This condition causes inter-regional trade in rice which involves logistics processes through land, sea, or air transportation, primarily land and sea.

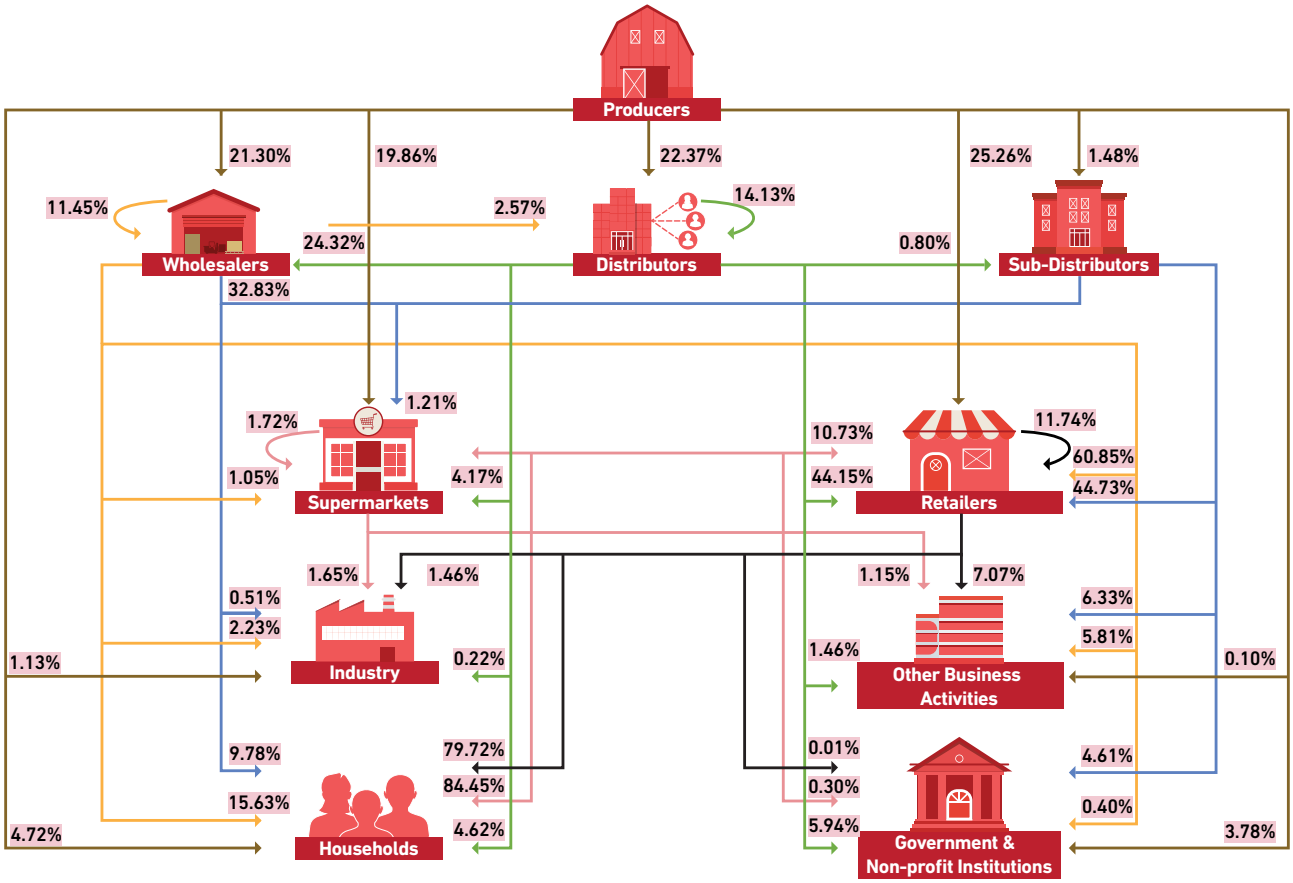
East Java, Central Java, and West Java are three provincial rice production centers with a total production of 16.45 million tons in 2021, 52.45% of national rice production (Statistics Indonesia, 2022). These provinces are also the largest rice consumers, representing 9.78 million tons or 44.35% of national rice consumption.

"The main challenge facing rice distribution comes from the concentration of rice production in Java paired with consumption dispersed across Indonesia."

Another challenge is a complex supply chain (Octania, 2021). The Rice Distribution Pattern Survey (Statistics Indonesia, 2022) found that the distribution of milled rice in Indonesia can involve as many as seven economic agents: producers, distributors, sub-distributors, wholesalers, supermarkets, retail traders, and final consumers[1].

[1] In the survey, producers are defined as individuals or legal entities that produce milled rice and sell it to other parties. These can be farmers or traders. Distributors are businesses acting on producers' behalf or under the appointment of a producer to trade goods and control registered warehouses. A distributor that trades goods under the appointment of another distributor is defined as a sub-distributor. A wholesaler sells goods in large quantities and purchases less than 50% of its inventory from producers, distributors, and inter-island trades. Retailers and supermarkets both sell the majority (>50%) of their inventory to households. The difference between a (traditional) retailer and a supermarket in the survey lies in the payment system and building area. A supermarket provides self-service, facilitates transactions with barcodes and cashiers, and has a minimum building area of 400 m^2. Final consumers consist of households, government, industry, and non-profit institutions.

Figure 1.
Rice Distribution Chain



Legend:

- Producer's distribution channel
- Wholesaler's distribution channel
- Distributor's distribution channel
- Retailer's distribution channel
- Sub-Distributor's distribution channel
- Supermarket's distribution channel

Sources: Statistics Indonesia, Rice Distribution Pattern Survey (2022)

Figure 1, which provides an overview of rice distribution in Indonesia, illustrates that the largest destination for rice sold by producers is retailers, who receive 25.26% of the total volume of rice from producers. Retailers are also the main destination for rice sold by distributors (44.15%), sub-distributors (44.73%), and wholesalers (60.85%). Meanwhile, most of the rice from supermarkets (84.45%) and from retailers (79.72%) was distributed to household consumers.

Soybean Distribution

Unlike rice, the supply chain for soybeans involves considerable foreign imports. Indonesia produced 424 thousand tonnes of soybeans in 2019 from 285 thousand hectares of harvested area, while the Ministry of Agriculture (MOA) reports that domestic soybean demand was 3.06 million tonnes in 2019. Domestic supply therefore met only about 13.86% of domestic demand (MOA, 2021A).

The main production centers for domestic soybeans are in the provinces of East Java, Central Java, and West Java with a total production of 243,930 tonnes or 57.51% of national soybean production (MOA, 2021A). The 2.67 million tons of soybeans imported into Indonesia in 2019 overwhelmingly came from the United States (2.51 million tonnes), followed by Canada (128 thousand tonnes) and Brazil (18 thousand tonnes) (MOA, 2021A). As with rice, both local and imported soybeans are distributed to all regions of Indonesia.

> "Unlike rice, the supply chain for soybeans involves considerable foreign imports."

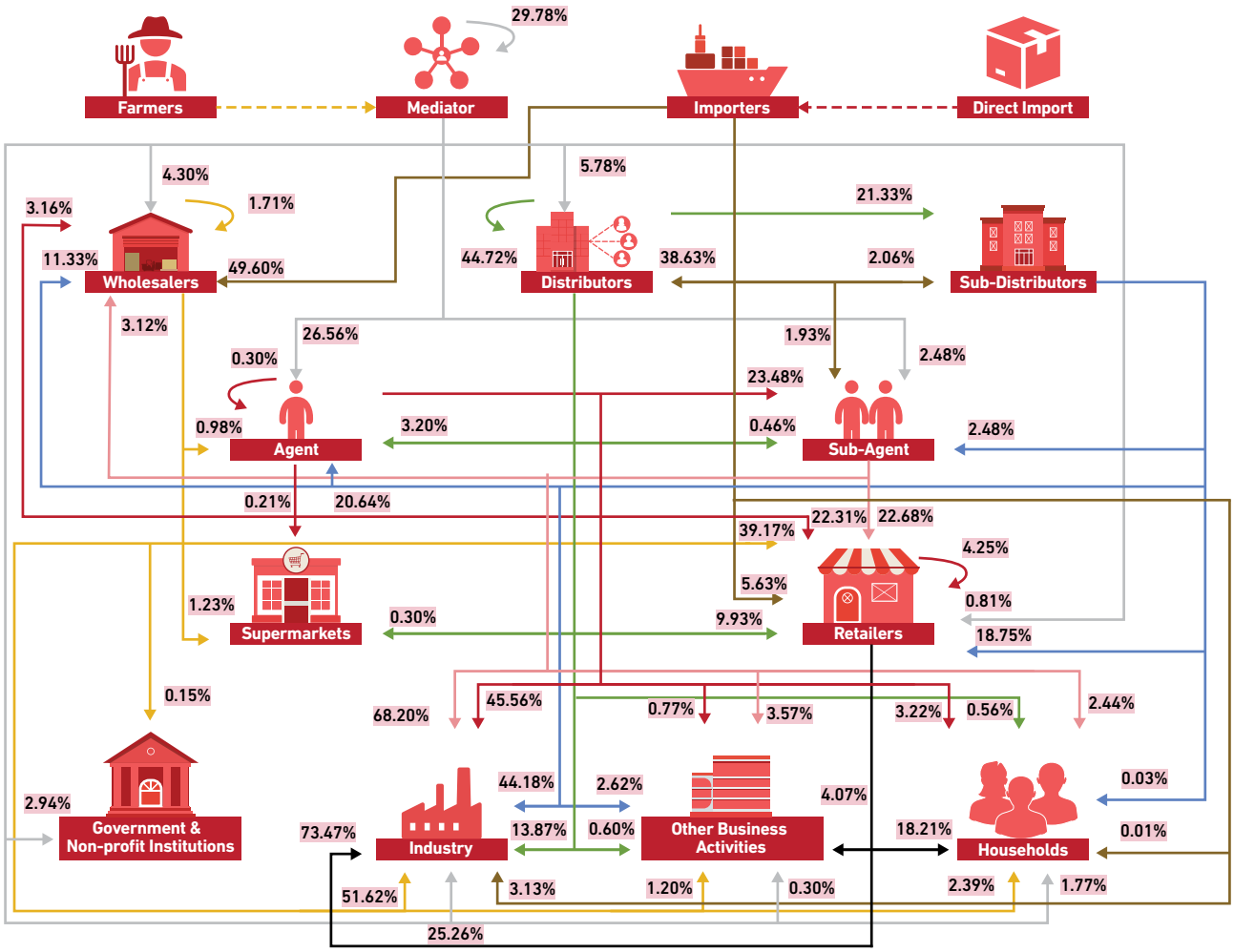
An overview of soybean distribution in Indonesia is provided in Figure 2. Distribution of domestic soybeans[2] starts with farmers who pass their crop on to a mediator. Mediators distribute mostly to other mediators (29.78%), agents (26.56%), and industry (25.28%) (Statistics Indonesia, 2013). The remainder goes to distributors, sub-agents, wholesalers, retailers, other business activities, government and non-profit institutions, and households.

Imported soybeans are distributed by importers mostly to wholesalers (49.60%), distributors (38.63%), retailers (5.63%), and industry (3.13%). The remainder is passed on to sub-distributors, sub-agents, and households (Statistics Indonesia, 2013).

Domestic soybeans go through at least five actors before they are received by industrial users, compared to as few as three actors for imported soybeans (Statistics Indonesia, 2013). The fact that domestic soybeans go through smaller traders such as mediators and agents is an important factor in its longer and possibly more expensive distribution chain.

[1] Based on Statistics Indonesia's Soybean Distribution Pattern Survey, farmers are defined as individuals or businesses who produce soybeans from their own land and sell them to other parties. Mediators (*pedagang pengumpul*) are entities who purchase directly and actively coordinate with farmers to sell their crops. Importers are entities that import goods into Indonesian customs areas. An agent works as an intermediary for and on behalf of another party, from whom they receive commissions. An agent can be further represented by sub-agents. The industry in the case of soybeans may include micro, small, and medium enterprises that process soybeans into tofu and tempeh. Other actors in the chain are similarly defined as in the case of rice.

Figure 2.
Soybean Import and Domestic Distribution Pattern



Legend:

- Importer's distribution channel
- Wholesaler's distribution channel
- Mediator's distribution channel
- Agent's distribution channel
- Distributor's distribution channel
- Sub-Agent's distribution channel
- Sub-Distributor's distribution channel
- Retailer's distribution channel

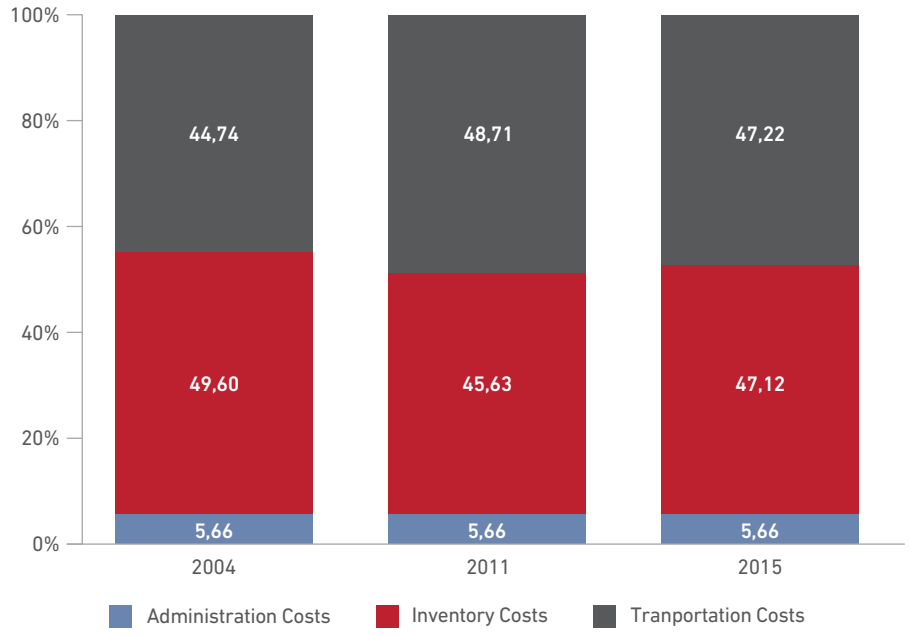
Sources: Statistics Indonesia, Soybean Distribution Pattern Survey (2013), Processed by Authors

Most soybeans are used by small producers (small and medium enterprises (SMEs)) for processing tofu, tempeh, and soy sauce (MOA, 2021B). Per capita consumption of these three food categories was 15.99 kg in 2020. Dependence on imports makes the country vulnerable to price fluctuations, which are common with all agricultural commodities. In addition, increases in prices paid by Indonesians for soybeans can result from depreciation of the rupiah.

Logistics Costs of Rice and Soybeans in Indonesia

Relatively high logistics costs remain a challenge to increasing competitiveness and improving commodity distribution flow within Indonesia. A number of studies (Armstrong and Associates, 2020; Banomyong et al., 2022; Santoso et al., 2021) have estimated a relatively high logistics cost for Indonesia at around 21–23% of its GDP, compared to just 11–15% for other developing countries (Armstrong and Associates, 2020). Transportation and inventory costs contribute the largest to total national logistics costs, accounting for 11.80% and 11.24% of the GDP respectively (Santoso et al., 2021), as shown in Figure 3.

Figure 3.
Indonesia's logistics cost components in 2004, 2010, and 2015 (% of total logistics costs)



Sources: Source: Santoso et al (2021

Transportation costs can be further broken down into land and sea transport, which account for 67.13% and 25.34% of total transportation costs, respectively (Santoso et al., 2021). Storage costs are responsible for 62.30% of total inventory costs. Administrative costs, typically a percentage of the fees charged for any cost incurred in transportation activities and procurement handling, have a relatively low contribution, 5.66% of the total logistics costs (Santoso et al., 2021). Practically speaking, administrative fees may include such cost components as charges and fees incurred during transport as well as insurance.[3]

[3] Based on the definition from Santoso et al. (2021), the transportation and inventory cost components here exclude additional costs such as charges and fees. Logistics actors include other costs such as charges and fees in the category of administrative costs related to transportation activities.

Rice and soybean logistics have a different cost breakdown than logistics generally in Indonesia. The contribution of logistics costs to the final price received by customers is expressed in the trade and transportation margin (*Margin Perdagangan dan Pengangkutan* or MPP). As seen in Table 1, total MPP at a given stage of the supply chain (10) is the difference between the purchase price when a good enters this stage of the supply chain (1) and the selling price when it leaves that stage of the supply chain (11). Processing costs are represented by rows 2–4, logistics costs by rows 5–8, and profit by line 9.

Table 1.
Marginal Contributions to Price, IDR/kg for Local Medium-Quality Rice in 2020

No.	MPP's Components	Producers (of milled rice)	Distributors/ Wholesalers	Retailers
1	Price from previous stage of distribution	5,700[4]	7,986	8,811
2	Grinding Fees	300	-	-
3	Drying Cost	100	-	-
4	Shrinking	736	-	-
5	Loading and Unloading Costs	50	50	50
6	Transportation costs	500	245	245
7	Packaging Fees	30	30	30
8	Monthly Cost of Capital	70	-	-
9	Profit[5]	500	500	700
10	**Total MPP (2) to (9)**	**2,286**	**825**	**1,025**
11	Price for next stage of distribution	7,986	8,811	9,836
12	**Logistics Costs (5) to (8)**	**650**	**325**	**325**
	% Logistics Costs of Total MPP (12)/(10)	28.43	39.39	31.71
	% Transportation Costs of Total Logistics Costs ((5)+(6))/(12)	84.62	90.77	90.77
	% Inventory Costs of Total Logistics Costs (7)/(12)	4.62	9.23	9.23
	% Administration Costs of Total Logistics Costs (8)/(12)	10.77	-	-

Sources: MOT, Report on the Analysis of the Transport and Trade Margin (MPP) of Staple Food Commodities (2021), processed by authors

[4] The price paid (to farmers or traders) for unmilled rice by the producers of milled rice.
[5] The profit margin in the dataset includes costs outside of transportation, logistics, and processing. These costs include employee/individual costs needed to carry out its business activities, product marketing costs, and other costs incurred to support sales activities. The profit margin less these additional costs is lower than indicated in the table.

Logistics costs contribute 28–40% of the MPP for rice. It represents the largest proportion of MPP at the distributors level, where it represents 39.39% of the total MPP. Meanwhile, for producers (of milled rice) and retailers, rice logistics costs contributed 28.43% and 31.71% to MPP respectively. Furthermore, transportation costs are the largest contributor to the rice logistics costs, amounting to 84.62% of the total logistics costs at the producers level and 90.77% of the total logistics costs at the distributors/wholesales/retailers level (MOT, 2021).

The contribution of inventory costs to total logistics costs is relatively low, below 10%. Meanwhile, administrative costs, which consist of capital costs, contribute 10.77% to the total logistics costs at the producer level (MOT, 2021).

Relative to the economy-wide cost of logistics represented in Figure 3, transportation costs represent a far greater proportion of the logistics cost for rice. Administrative costs also represent a larger share of the logistics cost for rice than they do for logistics nationally.

Table 2 presents the MPP breakdown for imported soybeans.

Table 2.
Marginal Contributions to Price, IDR/kg for Imported Soybeans in 2020

No.	MPP's Components	Importers	Distributors[6]	Wholesalers/ Retailers
1	**Price from previous stage of distribution**	**9,688**[7]	10,200	10,250
2	Port Charges	129	-	-
3	Stacking Fees	50	-	-
4	Quarantine Fee	90	-	-
5	THC Container	87	-	-
6	Trucking (Belawan-Importer Warehouse)	46	-	-
7	Sack Cost @ 50kg	54	-	-
8	Shrinking	7	-	-
9	Sack Packaging Cost	-	-	40
10	Transportation Costs (Expedition)	-	-	100
11	Loading Fee	-	-	13
12	Unloading Fee	-	-	30
13	Profit[8]	50	50	50

[6] According to the quoted study, the cost components at the distributor level are relatively small because distributors sell soybeans in sacks packaged by importers. The trucking cost is included in the selling price at the importer level. As a result, marginal contributions to the selling price at distributor level are considered to come from profits only.
[7] Landed price paid by importers.
[8] The profit margin in the dataset includes costs outside of transportation, logistics, and processing. These costs include employee/individual costs needed to carry out its business activities, product marketing costs, and other costs incurred to support sales activities. For distributors, profit is also assumed to cover miscellaneous costs during the distribution that do not come in the form of fees or charges. The profit margin less these additional costs is lower than indicated in the table.

No.	MPP's Components	Importers	Distributors[6]	Wholesalers/ Retailers
14	**Total MPP**	**512**	**50**	**233**
15	Price for next stage of distribution	10,200	10,250	10,483
16	**Logistics Costs ((2) to (12))-(8)**	**456**	**-**	**183**
17	% Logistics Costs to Total MPP (16)/(14)	88.96	-	78.54
18	% Transportation Costs to Total Logistics Costs ((5)+(6)+(10)+(11)+(12))/(16)	29.20	-	78.14
19	% Inventory Costs to Total Logistics Costs ((7)+(9))/(16)	11.75	-	21.86
20	% Administration Costs to Total Logistics Costs ((2)+(3)+(4))/(16)	59.06	-	-

Sources: MMOT, Report on the Analysis of the Transport and Trade Margin (MPP) of Staple Food Commodities (2021), Processed by Authors

For imported soybeans, logistics costs command the highest proportion of MPP for importers (88.96%) compared to wholesalers and retailers (78.54%). Transportation costs make up most of the logistics costs for wholesalers and retailers (78.14%), but only 29.20% of the cost for importers. Most (59.06%) of the logistics costs for importers are administration costs (MOT, 2021). Meanwhile, the contribution of logistics costs at the distributors/ wholesales level is relatively greater than at the retailer level for local soybeans (MOT, 2021).

> “Many components of the MPP are affected by government policies and regulations.”

The contribution of administrative costs to the logistics cost of both rice and soybeans is greater than the national, economy-wide average logistics costs. Many components of the MPP are affected by government policies and regulations, but especially administrative costs. For example, policies that focus on infrastructure and connectivity will influence transportation costs, while policies that focus on warehousing will affect inventory costs. Policies that focus on customs administration, ports, and terminals will affect administrative costs.

Government Programs to Reduce Logistics Costs: Regional Inequalities and the Sea Highway Program

Indonesia's archipelagic geography and unequal economic development have led to gaps in commodity prices between its western and eastern parts. Existing programs to reduce logistics costs have mostly focused on eliminating price disparities between the western and eastern parts of Indonesia for essential goods.

> "Existing programs to reduce logistics costs have mostly focused on eliminating price disparities between the western and eastern parts of Indonesia for essential goods."

At the end of 2022, the Market Monitoring System for Staple Goods (SP2KP) of the Ministry of Trade reported a price disparity for medium rice in West Sumatera, South Kalimantan, West Papua, North Kalimantan, Central Kalimantan, Gorontalo, and Papua. The average price of medium rice in these provinces was IDR 12,705 per kg, about 13% higher than the national average price of medium rice (IDR 11,200 per kg). Meanwhile, the Java region, the center of dried unmilled rice[9] production, recorded an average price of IDR 10,998 per kg.

There was a significant price disparity for imported soybeans in Southeast Sulawesi, Papua, West Papua, South Kalimantan, Bangka Belitung Island, Aceh, and Central Kalimantan. The average price of imported soybeans in these provinces was IDR 16,802 per kg, about 11% higher than the national average price (IDR 15,100 per kg). Again the average price in Java (IDR 14,950 per kg) was lower than the national average.

These disparities suggest that logistics costs between production regions and major ports in western Indonesia create price premiums for consumers in the eastern areas.

The eastern regions of Indonesia are less developed regions with lower populations, and so have access to less transportation and less frequent transportation, as well as fewer facilities such as warehouses. Road conditions and poor availability of trucks also affects land transportation time and cost for rice and soybeans between western and the eastern regions.

Kalem (2015) found a domestic cargo shipment imbalance between eastern and western Indonesia. Statistics Indonesia noted that ports in the eastern region of Indonesia had less loading activity compared to the western region in 2021, which is normal given generally lower economic activity in the east. This results in higher sea transportation costs, in part to cover empty shipping containers leaving the region[10] (Feng & Chang, 2008). Nurminarsih et al. (2015) also found that queues at ports reduce ship utilization and increase operational costs for sea transportation. Moreover, the limited delivery schedule[11] for goods to the eastern region makes it important to have a warehouse to be able to store large quantities of goods at one time.

[9] Dried Unmilled Rice (Gabah Kering Giling or GKG) is ready-to-mill rice paddy with maximum water level of 14% and maximum foreign materials 3%.

[10] Empty containers are transported by liner shipping companies with the same operational costs as for fully loaded containers, but without the revenue associated with cargo.

[11] For example, PT ASDP Ferry only has scheduled delivery of goods by ship at Lewoleba port once a week (Interview 1). In this case, building a warehouse in Lewoleba would increase storage capacity to help accommodate the infrequent schedule.

There are several government initiatives aimed at addressing these challenges and reducing the price gap between the western and eastern parts of Indonesia. Presidential Regulation No. 26/2012 on the Blueprint for the Development of the National Logistics System calls for the establishment of the National Logistics Ecosystem. The National Logistics Ecosystem includes the Sea Highway (Tol Laut) program, which has been operational since 2015. The Sea Highway refers to the regular operation of sea freights connecting hub ports with feeders between Sumatra and Papua, using large ships to achieve economies of scale and reduce unit costs.

"The National Logistics Ecosystem includes the Sea Highway (Tol Laut) program, which has been operational since 2015."

The Sea Highway was implemented through a PSO[12] scheme for the transport of staple goods (including rice and soybeans) to and from underdeveloped, remote, outermost, and border areas in accordance with predetermined routes.[13] The PSO is assigned to the state-owned enterprise operating in sea transportation, PT. Pelayaran Nasional Indonesia (PT Pelni).[14] The government compensates for the gap between the shipping rate set by the government and the actual reported cost of services, and there is no limit to the number of voyages covered by the subsidy (Ministry of Transportation (MOTr) Regulation No. 65/2018, Article 14(3)). The subsidy is applied on top of existing discounted shipping rates for the PSO program (MOTr Regulation No. 29/2018, Article 3).

The Sea Highway is plagued by shortcomings. First, as reported by the Commission V of the House of Representatives (DPR RI, 2021), while most areas connected by the Sea Highway saw between 4–20% reduction in the prices of staple goods under the program, some districts in eastern Indonesia such as Biak Numfor, Asmat, and Fakfak—all located in Papua Island—did not see any improvements in prices.

There is a cargo imbalance between the flows to and from the eastern region, inadequate port facilities and infrastructure, and irregular vessel schedules. Other barriers remain that may keep logistics cost high, related to warehousing, trucking, cargo loading/unloading, and other processes in and out of the port. The main achievement of the program is the significant increase in the volume of goods transported. Between 2016—one year after program implementation—and 2020, freight volumes increased by more than four times, from 81,400 tonnes to 362,560 tonnes. The main impact of the program is in encouraging demand for sea transportation and not necessarily addressing the uneven availability of ships and imbalanced cargo between the eastern and western regions.

A number of issues also arise because Sea Highway routes transport goods to smaller ports in underdeveloped and remote areas. According to an interview with the Head of Logistics Management of Bulog, this has consequences in terms of warehouse capacity and time. Small ports are usually equipped with relatively small warehouse capacity, which became a problem when more traffic was routed to the areas. When the volume of incoming cargo exceeds the

[12] A Public Service Obligation (PSO) is a mandate by the government that certain state-owned enterprises provide services at a specified quantity or price as deemed necessary for ensuring equal access by the public. A PSO is usually implemented through price controls or subsidies given to the appointed state-owned enterprises. It grants the appointee special advantages or even monopoly to operate in a given sector.

[13] Goods eligible to be transported under the PSO program are explained in Presidential Regulation No. 59/2020 and Ministry of Trade Regulation No. 53/2020. There are more than 100 eligible goods which cover foodstuffs, ready-to-eat meals, dry bulk commodities (such as construction and energy materials), garments, and medicine.

[14] Based on MOTr Regulation No. 4/2018, Article 6 and Presidential Regulation No. 27/2021, Article 6.

warehouse capacity, cargo is rerouted to another warehouse further from the destination port, increasing costs (Interview 2). Routes are also subject to closure or change based on a regular evaluation of minimum port utilization, creating uncertainty for port users (Interview 2). Other issues include infrequent shipping—as seldom as once a month in remote areas—and a lack of food-grade containers (Interview 2).

The Sea Highway program has provided some relief from the high prices associated with more remote locations in Indonesia, but not to all regions. It addresses high transportation costs through subsidies for PSO implementers, which does not solve reliability issues of transporting to remote areas. Instead, these subsidies accommodate the high costs of logistics in these regions without addressing the underlying causes of high logistics costs for staple goods in these regions.

> "Subsidies implemented by the Sea Highway program accommodate the high costs of logistics without addressing the underlying causes of high logistics costs for staple goods."

Reduced logistics costs can be achieved in a more systematic way by addressing regulations and policies that create or increase logistics costs. Using the examples of rice and soybeans, the next sections identify the applicable licenses, permits, and fees that increase monetary and time costs.

POTENTIAL REGULATORY COSTS IN RICE AND SOYBEAN DISTRIBUTION

There are many logistical challenges affecting the rice and soybean trade that originate from regulatory costs. Regulations can affect all steps of distribution, and the main difference between rice and soybeans is the importance of import procedures and customs clearance and inspection for soybeans, but not for rice. In agreement Santoso et al (2021), we found that regulatory costs can affect both transportation costs and inventory costs, the main components of logistics costs. Regulatory costs incurred in warehousing, shipping, and trucking are important for both goods.

We have identified 24 regulations from nine logistics processes related to rice and soybean that may add to logistics costs as well as their impact on logistics cost, outlined in Table 3. Potential costs have been classified into two main types: monetary and time costs. Monetary costs increase the overall cost while also requiring that transactions be completed so that the logistics process can continue to the next stage. Meanwhile, time costs increase the time required to complete related administrative processes to move through the logistics process. Time costs are usually related, but are not limited, to the completeness of documents and the integration of IT systems.

Table 3.
Potential Regulatory Impact on Rice and Soybean Logistics Cost

Logistics Process	Potential Regulatory Cost	Type of Cost	Regulation	Description
Import Process	Long-stay container fee	Monetary Cost	MOTr Regulation No. 25/2017	Fees for the transfer of goods past the deadline for stacking (long stay) at the main port of Belawan, the main port of Tanjung Priok, the main port of Tanjung Perak, and the main port of Makassar.
	Container eligibility requirements	Time Cost	MOTr Regulation No. 53/2018	Eligibility requirements for every container that will be used as part of the means of transportation on a ship. Containers must go through inspection, testing, certification, and supervision.
	Import documents submission to SINSW	Time Cost	MOT Regulation No. 25/2022	Importers must complete import documents electronically through the Indonesia National Single Window System (SINSW) and carry out obligations such as import realization reports.
Custom Clearance and Inspection	Import declaration documents	Time Cost	MOF Regulation No. 201/2019	Every importer is required to report their import activities through the Import Declaration (Pemberitahuan Impor Barang or PIB) documents.
	Tariffs on soybean imports	Monetary Cost	MOF Regulation No. 135/2012	Imposition of import duty tariffs on imported goods, affecting soybeans with a tariff post of 5%.
	Rules of origin	Time Cost	MOF Regulation No. 7/2022	Application for Certificate of Origin of Goods before Import by the applicant, which includes importers determined by the Director General in a preferential scheme or non-preferential scheme before submitting a Customs Declaration.
	Rules for the further transport of imported or exported goods	Time Cost	MOF Regulation No. 216/2019	Before entering the Customs Area, the Inward Manifest must be notified. Continuously Transported Goods are goods transported through the Customs Office without unloading and Further Transported Goods are goods transported through the Customs Office with prior unloading.

Logistics Process	Potential Regulatory Cost	Type of Cost	Regulation	Description
Custom Clearance and Inspection	Procedure for Submission of Inward Manifest Notification	Time Cost	MOF Regulation No. 97/2020	The carrier must notify the arrival plan, Inward Manifest, Outward Manifest, connect the system with the National Logistics Ecosystem (NLE), and provide Online Delivery Orders.
	Quarantine fee	Monetary Cost	Government Regulation No. 35/2016	The MOA can charge a fee for quarantine measures for a plant product. Imported soybeans are one of the plant products that must go through a quarantine process.
Delivery Process	Delay shipping schedule	Time Cost	MOF Regulation No. 97/2020	Procedures for Submitting Notification of Planned Arrival of Transportation Means, Arrival Manifest of Transportation Means, and Manifest of Departure of Transportation Means.
	Compliance sanctions	Monetary Cost		Sanction applied to those who do not comply with the conditions for submitting Inward Manifest notifications.
Rice Distribution	Government Purchase Prices for Rice	Monetary Cost	MOT Regulation No. 24/2020	Purchase price of domestic rice with quality maximum water content 14%, broken grain maximum 20%, groats content maximum 2%, and degree of grinding of at least 95% is IDR 8,300/kg.
Soybean Distribution	The reference purchase price and reference sale price	Monetary Cost	National Food Agency (NFA) Regulation no. 11/2022	The reference purchase price of local soybeans is set at IDR 10,775/kg and the reference sale price of local and imported soybeans are set at IDR 11,400/kg and IDR 12,000/kg respectively.
Warehousing	Value-added tax	Monetary Cost	Law No 42/2009	VAT bill of 11% x total rent is required to pay for the warehouse rental fee per square meter.
	Income tax	Monetary Cost	Income Tax Law Article 23	The income tax charged for rental services is 10%.
			Government Regulation No. 34/2017 article 4	
	Amount and duration of storage time	Time Cost	Presidential Regulation No. 71/2015	In the event of a shortage of goods, price fluctuations, and/or obstructions to the traffic of goods trade, rice storage is a maximum of 3 months.
	Warehouse receipt system registration process	Time Cost	MOT Regulation No. 14/2021 (Amendment of MOT Regulation No. 33/2020)	There are 20 goods that can be stored in warehouses in the implementation of a warehouse receipt system, including rice and soybeans. Storage of goods must meet the requirements, including a storage capacity of at least 3 months, meet certain quality standards, and meet the minimum number of goods stored.
Port Services	Delivery order online	Time Cost	MOTr No. 120/2017	Port Business Entities such as Terminal managers, sea transportation companies, transportation management service companies, and goods owner representatives, are required to implement an Online Delivery Order service system for Imported Goods.
	Mechanism of determining rates and port services	Monetary Cost	MOTr No. 84/2018	Port service fees, which consist of the fees for delay services, docking services, ship visiting times, and tariff-structured ship traffic arrangements, are obtained from the calculation of the cost per unit.

Logistics Process	Potential Regulatory Cost	Type of Cost	Regulation	Description
Sea Transportation (Shipping)	Bill of lading	Time Cost	Commercial Law Book (KUHD) Article 504-517	Bill of lading is a dated letter that explains that the forwarder has received the goods to be transported to a certain place, handed them over to a certain person, and under what conditions the goods will be delivered.
	Ship agency document	Time Cost	MOTr Regulation No. 65/2019	A national company that carries out the local ship and/or foreign ship agency activities must have a letter of appointment as a shipping agency.
Trucking	VAT on the provision of certain taxable services	Monetary Cost	MOF Regulation No. 71/2022	The imposition of a tax of 10% of the rate of VAT on freight forwarding services in which the bill of transportation management services contains freight charges.
	Appointment of a local freight forwarding company	Time Cost	MOTr Regulation No. 49/2017	The owner of the goods must appoint a local freight forwarding service where the activities of sending and receiving goods are carried out.
		Time Cost	MOTr Regulation No. 134/2015	Supervision of goods transportation loads by means of weighing equipment is carried out for all land transportation, except for container transport, oil/gas fuel tankers, dangerous goods transport, and heavy equipment.

Sources: Listed regulations, compiled and evaluated by authors.

Because transportation costs make up such a large proportion of total logistics cost in rice and soybeans, regulations affecting transportation should be prioritized. The cost of transportation will also greatly depend on the mode of transportation used, where each mode of transportation will have its own challenges and role in logistics cost.

“Because transportation costs make up such a large proportion of total logistics cost in rice and soybeans, regulations affecting transportation should be prioritized.”

Trucking (land transportation) is the highest contributor to transportation costs. These costs are increased by a value-added tax (VAT) on the provision of certain services, mandatory appointment of local freight forwarding services, and the requirement that motorized vehicles be weighed on the road. Mandatory appointment of local freight forwarding services will certainly pose an additional cost when there is limited availability in the area.

Shipping (sea transportation) is the second highest contributor to transportation costs. These costs are increased by the regulatory costs associated with bills of lading and ship agency documents. Regulatory costs also affect delivery orders online and the mechanism of determining rates and port services. The mechanism of determining port services fees will become crucial because inaccurate determination will be an unnecessary additional cost for logistics activities.

Inventory costs are increased by regulation through the VAT, income tax, the amount and duration of storage time, and warehouse receipt system registration process. The value-added tax and income tax directly increase inventory costs, while regulation of these other areas affects monetary cost indirectly through time cost.

One interview suggests that most inter-island logistics use sea transportation because sea freight is cheaper than land/air freight (Interview 3). Regulation related to calculating tariffs and port services is a main concern as business actors in sea transportation feel that the calculation does not reflect the real productivity of and services offered by a port.

Port productivity in servicing a ship (anchoring, loading, unloading, and sailing back) is the main factor affecting sea transportation logistics costs. Unstable or low port productivity has the potential to cause port congestion, increasing the risk of stacking that exceeds the time limit determined by the MOTr Regulation No. 25/2017. This will result in higher stacking fees, adding to the costs.

Rice logistics costs can be driven by the geographical location of the distribution center (Interview 3). The rules for appointing a local freight forwarding service will incur additional time costs when there is no availability within the local area. This is also a challenge for imported soybeans when they are distributed throughout Indonesia.

Table 1 shows that the logistics costs for rice transportation at the producer level are relatively higher than at the distributors/wholesales/retailers level. This shows that improvements in transportation sector regulation should be directed at the producer level.

The government's purchase price for rice, set through MOT Regulation No. 24/2020, and for soybeans, set through the NFA Regulation No.11/2022, are not able to respond quickly to changes in commodities and currency markets. These reference prices are intended to protect both producers and consumers by providing a pricing guideline for market actors. In the case of rice, the government also set the government purchase price (Harga Pembelian Pemerintah or HPP) which is used by Bulog and other SOEs to procure rice for food reserves. Too often the HPP is below the market price, which results in the procurement programs by Bulog and other SOEs being undercut by private players who can offer a higher bid. Meanwhile, the reference price for domestic soybeans is not able to keep up with the price of imported soybeans which is often cheaper (Interview 3).

Administrative costs are also an important component of logistics costs, especially for imported soybeans, and they are increased by regulations. Although sea transportation is used for both domestic and import logistics, transporting imported soybeans is more expensive at the importer level, where administrative costs make up more than half of total logistics cost, than at the wholesaler/retail level (MTO, 2021). Additional costs arise in the import process for soybeans through regulations that increase administrative costs through port charges, quarantine fees, and stacking fees. The mandatory quarantine for imported soybeans also increases both time and monetary costs. In addition, the need for a certificate of origin before making a customs declaration also has the potential to cause the additional time to carry out import activities.

RECOMMENDATIONS TO REDUCE LOGISTICS COST FOR RICE AND SOYBEAN TRANSPORTATION

Based on our assessment of the potential regulatory costs in the previous section, we recommend five changes to reduce the effect of regulations that increase rice and soybean logistics costs through both monetary and time costs. Table 4 presents our recommendations.

The distribution process for rice mostly consists of domestic trade, which uses trucks for intra-island delivery (within the island) and bulk carriers or dry container vessels for inter-island shipment (Interview 2). The soybean logistics process covers both international and domestic trade, using trucks for intra-island transport and dry container vessels for inter-island transport.

Regulatory improvements for rice logistics should be directed at supporting reductions in transportation costs on the producer side, supporting port tariff alignment with port productivity, and supporting the flexibility to respond to market prices.

The regulatory improvements for soybean logistics should be directed at supporting port tariff alignment with its productivity, optimizing quarantine activities, increasing policy efficiency on rules of origin, supporting reductions in transportation costs on the importer side, and supporting the flexibility of the reference price for soybean in response to imported soybean price dynamics.

Table 4.
Recommendations to Reduce Rice and Soybean Logistics Costs

No.	Recommendation	Related Regulation	Regulation Category	Impact
1	Regarding port services, the rates offered should reflect port productivity. The government should encourage improved productivity by setting a port service productivity threshold and providing incentives for ports that can reach this threshold. This can reduce the chance of stacking fees.	MOTr Regulation No. 84/2018	Customs administration, ports, and terminals policies	1. Rice Logistics Costs 2. Soybean Logistics Costs
2	The Directorate General of Customs and Excise should cooperate with customs authorities in soybean-exporting countries to better integrate the issuance of certificates of origin. This system integration will cut import time.	MOF Regulation No. 7/2022	Customs administration, ports, and terminals policies	1. Soybean Logistics Costs
3	The Ministry of Agriculture should update the quarantine method so that quarantine can begin before the ship enters the port/is waiting in line to dock—we propose using a quarantine ship or floating lab near the port of import. This can reduce unnecessary quarantine time and fees.	Government Regulation No. 35/2016	Customs administration, ports, and terminals policies	1. Soybean Logistics Costs
4	The rules for appointing only local freight forwarding services should be relaxed. Options should be added if there are limited fleets at local companies by appointing companies outside the local area to fill the vacancy. This can cut the delivery time of goods.	MOTr Regulation No. 49/2017	Infrastructure and connectivity policies	1. Rice Logistics Costs 2. Soybean Logistics Costs
5	The reference prices for rice and soybeans should reflect the market prices and act as a reference for public stock management for food security purposes. Food reserve policies should treat domestic and foreign sources of rice equally. Rather than relying solely on Bulog and SOEs, the government should consider providing incentives, such as interest subsidies, for private warehouses and logistics operators that manage food reserves in food-deficit regions or during a low season.	MOT Regulation No. 24/2020 NFA Regulation no. 11/2022	Warehousing policy	1. Rice Logistics Costs 2. Soybean Logistics Costs

These recommendations are focused on reducing logistics costs by reducing regulatory costs. In order to reduce transportation costs and inventory costs, more in-depth study is needed to complete a holistic analysis of the three main components of logistics costs and work towards reducing them for these staple products.

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Interview 3 - Prof. Dr. Ir. Dwi Andreas Santosa, MS., Center of Reform on Economics (2023, January 19). Focus Group Discussion.

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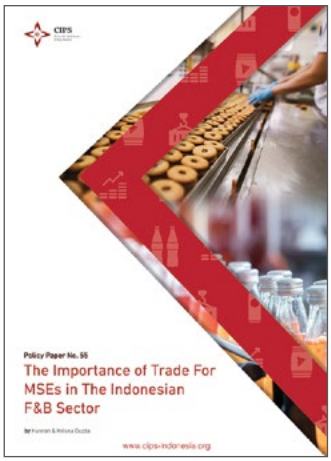

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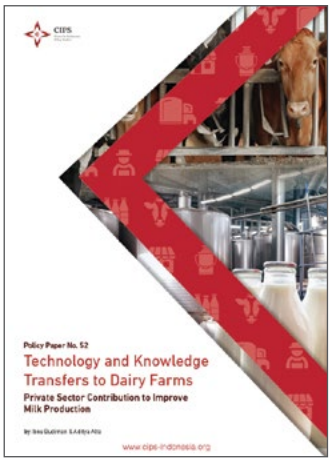

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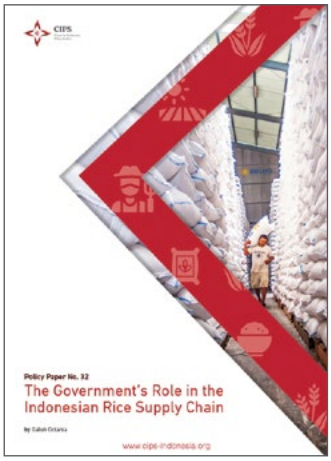

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