Subsidized Fertilizer Transaction Cost In Indonesia

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Abstract
The fertilizer policy has been in place since 1970. Unfortunately, this policy still has shortcomings, especially in transaction costs. This study aims to examine the transaction costs of subsidized fertilizers at the level of companies, distribution, retailers and farmer groups. The research method consists of survey methods in several regions in Indonesia and secondary data analysis methods by comparing the estimated transaction costs of raw material gas fertilizer subsidies urea based on market prices and company benchmark prices. Determination of the survey area using a purposive sampling technique based on areas that receive a large quota of subsidized fertilizers. The results showed that there had been transaction costs for subsidized fertilizers at the level of companies, distributors, retailers and farmer groups in various presentations and amounts. The causes of transaction costs are bounded rationality, asymmetric information, complex institutional hierarchy, incomplete contractual and procedural errors in determining the RDKK of prospective recipients of subsidized fertilizers. The estimated potential transaction costs at the company level during 2017-2020 are around Rp. 20.4 trillion, while the potential transaction costs in 2021 are around Rp. 3.4 trillion.

Keywords: subsidized fertilizer, transaction cost, indonesia

Introduction
The fertilizer subsidy policy has been in place since 1970 in Indonesia (more than 50 years). Direct subsidies, raw material subsidies and price subsidies are various policies that have been implemented during the 1970-2020 period in Indonesia. Various policies have been carried out to support food sovereignty and farmers' welfare through fertilizer subsidy scenarios.
Unfortunately, the fertilizer subsidy policy still raises the problem of transaction costs at various levels. Suryana et al (2016) in distributing subsidized fertilizers still generate transaction costs at various levels (producers, distributors, retailers and farmer groups). Transaction costs that occur at the producer level are the costs of procuring gas raw materials. The stipulation for the price of gas raw materials that exceeds the world market price is US$ 6 MMBTU – 9 US$ MMBTU and varies between fertilizer companies (world market price + US$ 3 MMBTU). Meanwhile, the proportion of costs for natural gas ranges from 63.2% to 83.5% of the BPP (Cost of Production) of each producer.

Rigi et al, (2019) as many as 41.67% of farmers bear the costs of loading and unloading transactions, causing the price of fertilizer paid by farmers to exceed HET (Highest Retail Price) in Solok Regency (West Sumatra). Additional transaction costs occur at the distributor and retailer level. Kholis and Setiaji (2020) around 90% of farmers pay subsidized fertilizer prices above the Highest Economic Price (HET) for the distribution of subsidized fertilizers in Batang Regency (Central Java). Abdullah and Hakim (2011) transaction costs that arise in the distribution of subsidized fertilizers in various regions in Indonesia cause fertilizer prices to exceed HET. Another obstacle that causes the distribution of subsidized fertilizers to be ineffective is the electronic data on the Definitive Plan for Group Needs (e-RDKK) and incomplete electronic data equipment at the retail level so that the distribution and use of farmer cards has not been effective (Wahyudi et al., 2021).

The farmer card is an electronic payment instrument for subsidized fertilizers used by farmers to buy subsidized fertilizers. The card can be used if the subsidized fertilizer price is in accordance with the HET. Unfortunately, the farmer card program has not been socialized properly and it is difficult for farmers to use the card (strong category) (Gunawan and Pasaribu, 2020). The farmer card can solve the problem of irregularities in the distribution of subsidized fertilizers, but its implementation is difficult when there is dualism in fertilizer prices (subsidized and non-subsidized). Price distortion triggers market deviation and failure (Kariyasa and Yusdja, 2005). Market failure is reflected in the increase in subsidized fertilizer prices which can reach more than 100% of the HET (Burhan et al., 2012).

Yustika (2008) Another trigger for transaction costs that can arise is the length of institutional heararchy in the decision-making process so that institutional performance is not effective and efficient. The trigger is the formal rules of the game and the play of the game which are not clearly regulated in the institutional system. This causes the relationship that is built between actors is asymmetric information, bounded rationality and incomplete contractual. These relationships give rise to transaction costs at the institutional level (Coase, 1937; Douglas, 1992; Williamson, 2008; Yeager, 2018).

The subsidized fertilizer policy is very strategic because it concerns the welfare of farmers and Indonesian food security. The transaction costs that have arisen have caused the subsidized fertilizer policy to have not been successful, both from the government side and the producers (companies). This study aims to examine the transaction costs of subsidized fertilizers at the level of companies, distribution, retailers and farmer groups. This research is expected to be able to provide alternative policies to solve the problem of subsidized fertilizer transaction costs.
Research Methods
This research method is conducted by field survey in the area receiving subsidized fertilizer in large numbers. Determination of the area was done using purposive random sampling technique. The surveyed area consists of 9 provinces with 13 districts in Indonesia, namely Jambi City (Jambi Province), Pandeglang Regency (Banten Province), Bogor City, Cianjur Regency and Indramayu Regency (West Java Province), Sleman Regency (Yogyakarta Special Region Province). Grobogan Regency and Blora Regency (Central Java Province), Lamongan Regency and Bojonegoro Regency (East Java Province), Sumbawa Regency (West Nusa Tenggara Province), Kutai Kartanegara Regency (East Kalimantan) and Bone Regency (South Sulawesi).

The sample size of respondents consists of 13 distributors, 52 retailers and 104 farmer groups divided into 13 provinces. The research used enumerator teams in several areas to speed up the process of inputting questionnaire results. This study uses 3 types of questionnaires, namely (1) questionnaires for distributors, (2) questionnaires for retailers and (3) questionnaires for farmer groups. Next, the enumerator conducted an interview with the respondent.

Transaction costs (TrC) in this study are categorized into four, namely corporate level transaction costs, distributor level transaction costs, retailer transaction costs, and farmer level transaction costs. The equations used for corporate transaction costs (TrC1), distributors (TrC2), retailers (TrC3) and Farmers (TrC4) are:

\[ \text{TrC}_j = \sum T_n C_n \]

The ratio is the division between each component of transaction costs to the total transaction costs (Z) calculated using the formula:

\[ Z_{ij} = \frac{Z_{ij}}{\text{TrC}_{ij}} ; \sum z_{ij} = 1 \]

Fertilizer Raw Material Corporation Transaction Cost
The transaction cost measured at the producer level is the transaction cost of the gas raw material price. The price of gas raw materials for urea fertilizer exceeds the base price of the international market, which is US $ 6 MMBTU - US $ 9 MMBTU, while the world market price is around + 3 US $ MBBTU. The difference in price is the cost of political transactions that will be calculated in this study.

Transaction Cost Analysis at the Level of Distributors, Retailers and Farmer Groups
The implementation of subsidized fertilizer distribution involves distributors, retailers and farmer groups. As a separate entity from the manufacturer at the distributor level, the distributor has a separate transaction cost with the manufacturer. At least the transaction costs that arise are not much different conceptually from the manufacturer's transaction costs.

- Transaction cost of distributors, retailers, farmer groups = General cost + e-RDKK cost + Quota cost + Distribution cost
- General cost = Information costs + Involvement in the program + Partner cooperation + Maintaining cooperation
• E-RDKK cost = e-RDKK submission process + e-RDKK Meeting + Data collection process
• Quota cost = Supervision of fertilizer sales quota + Fertilizer quota cost + Additional quota cost of subsidized fertilizer
• Distribution cost = Distribution cost - Cost of facilitating distribution
• The cost of the transaction process of buying and selling fertilizer
  The transaction cost components at the retailer level at least include:
  (1) Information costs are costs incurred by distributors, retailers and farmer groups to obtain information related to subsidized fertilizers, procedures and mechanisms for obtaining fertilizers, the amount of fertilizer quota that can be received and other related information.
  (2) The cost of implementing the e-RDKK program is the cost incurred by retailers to take care of matters related to administration and legality to obtain a subsidized fertilizer distribution cooperation contract, including various types of costs in the management of matters of administration, licensing and files -register file, data collection, and subsidized fertilizer intake.
  (3) Quota costs are costs incurred by distributors, retailers and farmer groups to obtain guarantees or maintain their position as part of the subsidized fertilizer distribution channel, including meeting costs or other intimacy activities.
  (4) Distribution costs are costs incurred in the process of transferring-warehousing and transportation of subsidized fertilizers.

Results And Discussion

Transaction Costs at the Raw Material Provider Level
Vulnerable In 2017-2020, the lowest world gas price occurred in 2020, which was 2,204 US $ MMBTU, while the highest price in 2017 was 3,015 US $ MMBTU. While the price set by the fertilizer industry in 2017 is an average of 9 US $ MMBTU and in 2018-2020 the price set by the fertilizer industry is an average of 6 US $ MMBTU. The highest price difference between the world price and the price of the fertilizer industry occurred in 2017 which is 5.99 US $ MMBTU while the lowest price difference in 2018 which is 2.95 US $. In aggregate, the gas difference borne by the government as a subsidy burden in 2017-2020 is 16.27 US $ MMBTU. The value borne by the government leads to inefficiency in fertilizer production. The amount of fertilizer production using world prices can result in higher production thus potentially increasing the capacity of fertilizer production. Furthermore, the use of world prices can correct the fulfillment of fertilizer needs to be greater.

Transaction costs arise at the producer level as a result of rent hunting that pursues monopoly market positions (Tullock, 1967), that pursues profit by using government power (Rowley et al., 2013). Producing firms derive great benefits from monopolies through price makers (Mankiw, 2014; Damanhuri & Findi, 2014). The monopoly profit obtained by entrepreneurs is based on gas prices at the level of 6 US $ - 9 US $, not based on world market prices, thus increasing the transaction cost of fertilizer companies. The following is the
estimated transaction cost and potential loss to the country by using the price of gas raw materials pegged by the industry is presented in Table 32.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>4,245,000</td>
<td>93.47 million</td>
<td>13,300</td>
<td>9</td>
<td>3.02</td>
<td>11,18 T</td>
<td>3.74 trillion</td>
<td>7.44 trillion</td>
</tr>
<tr>
<td>2018</td>
<td>4,250,000</td>
<td>93.58 million</td>
<td>13,500</td>
<td>6</td>
<td>3.05</td>
<td>7.58 T</td>
<td>3.84 trillion</td>
<td>3.73 trillion</td>
</tr>
<tr>
<td>2019</td>
<td>3,825,000</td>
<td>84.22 million</td>
<td>15,000</td>
<td>6</td>
<td>2.47</td>
<td>7.58 T</td>
<td>3.11 trillion</td>
<td>4.46 trillion</td>
</tr>
<tr>
<td>2020</td>
<td>4,025,467</td>
<td>88.64 million</td>
<td>14,400</td>
<td>6</td>
<td>2.21</td>
<td>7.65 T</td>
<td>2.81 trillion</td>
<td>4.48 trillion</td>
</tr>
</tbody>
</table>

Each ton of subsidized urea fertilizer requires 22.02 MMBTU of liquefied natural gas. The gas is used to produce Ammonia (NH3) and Carbon dioxide (CO2) (Nafkiyah, 2017). The government allocated 4.24 million tons of urea fertilizer in 2017 with an estimated gas demand of 93.47 million tons. The budget required by the fertilizer industry when using the gas price of 9 US $ MMBTU is Rp11.87 T while the budget required when using the world gas price is around Rp 3.74 T. In 2017, the difference between the highest cost estimate between the world gas price and the peg gas price by the fertilizer industry, namely Rp 7.44 T. The lowest price difference occurred in 2018, which is Rp 3.73 T. The total transaction cost due to the difference in world gas prices with the price set by the industry based on the allocation of Urea subsidized fertilizer is Rp 20.48 T. If the government sets the world price as the price of gas raw materials urea fertilizer, then the average difference in the vulnerable Year 2017-2020 is Rp 5.12 T. This means, the government can increase the allocation of urea fertilizer up to 5 million tons (estimated) to 17.05 million farmers (registered RDKK) and 5.33 million which has not been registered e-RDKK (BPS, 2018). The high cost of transportation on gas raw materials causes the government to be able to meet an average of 38 % of the total national subsidized fertilizer needs (Bappenas, 2021). Transaction costs that arise as a result of rent seeking at the producer level cause public welfare to be lost (Rowley et al., 2013; Del Rosal, 2011).

The transaction costs that arise are detrimental to two parties, namely (1) the government as the owner of the budget and (2) farmers as the recipient of subsidized fertilizer. The potential loss of government budget due to transaction cost is around Rp 20.48 T while farmers lose the opportunity to obtain welfare due to production inefficiency, the target of subsidy recipients is much lower. Farmers are the most disadvantaged because they often experience a shortage of fertilizers due to demand far beyond supplies so that farmers lose their livelihood.

**Transaction Costs at The Level of Distributors, Retailers and Farmer Groups**
Based on the results of the field survey, there are 9 (nine) types of transaction costs that were successfully identified in groups of farmers, 7 (seven) types of transaction costs that appear at retailers and 7 (seven) types of transaction costs at distributors. Costs that arise at the distributor level, include the cost of working with partners; the cost of the e-RDKK submission process; e-RDKK socialization meeting; the cost of the e-RDKK data collection process; the cost of monitoring fertilizer sales quotas; subsidized fertilizer distribution costs; and costs to streamline the distribution process. Of the seven costs, the distribution cost is the largest cost borne by the distributor in the transaction cost component. There are 53.85 percent of distributor respondents who spend the cost of fertilizer distribution.

At the retailer level, there are 7 (seven) transaction costs that arise, namely the cost to participate in the subsidy fertilizer program; the cost of the e-RDKK submission process; e-RDKK socialization meeting; the cost of the e-RDKK data collection process; subsidized fertilizer distribution costs; costs to streamline the distribution process; and additional costs for processing subsidized fertilizer transactions. The distribution cost became the cost incurred by 15.4 percent of kiosk respondents.

Furthermore, at the poktan level, there are 9 (nine) transaction costs that arise, namely the cost to obtain information about the subsidized fertilizer program; costs to participate in subsidized fertilizer programs; the cost of the e-RDKK submission process; the cost of e-RDKK socialization meetings; the cost of the e-RDKK data collection process; additional costs to obtain additional quotas of subsidized fertilizers; subsidized fertilizer distribution costs; costs to streamline the distribution process; and additional costs for processing subsidized fertilizer transactions. Meeting costs related to the dissemination of e-RDKK became the most cost incurred by farmers' groups where 19.23 percent of respondents spent costs for meetings in order to discuss e-RDKK.

The emergence of transaction costs in the distribution of subsidized fertilizers due to uncertainty in economic exchange that is the enforcement of rules, the formal rules of the game of values and culture (North, 1992; Williamson et al, 2008; Yeager, 2018). Deviant behavior in the distribution of subsidized fertilizers is part of the externalities (Coase, 1937). Therefore, the enforcement of internal rules through the formal rules of the game must be enforced to the play of the game that deviates from the distribution of subsidized fertilizers in the form of reward and punishment (Williamson et al., 2008). The main weakness of the subsidized fertilizer processing and distribution policy is the lack of clear rules regarding punishment and rewards.

Based on the field data, two dominant variables were found to be the burden of all stakeholders related to subsidized fertilizer, namely (1) the cost burden spent for e-RDKK data collection of subsidized fertilizer and (2) the cost burden associated with subsidized fertilizer distribution process. Meanwhile, the information cost burden and the cost burden related to subsidized fertilizer quotas appear at the farmer group level. Williamson et al (2008) incomplete contract and asymmetric information are the cause of large transaction costs at various levels of subsidized fertilizer distribution. Contracts with unclear regulations have the potential to give rise to various kinds of speculations that create transaction costs. Furthermore, the asymmetric information between the principal (distributor) and the agent (farmer) has the potential to harm one of the parties. This is evident, there are some groups of farmers do not know the highest HET price of 0.96% of respondents.
The largest cost burden related to e-RDKK data collection is the stage of meeting (coordination) of e-RDKK data collection, as many as 19.23% of respondents stated that they incur costs at the meeting. In addition, respondents also stated that at other stages of e-RDKK also caused them to have to spend costs, such as the data collection stage and e-RDKK submission stage of 5.77% and 7.69% of respondents, respectively. At this point, the conclusion of the analysis can be drawn that the cost burden that arises at the stage of e-RDKK causes the cost of the product to increase so as to impact the emergence of profit-seeking behavior from the distribution parties as a replacement cost for this burden.

Meanwhile, in the variable of subsidized fertilizer distribution, there are 57% of respondents at the distributor level and 15% of respondents at the retailer level incurring transaction cost in the process of distributing subsidized fertilizer. This is not in accordance with Permentan number 28 of 2020 on the Basic Price Component of Subsidized Fertilizer Sales for the Agricultural Sector which states that the cost of subsidized fertilizer distribution should be included in the calculation of HPP (Basic Production Price), the detailed cost component is (1) bulk shipping cost/freight ship bulk, (2) cost of bag ship/ freight ship bag, (3) cost of survey, (4) cost of unloading/ loading line II, (5) cost of rent/ staple warehouse line II, (6) cost of transporting line II to line III , (7) line III unloading/ loading costs, (8) line III warehouse rental/ stamping costs and (9) general administration costs up to line III. Furthermore, at the farmer level, there are 4.4% of farmers’ groups incurring transaction costs to facilitate the distribution of subsidized fertilizers. A detailed presentation of the composition of transaction costs at the level of distributors, retailers and farmer groups is presented in Table 1.

Table 1 Composition of transaction costs

<table>
<thead>
<tr>
<th>Cost Types</th>
<th>Distributor (%)</th>
<th>Retailer (%)</th>
<th>Farmers (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
<td>Exist</td>
<td>None</td>
</tr>
<tr>
<td><strong>Common Costs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Getting Information</td>
<td>100.00</td>
<td>0.00</td>
<td>100.0</td>
</tr>
<tr>
<td>Involvement in the Program</td>
<td>100.00</td>
<td>0.00</td>
<td>96.2</td>
</tr>
<tr>
<td>Cooperating with Partners</td>
<td>92.31</td>
<td>7.69</td>
<td>100.0</td>
</tr>
<tr>
<td>Maintaining Cooperation</td>
<td>100.00</td>
<td>0.00</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Cost Related to e-RDKK</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e-RDKK Application Process</td>
<td>92.31</td>
<td>7.69</td>
<td>96.15</td>
</tr>
<tr>
<td>e-RDKK Gathering</td>
<td>84.62</td>
<td>15.38</td>
<td>90.38</td>
</tr>
<tr>
<td>Data Collection</td>
<td>84.62</td>
<td>15.38</td>
<td>90.38</td>
</tr>
<tr>
<td><strong>Quota Cost</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervising fertilizer sales quota</td>
<td>92.31</td>
<td>7.69</td>
<td>100.0</td>
</tr>
<tr>
<td>Getting Fertilizer Quota</td>
<td>100.00</td>
<td>0.00</td>
<td>100.0</td>
</tr>
<tr>
<td>Getting Additional Quota</td>
<td>100.00</td>
<td>0.00</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Distribution Cost</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Cost Types | Distributor (%) | Retailer (%) | Farmers (%)  
---|---|---|---
Subsidized fertilizer distribution costs | None: 46.15 | Exist: 53.85 | None: 84.6 | Exist: 15.4 | None: 92.31 | Exist: 7.69
Costs to streamline the distribution process | None: 46.15 | Exist: 53.85 | None: 84.6 | Exist: 15.4 | None: 92.31 | Exist: 7.69
Cost of buying and selling subsidized fertilizers | None: 100.00 | Exist: 0.00 | None: 84.6 | Exist: 15.4 | None: 96.15 | Exist: 3.85

Source: Processed data

The largest transaction costs appear at the distribution level, namely the cost of fertilizer distribution and the cost of smoothing the distribution of fertilizer, amounting to Rp 340,433,333 and Rp 325,000,000, respectively. The cause of the amount of transaction costs at the distributor level is due to the distribution of subsidized fertilizer to several points of retail traders. Distribution transaction costs and smooth distribution are also very high at the level of retail traders, respectively, amounting to Rp 18,603,333 and Rp 50,700,000. Furthermore, the largest transaction cost at the farmer group level occurred during the e-RDKK meeting, the addition of fertilizer quota and smoothing the distribution of Rp 350,000, Rp 600,000 and Rp 791,147, respectively.

The transaction cost component in a very large fertilizer distribution is the transportation cost. Distributors, retailers and farmer groups add transaction costs beyond regulatory requirements. Transaction costs that occur at each level of fertilizer distribution cause the price of subsidized fertilizer to exceed the price of HET. Farmers as end consumers are the most disadvantaged parties in the process of distributing subsidized fertilizers.

Transaction costs also began to appear at the time of determining the potential recipients of subsidy fertilizers through e-RDKK meetings. There are parties who take advantage of the distribution of subsidized fertilizers to farmers by attracting transaction cost. The party takes advantage of the weakness of the bargaining value of farmers’ groups through the increase in transaction cost rates. The estimated transaction cost of e-RDKK meetings at the level of distributors, retailers and farmer groups is Rp 550,000, Rp 105,000 and Rp 350,000, respectively. The potential loss for farmers from transaction costs appears to be around Rp 3.47 trillion. In detail, the amount of transaction costs at the level of distributors, retailers and farmer groups are presented in Table 2.

Table 2 Average Transaction cost Amount per Year in Rupiah

<table>
<thead>
<tr>
<th>Cost Types</th>
<th>Distributor</th>
<th>Retailer</th>
<th>Farmer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Cost</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Getting Information</td>
<td></td>
<td></td>
<td>100,000</td>
</tr>
<tr>
<td>Involvement in the Program</td>
<td></td>
<td></td>
<td>500,000</td>
</tr>
<tr>
<td>Cooperating with Partners</td>
<td></td>
<td></td>
<td>1,000,000</td>
</tr>
<tr>
<td>Maintaining Cooperation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost Related to e-RDKK</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e-RDKK Application Process</td>
<td></td>
<td></td>
<td>5,000,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>115,000</td>
<td>71,667</td>
</tr>
<tr>
<td>Cost Types</td>
<td>Distributor</td>
<td>Retailer</td>
<td>Farmer</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-------------</td>
<td>----------</td>
<td>--------</td>
</tr>
<tr>
<td>e-RDKK Gathering</td>
<td>550,000</td>
<td>105,000</td>
<td>350,000</td>
</tr>
<tr>
<td>Data Collection</td>
<td>100,000</td>
<td>100,000</td>
<td>57,500</td>
</tr>
<tr>
<td><strong>Quota Cost</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervising fertilizer sales quota</td>
<td>100,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Getting Fertilizer Quota</td>
<td></td>
<td>1,000,00</td>
<td>600,000</td>
</tr>
<tr>
<td>Getting Additional Quota</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Distribution Cost</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subsidized fertilizer distribution costs</td>
<td>340,433,33</td>
<td>18,603,33</td>
<td>287,500</td>
</tr>
<tr>
<td>Costs to streamline the distribution process</td>
<td>325,000,00</td>
<td>50,700,00</td>
<td>791,147</td>
</tr>
<tr>
<td>Cost of buying and selling subsidized fertilizers</td>
<td>1,172,12</td>
<td>200,000</td>
<td>4</td>
</tr>
</tbody>
</table>

Source: Field data processed

Based on the results of the field findings, there is a transaction cost in almost all subsidized fertilizer distribution lines. The cause of transaction cost is due to the lack of enforcement of rules and the formal rules of the game in the distribution process (Douglass, 1992; Williamson et al, 2008; Yeager, 2018). Furthermore, transaction cost occurs due to asymmetric information related to distribution process costs, subsidized fertilizer HET and unclear roles of the game (Williamson et al, 2008. Furthermore, the institutional hierarchy is very complex, namely (1) regional leaders to the ministry of agriculture and (2) the distribution of subsidized fertilizers from material supply companies, distributors, retailers and farmer groups. The complex institutional hierarchy causes transaction costs to arise.

The relationship established between distributors and farmers receiving subsidized fertilizers is incomplete contractual so that there is uncertainty of distribution costs that are misused by parties who do not clearly understand the regulations and the roles of the games (Williamson et al., 2008). There are costs that arise that are not clearly regulated in the regulations so as to cause transaction costs in the distribution process to the detriment of farmers.

The institutional aspects possessed by community communities (farmers and peasant groups) as a cognitive framework (norms, customs) to encourage collective action began to degrade so that they had difficulty making corrections collectively (Ostrom, 1990). Furthermore, farmers as the basic determinants of desire and determinants of the utility of subsidized fertilizers cannot be optimized well because the utility is in favor of distributors (Becker, 1974). Collective actions that are already centered on farmer groups are in a diametrical position with distribution companies so that they tend to be passive in receiving information and policies from subsidized fertilizer distribution companies. As a result, all policies run asymmetric informational and one way policy without any correction (two way) from the farmer group. The government needs to clearly implement the roles of the game,
enforce rules and laws, improve the institutional structure to reduce the uncertainty of subsidized fertilizer distribution.

**Farmer Losses and Institutional Economic Relevance**

Based on the calculation of the survey results, the transaction cost of determining the recipient and distribution of subsidized fertilizer is estimated at Rp 3.47 Trillion. Sources of transaction costs are found at the level of distributors, retail kiosks and farmer groups. Furthermore, the price of gas raw materials that are pegged as production raw materials exceeds the world market price, which contributes to the total transaction costs.

Furthermore, at the level of fertilizer distribution, there have been transaction cost at the level of distributors, retail kiosks and farmer groups. Transaction costs incurred include e-RDKK submission, meeting and data collection cost, quota cost and distribution cost. This shows that the subsidized fertilizer policy has many weaknesses, ranging from the process of determining farmers who are entitled to subsidized fertilizer, determination of quotas and distributors because it creates high transaction costs that harm farmers as final consumers (final demand). Williamson explained that the causes of possible transaction costs are (1) bounded rationality, (2) asymmetric information, (3) principle-agent, (4) institutional change, (5) hierarchy and (6) coorporate governance has not worked well (Williamson et al., 2008).

Bounded rationality is embedded in the institutional framework, causing myopia among stakeholders, especially farmers. Rational limitations lead to the emergence of information costs (Simon, 1972). Bounded rationality that makes the transacting party unable to estimate all possible transaction costs so as to cause contractual incompleteness in the distribution of subsidized fertilizer. Furthermore, incomplete contractual fertilizer distribution causes greater transaction costs to be borne by farmers. Bounded rationality and incomplete contractual cause farmers to experience asymmetric information at various levels of fertilizer distribution. This can be evidenced by the high transaction cost. Furthermore, the difference in transaction costs of subsidized fertilizer distribution in each region increases the cost of organizing the transaction (Coase, 1937).

This position is increasingly detrimental to farmers because the relationship built by the EPR with certain bureaucracies and political elites uses monopoly-monopsony and oligopoly-oligopsony mechanisms. In this situation the EPR has greater authority to regulate fertilizer distribution and possible transaction costs that arise. This is why the government-entrepreneur-farmer relationship requires renegotiation to determine a fertilizer subsidy distribution model that can reduce transaction costs and overcome the EPR through complete contractual.

Furthermore, the cause of other transaction costs in fertilizer distribution is the very complex and long hierarchy of subsidized fertilizer distribution institutions. This is why firms, government -represented bureaucracies must rely on hybrid modes of governance and on a combination of hierarchies, markets, and long -term network collaborations to manage complex problems posed by innovation, fragmented markets and chain of transactions (Williamson et al., 2008).

The determination of subsidized fertilizer policy has a very complex hierarchy in terms of regulation and political policy, namely (1) the determination of potential recipients of subsidized fertilizer that goes through the stages of farmers-farmer groups-extension-village
government-district government-agricultural service-regent-provincial agricultural service- 
governor-director general-minister of agriculture-to socialization, (2) distribution of subsidized 
fertilizer through 6 lines, namely line I-line II-line III-line IV-line V and line VI, (3) 
determination of distributor companies and suppliers of raw materials through competition 
which tends to lead to the EPR and (4) regulation of fertilizer distribution systems at the 
legislative level. The fertilizer policy hierarchy system has a lot of gaps causing EPR and 
transaction cost. Therefore, a hybrid hierarchy is needed that facilitates supervision and 
implementation (related to cooperate governance), asymmetric markets and long -term 
relationships between farmers and distributor companies and bureaucracies. 

According to Williamson, an important step to be taken is to set "the formal rules of the 
game" regarding the constitution and political system. Furthermore, government institutions 
need to regulate "the play of the game" related to actors in market structure (eg competitive 
market), contractual or transactional relationship structure and vertical and horizontal structure 
that form the basis of stakeholder relations, in this symmetrical relationship between 
stakeholders in fertilizer policy. subsidized (Williamson et al., 2008). The play of the game 
must be done openly or through open mechanisms so that farmers have many choices of 
fertilizers and do not rely on monopoly market mechanisms. This will reduce the potential 
transaction cost. Furthermore, the government must remain present through the direct subsidy 
mechanism through farmers' cards to farmers. 

Subsidized Fertilizer Policy Formula 
The fertilizer subsidy policy should shift to direct subsidy through digital -based farmer cards 
using 1 price. The formal rules of the game "related to the constitution and the political system 
and actors (the play of the game) that are not in line cause transaction costs at the macro level 
(raw material provider companies), meso (distributors) and micro (retailers and farmers 
groups) have causing a very high transaction cost, thus creating a distortion of fertilizer prices 
and market failure. The direct subsidy and 1 price policy no longer involves distributor 
companies as regulators of fertilizer distribution but is fully open but well 
-institutionalized. The market mechanism is not fully operational because there is still government involvement 
in regulating the institution and protecting farmers through direct subsidies and farmer cards. 

At the meso level, the quota distribution system will automatically disappear due to the 
use of direct subsidy models and farmer cards. The quota distribution system that is expected 
to use a backing system (has transaction costs) will be lost because fertilizer will be distributed 
based on the area of agricultural land and the needs of each area. This will eliminate the 
transaction cost at the meso level. The division of quotas and the structure of the monopoly 
market needs to be done openly (the cooperation mechanism does not use a natural monopoly 
system but involves several participating companies). The play of the game must understand 
the mechanism and allocation of subsidized fertilizers. Structural relationships must be 
symmetrical and completely contractual. 

Furthermore, the distribution mechanism using farmer cards will record the identity of 
farmers or farm workers more rigidly so that the opportunities for improperly targeted fertilizer 
distribution can be minimized. The farmer's card must contain the same identity as the Resident 
Identification Card accompanied by additional information on employment as a farmer or farm
laborer and the area of cultivated land. Farmers' cards will also be added with information on the types of agricultural cultivation efforts and production produced by each planting period. Furthermore, the use of farmer's cards that record the area of cultivation can be used as a justification for the need for kilograms of subsidized fertilizer that is suitable for each cultivated land. This is an effort to anticipate the inefficient and ineffective use of excessive fertilizer by farmers. This system will eliminate the opportunity of transaction cost at the meso level.

At the micro level, transaction cost opportunities at the level of retailers and farmer groups can be avoided because the basis used to take subsidized fertilizer is the farmer's card. When farmers take subsidized fertilizer, the data is directly recorded into the digital system, thus reducing the risk of targeted errors. The government is also easy to conduct surveillance at any time based on the digital data collection. The direct subsidy mechanism by using digital farmer cards will eliminate and reduce transaction costs at the micro level. This description shows that direct fertilizer subsidies to farmers through digital cards will gradually eliminate rent hunting behavior at the macro and meso levels as well as reduce transaction costs at all levels. Therefore, fertilizer subsidy policy should be a combination of policies such as market openness (not entirely perfect competition still involves non-market institutions), fiscal policy through government instruments, protection and institutions. The detailed scenarios of the subsidized fertilizer policy combination are presented in the following table 3.

Table 3 Scenarios of subsidized fertilizer policy combinations

<table>
<thead>
<tr>
<th>No.</th>
<th>Policy</th>
<th>Description</th>
<th>Strength</th>
<th>Weakness</th>
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</table>
| 1.  | openness, not based on natural monopoly but involving the play of the game and updating profit margins and gas raw material prices | Encouraging fertilizer price to overcome market failure. | - The company will maintain product quality to increase competitiveness.  
- Preventing rent-seeking behavior (block system, mark-up, mark-down, monopoly-oligopoly and monopsony-oligopsony) because the company will be burdened with transaction costs that have an impact on competitiveness (Damanhuri, 2010). | - SOEs in the fertilizer sector have low technology, so technology transformation is needed.  
- Human resources that need to be improved. |
| 2.  | Protecsionism and rule of the game (Yustika, 2020) | The government continues to protect farmers through direct subsidies and | - Farmers still get protection from the input side.  
- Shifting the protection | - Creating dependency of farmers.. |
<table>
<thead>
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<tr>
<td></td>
<td></td>
<td>digital farmer cards and fingerprints.</td>
<td>mechanism from entrepreneurs to farmers so that the market structure is no longer monopolies</td>
<td>- Reducing the independence of farmers.</td>
</tr>
</tbody>
</table>

Source: Writer

Liberal theory known as laissez-faire and laissez passer means that government intervention must be minimized or "minimum state". Product prices in an economy with a liberal system are coordinated by the market as well as a working market signal. The economic actors are free to enter and exit the market (free entry and exit barriers). The experience of this research shows that there has been rent seeking at the macro, meso and micro levels. That means that institutional mechanisms do not work well due to collusion built by rulers and businessmen. To avoid transaction costs and abuse, the fertilizer price solution should have 1 market price. Farmers are given many benefits because they have the freedom to choose quality products. On the other hand, the company will not take rent action because it will burden the company's production costs so as to impact on competitiveness. Therefore, the proper formula to avoid farmers in monopoly markets is to shift the fertilizer subsidy policy through a 1 price policy. Policy 1 price aims to reduce production costs, especially in the provision of gaseous raw materials that reach almost 80% to produce urea fertilizer. Thus, the government and PIHC need to follow up the price of gas raw materials in accordance with the world market price of +3 US $ MMBTU.

However, the role of the government is still needed to strengthen and protect farmers in terms of financing and regulation. The government still needs to conduct protection activities for farmers through direct subsidies to farmers and institutional regulation (Yustika, 2020). Protection of farmers through direct subsidies by using farmer cards and fingerprints. Direct subsidies can unravel complex and tiered institutional issues at the time of subsidy fertilizer distribution. The central government can directly transfer directly to farmers who are entitled to fertilizer subsidies. Direct subsidy is an effort to change the subsidy mechanism from the
protection of entrepreneurs to the protection of farmers. The government provides direct protection to farmers through the transfer of fertilizer subsidy funds.

Furthermore, this farmer card is digitally based and contains information related to age, land area, status (as a farmer or farm laborer), number of families, type of commodity, fertilizer needs of each land area, production of each planting season, income from farming and various important information that supports these farmers are eligible for subsidies. Farmer cards are not only used as a formal requirement but must be equipped with accurate information related to farmers receiving farmer cards. Farmer card data can also be synergized with data from the ministry of social work to determine whether farmers belong to the poor and the poor range so that they belong to the Hope Family Program. Data integration in one ministry can be used by other ministries as justification for farmer card recipients. This will certainly reduce the potential for misuse of the subsidy budget and strengthen government oversight.

Institutional mechanisms will be easy to control because the data is integrated into one data that can be used by all institutions. This can make it easier for the government to conduct oversight. The amount of transaction cost can be avoided at both the macro, meso and micro levels because the institutional mechanism applies standard for all ministries. Evaluation of the policy becomes easier because the card will display the progress of the subsidy recipient information directly.

In the context of subsidized fertilizer policy, competition remains recognized as part of the policy instrument for building competitiveness. Therefore, the fertilizer industry should be opened more widely to provide alternative options for final demand, especially from farmers. However, the presence of non-market institutions must still exist to avoid market failure, especially final demand and farmers.

The presence of non-market institutions will cover the weaknesses of perfect competition, especially overcoming information asymmetries and externalities that arise from rent seeking behaviour. This means that the government encourages market openness at the macro level but presents non-market institutions at the meso and micro levels. What is the form of institutional contribution at the meso level, which is to ensure policies and the provision of accurate data for subsidized farmers. Furthermore, the data has a level of accuracy that can be accounted for and gained public recognition. Furthermore, the government and Pupuk Indonesia Holding Company (PIHC) need to properly manage the role of the game and the play the game on subsidized fertilizer policy through complete contractual accompanied by punishment and reward. The rules of the game must be enforced on anyone who abuses the rules and gives rewards to other companies and institutions.

The role of non-market institutions can be expanded by strengthening farmers' institutions through the assistance of farmer groups. There is a need for contractual choice in all macro, meso, and micro institutional devices in the political, social, economic, and legal fields to establish production, exchange, and distribution activities (Guidebook, 2008). This means that market openness must have the recognition of property rights and the institutional side needs the presence of non-market institutional. The role of PIHC and non-market institutions (government and related stakeholders) will be able to support the macro, meso, and micro through collective action. Hardin (1971) and Ostrom (2010) view that collective action is based on a win win solution outcome. This means that the recognition of non-market
institutions and PIHCs on openness (in this context openness to the fertilizer industry) and the presence of non-market institutions provide benefits to both players, namely the fertilizer industry and farmers. The fertilizer industry is guaranteed contractual commitment through the state to develop openness (fertilizer price according to market price and profit margin based on total revenue) while farmers get protection from the state through non-market institutions (in the form of subsidies, price certainty, certainty of fertilizer quantity and fertilizer quality). In the context of the convict dilemma game, entrepreneurs and farmers both obtain optimal pay-offs. This is a combination of institutional policies that have a positive impact on both players.

To improve the combination of these two policies, the presence of the state from the fiscal side is very necessary as a Keynesian instrument (Damanhuri, 2010). The state's contribution is a mandatory investment in the agricultural sector, namely infrastructure (roads and irrigation), electricity, human resources, education and research and development. This investment is a short, medium and long term instrument to strengthen the competitiveness of the agricultural sector. Investment policy in many cases will encourage sustainable economic growth in the agricultural sector and strengthen the national economy.

Conclusion
The cause of transaction costs is the determination and distribution of subsidized fertilizer, bounded rationality, asymmetric information, complex institutional hierarchy, incomplete contractual and procedural errors in determining RDKK prospective recipients of subsidized fertilizer between principle and agent. The trigger is due to the unclear rules of the game and the involvement of actors as well as the complex institutional hierarchy. Price dualism also affects costs.

The largest transaction costs occur at the macro level (gas raw material companies) and distributors. The potential estimated transaction costs at the company level during 2017-2020 is around Rp 20.4 trillion while the potential transaction costs in 2021 are around Rp 3.4 trillion. This causes farmers to have to pay subsidized fertilizer in excess of HET.

The government encourages market openness at the macro level but presents non-market institutions at the meso and micro levels. Expand the role of non-market institutions by strengthening farmers 'institutions through the assistance of farmers' groups. Furthermore, the government pushed the fertilizer price policy to 1 price (no price dualism) and direct subsidy. Price dualism also affects costs. Direct subsidies through farmers' cards are used as a means of payment for subsidized fertilizers. The government needs to divert some of the subsidies through investment.

References


