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Research Report

Effects of High Food Prices on Non-Cash Food Subsidies (BPNT) in Indonesia - Case Study in East Nusa Tenggara

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Policy Paper No. 26

Effects of High Food Prices on Non-Cash Food Subsidies (BPNT) in Indonesia

Case Study in East Nusa Tenggara

by Assyifa Szami Ilman

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EXECUTIVE SUMMARY

Poor Indonesian households spend most of their monthly income on food (62.72%) (BPS, 2016). Their average food consumption is dominated by rice (62.14%) and lacks protein, legumes, fruits and vegetables, which are needed for a nutritional diet (BKP Kementan RI, 2018).

High food prices contribute to the inability to purchase more nutritious food in Indonesia. They also reduce the effectiveness of the Non-Cash Food Subsidy (BPNT) program, which aims to increase nutritious food intake through a grant to purchase rice and eggs. Vegetables, legumes and fruit were added to the program in 2020. In 2019, BPNT kiosks (e-warong) in Kupang, East Nusa Tenggara purchased their rice and eggs from wholesalers in Makassar and Surabaya, making the prices dependent on those charged in these cities.

An experimental simulation by CIPS conducted with women on Sumba Island found that:

- price increases led to lower food purchases and a fall in monthly household consumption by 1.78 kilogram of rice and 3.73 eggs;
- the BPNT program increased average household rice and egg consumption by 21.4 kilogram and 33.79 eggs, respectively.
- when the BPNT program met with a price increase scenario, egg consumption fell by 1.2 eggs per person while rice consumption increased by another 1.46 kilogram compared to the consumption before the price change. Price spikes made households sacrifice protein intake.

Positive nutritional effects of the BPNT program are being reduced by high rice and egg prices in Indonesia. The government should complement the BPNT program with policy reforms that reduce food prices in the country. Price interventions have not kept prices within the set range for these food commodities. Instead, Bulog's medium-quality rice import monopoly (Presidential Instruction No. 5/2015) and the policy of setting rice import quotas through inter-ministerial coordination meetings (MOT Regulation No. 1/2018) should be reevaluated. Maize imports should also increase, since maize is an important ingredient of chicken feed and affects the price of eggs.

FOOD PRICES AFFECT THE POOR

Indonesian food intake was dominated by rice (62.14%) and lacked in protein, legumes, fruits and vegetables in 2017 (Badan Ketahanan Pangan, Kementerian Pertanian RI, 2017). In spite of this sparse diet, Indonesians dedicated an average of about 51% of their monthly expenditures on food consumption. The rural population spent an even higher proportion (58.66%), but urban populations spent somewhat less (46.70%) (BPS, 2017). Among those at or below the poverty line, who spent less than IDR 500.000 monthly, this figure was 62.72% in 2016.

In the 2018 Global Food Security Index, Indonesia ranked 68th out of 113 countries in terms of food consumption as a share of household expenditure. The index also highlighted Indonesia's poor achievement in diet diversity, for which it ranked 102nd out of 113 countries. These rankings highlighted the extent to which Indonesians, especially those living in poverty, spent a high proportion of their income on often inadequate food consumption. This left them with less income for education and other expenses.

Malnutrition is defined as an imbalance in a person's intake of energy and/or nutrients (WHO, 2018) and is influenced by food intake. This matters as many Indonesians suffer from stunting and being underweight (30.8% and 17.7%, respectively), while adult obesity rose from 14.8% (2013) to 21.8% of the population in 2018 (Kementerian Kesehatan RI, 2018).

The government has implemented numerous policies to respond to these challenges. The Non-Cash Food Subsidy (*Bantuan Pangan Non-Tunai*/BPNT) program aims to reduce food expenses through subsidizing specific food choices. It aims to be more targeted to reach the poor population than previous food programs. This program provides monthly transfers of IDR 110,000 through debit cards to beneficiary families (*Keluarga Penerima Manfaat*/KPM). It aims at the 25% poorest families in Indonesia and the transfers can be spent on food bundles of rice and eggs in official distribution kiosks called e-warong. Food available at the e-warong is purchased from various suppliers at various levels of quality and sold at market prices.

“The Non-Cash Food Subsidy (*Bantuan Pangan Non-Tunai*/BPNT) program aims to reduce food expenses through subsidizing specific food choices.”

BPNT POLICY DESIGN

BPNT has been initiated by the Ministry of Social Affairs in cooperation with other government agencies under Presidential Regulation No. 63/2017. The program aims to achieve following objectives:

- (i) reduce the recipients' food expenditures by partially fulfilling their food needs,
- (ii) improve nutrition intake,
- (iii) improve the accuracy of targeting poor recipients,
- (iv) provide options for recipients to control their food needs, and
- (v) help achieve Sustainable Development Goals.

Funds are transferred through a bank account selected by and registered to the representative of the beneficiary family, or KPM (*Keluarga Penerima Manfaat*). To be classified as a KPM, a family must be among the poorest 25% in the region. Each month, IDR 110,000 is transferred to this registered bank account and can be exchanged for rice and eggs in selected e-warong. E-warong are run by government-appointed merchants with pre-existing networks of suppliers who are not only dedicated to this program but sell rice and eggs to anyone.

BPNT is integrated with the government programs, PKH¹ and KUBE². In order to qualify as beneficiaries, families should be registered as PKH recipients first. People involved in managing an e-warong must also be PKH recipients. KUBE business units can attain the status of an e-warong but e-warong can also be managed by minimarkets and other private players.

E-warongs can be flexible in the composition of the egg and rice bundles they sell, and they can use the grant for multiple transactions to purchase rice and eggs on different days. However, there are no restrictions on e-warongs that prefer selling fixed bundles. Fixed bundles restrict the ability of families to purchase food according to their needs. They can search for other e-warong offering the proportion of eggs and rice they prefer. E-warong are also allowed to adjust their prices and the quality of the commodities they offer in response to changes in commodity prices and to cover logistics costs. However, the BPNT policy framework requires e-warong to charge market prices and setting their prices too high will potentially lead to a loss in customers.

E-warong also have the freedom to plan and adjust their monthly stock procurements in response to market demand. While they must sell rice and eggs to BPNT beneficiaries, they are also allowed to sell other commodities, excluding cigarettes and phone credits (pulsa). In fact, the Ministry of Social Affairs encourages e-warong to carry additional products, a practice aligned with KUBE's vision of improving entrepreneurial skills and profit margins.

¹ PKH (*Program Keluarga Harapan*) is a conditional cash transfer program that covers household needs such as education and health.

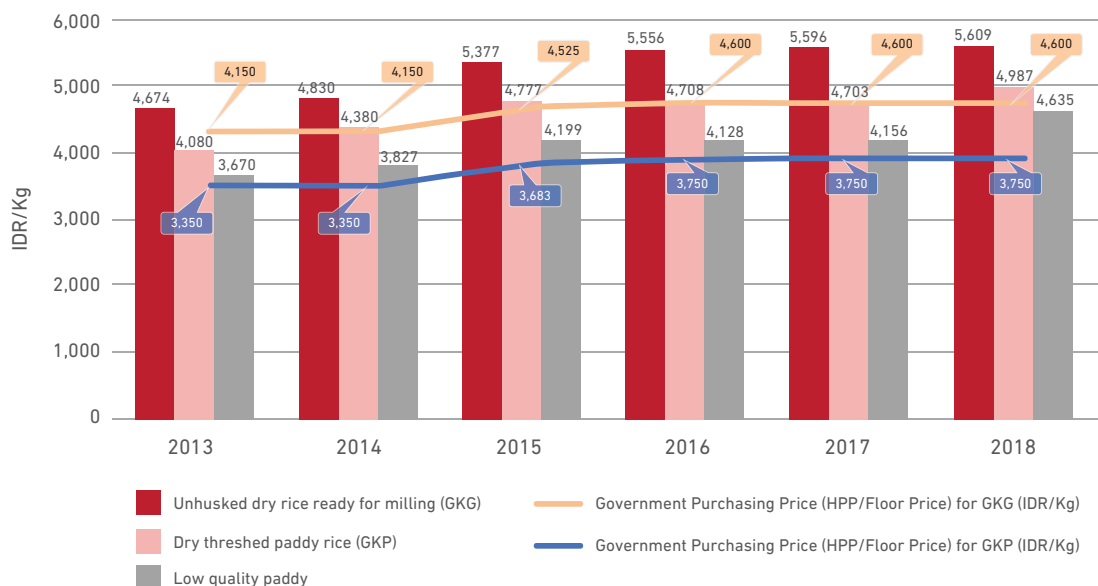
² KUBE (*Kelompok Usaha Bersama*) focuses on improving incomes of the poor by giving them an initial capital to build a productive economic unit that is designed to be their future source of income. The program usually involves a group of 10 people who manage a business unit supervised by government officials.

Offering more products also allows e-warong to operate continuously and not only during KPM grant disbursement. There are no official limits on how much profit can be made by e-warong (interview with ET - Government official from Ministry of Social Affairs, 2019).

Since e-warong are compelled to charge market prices for rice and eggs, it is important to highlight how regulations have affected the prices of these commodities. Prices for rice are regulated under MOT Regulation No. 57/2017, which sets a price ceiling for rice, and Presidential Instruction No. 5/2015, which concerns rice procurement. The former regulation mandates that all rice sellers, including e-warong, comply with the regulated rice price ceiling, which is set between IDR 9,450–10,250/kilogram for medium quality rice and IDR 12,800– 13,600/kilogram for premium quality rice, depending on the region.

Presidential Instruction No. 5/2015 forces BULOG (*Badan Urusan Logistik*, the Indonesian State Logistic Corporation responsible for rice distribution) to procure dry threshed paddy rice (*Gabah Kering Panen/GKP*) and dry unhusked rice ready for milling (*Gabah Kering Giling/GKG*) for IDR 3,700/kilogram and IDR 4,600/kilogram respectively, with a flexibility of 10%. These are not competitive market prices, as shown in Figure 1. This regulation affects e-warong that purchase their rice from Bulog. Several beneficiary families have complained to e-warong that the quality of rice from Bulog is not as good as when it comes from other suppliers. Those who are unsatisfied with the rice quality from one kiosk will likely to go to another, so e-warongs that continue to buy rice from Bulog face the risk of losing customers if the quality does not improve.

Figure 1.
Paddy and Rice Price Levels, 2013–2018



Sources: Statistics Indonesia (2018)

In early July 2019, the the Minister of Social Affairs, assigned Bulog to become the main supplier for rice in the BPNT program because Bulog was facing excess rice inventories in its warehouses. Prior to this announcement, Bulog provided only 47% of the rice distributed through the BPNT program, and the remaining 53% were provided by private distributors. Under the new scheme, the Minister of Social Affairs granted Bulog the capacity to distribute up to 70% of the program's rice (Jakarta Post, 2019).

Following the Coordinating Minister of Economic Affairs Regulation No. 5/2018, Bulog is allowed to purchase rice from farmers at market prices, with losses caused by the difference between selling and purchasing prices covered by the government. This created an opportunity for Bulog to provide better quality rice. Still, Bulog needs to compete with mostly private distributors in the BPNT program to supply good quality rice.

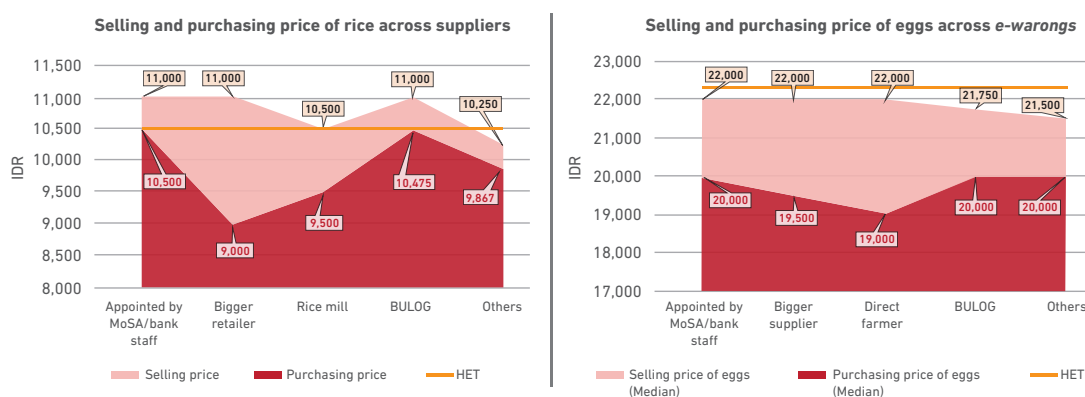
Meanwhile, egg prices are regulated under MOT Regulation No. 96/2018, which mandates price levels for Bulog and other state-owned enterprises. Distributors/agents trading in eggs should refer to the price setting for consumers. The farmgate prices are set at 18,000–20,000 IDR/kilogram and the consumer price at IDR 23,000/kilogram. These levels were changed in early 2019 by MOT Circular Letter No. 82/2019, which increased the farmgate price to IDR 20,000–22,000/kilogram and the consumer price to IDR 25,000/kilogram. These changes were temporary and applied only from January–March 2019. In early July 2019, the Ministry of Trade indicated that prices may be adjusted again, saying that MOT Regulation No. 96/2018 would further be evaluated. Farmers urged the government to increase the farmgate price to 19,950–22,050 IDR/kilogram. In response, the Ministry of Trade announced it would coordinate a review with the Ministry of Agriculture.

BPNT ANALYSIS

Just as important as the design of the BPNT program is the way in which it is being implemented. This study observed 8 out of 20 e-warong in Kupang, East Nusa Tenggara^{3,4} to understand the challenges that occur in the program and to compare these findings to previous studies. The e-warong observed were E-Warong KUBE Edelweis, E-Warong KUBE Teratai, E-Warong KUBE Bonsai, E-Warong KUBE Sehati, E-Warong KUBE Kelapa, E-Warong KUBE Abadi, E-Warong KUBE Beringin, and E-Warong KUBE Tulidei. These e-warong were chosen randomly.

On average, interviewed e-warong served approximately 300 beneficiary families (KPM). Most e-warong obtained their rice and eggs from private suppliers at prices ranging from IDR 385,000 to IDR 420,000 for 50 kilograms of rice and IDR 50,000 to IDR 60,000 for a rack of 60 eggs. All rice and egg supplies came from Pasar Inpres Naikoten I, the largest marketplace in the city. Only one e-warong bought its inventory from both private suppliers and Bulog. This is in line with a study of MicroSave Consulting (MSC, 2019), which suggested that e-warong earn higher profit margins when they purchase rice from other suppliers than Bulog (Figure 2).

Figure 2.
Profit margins of E-Warong, 2018



Sources: MicroSave Consulting, 2019

³ We Further information is available in the Appendix

⁴ This study was conducted in the province's capital Kupang, which was the only region in East Nusa Tenggara province that fully implemented the BPNT program, although other regions in East Nusa Tenggara participated in an earlier version of the program (BPNT-Rastra).

Each KUBE unit comprises of 7–10 members and women, specifically mothers registered with PKH, are the dominant participants. All e-warong observed were established with the support of capital invested by the Ministry of Social Affairs ranging from IDR 3–5 million. KUBE members have to provide the land (which must be owned by one of the members), and they must procure the goods for the store. There are two banks that support BPNT in Kupang, namely Bank Rakyat Indonesia and Bank NTT. These banks provide an Electronic Data Capture (EDC) machine, which is a payment terminal used by the merchants to receive card payments and also instructions how KUBE members can use the machine.⁵

E-warong managers and beneficiary families confirmed in interviews that BPNT is generally regarded much better than the previous Rastra program. While Rastra distributed more rice (10 kilogram) consistently every month through a local village office, BPNT provides not only rice but also eggs. The Rastra implementation in Kupang faced delivery delays and some recipients accumulated their allowances of up to three months. Furthermore, some villages decided to distribute the rice to local community (RT) leaders so that recipients would not have to travel far to collect their rice allowance. However, this practice was problematic. In several cases, RT leaders decided to distribute the rice evenly to all citizens to prevent jealousy rather than to only the neediest families. This reduced the volume of rice for targeted recipients.

The problems with Rastra have been minimized by distributing grants directly to beneficiary families (KPM) and by allowing them to use any e-warong under BPNT. However, in the early phase of BPNT, some KPM complained about receiving smaller quantities of rice because under the new program they may only receive up to 9 kilograms but e-warong KUBE members were able to offer better quality rice and eggs than under the old program.

Of eight observed e-warong, six applied a fixed bundling policy. Three exchanged the monthly grant of IDR 110,000 for 8 kilogram of rice and 7 eggs. Over time, they adjusted the bundles according to their purchasing and stockpiling needs. The other three offered 9 kilogram of rice and 5 eggs. These e-warong set their rice price at IDR 11,000–11,500/kilogram and charged IDR 2,000 per egg⁷. Two e-warong did not offer fixed bundles and instead allowed the KPM to determine the quantities of rice and eggs they want to buy with their grant. While fixed bundling may hinder the beneficiaries' purchasing flexibility, this business model provides better options for packaging and prevents queuing (TNP2K, 2018; MSC, 2019).

Some e-warong sell other products, such as household goods, snacks, biscuits, and the nine basic food commodities considered essential in Indonesia (*sembako*). Selling those provided a profit but interviews with e-warong members revealed that they did not generate a profit selling BPNT goods. A national study found that e-warong managed by KUBE only generated an average monthly income of around IDR 1,300,000. (MSC, 2019) Once divided among ten members, this yields too small an income for a member to be fully engaged. Respondents for this study stated that those managing e-warong perform volunteer activities rather than working to generate income.

⁵ The study failed to find e-warong KUBE members or KUBE treasurers able to provide precise data about their financial performance. Interviewees did not provide phone numbers of their treasurers, leaders, or government officials who acted as supervisors. This made it impossible to calculate profits/losses for each e-warong.

⁶ *Rukun Tetangga*, a neighborhood consisting of 20 – 40 houses.

⁷ This number observed has already been adjusted with applied local price levels.

Since they do not provide a significant source of income for all members, most e-warong in Kupang open only from the 15th to the end of the month. The dates on which e-warong open are not regulated, but beneficiary families usually redeem their grants to replenish their rice and egg stocks at the end of the month. All observed e-warong close their stores on the remaining days and are in operation for 15 working days plus one or two additional days to procure rice and egg inventories from suppliers.

Although e-warong use different suppliers, they are mostly located in the Pasar Inpres Naikoten I marketplace and they purchase from only four rice and two eggs wholesalers in Makassar and Surabaya, respectively. These players tend to charge the same price, so rice and eggs price changes in Kupang are determined by price changes in Makassar and Surabaya as well as by differences in their delivery to the customers. Table 1 presents a simple comparison of the intentions of BPNT regulations and the reality of BPNT in Kupang. Further explanations of BPNT can be found in the appendix.

Table 1.
Comparison Table between Regulation and Findings

INDICATORS	REGULATION	FINDINGS IN KUPANG
PURPOSE OF E-WARONG KUBE	To hone entrepreneurial skills of the KUBE members and generate profit	Deemed as a voluntary activity, not all registered KUBE members are actively involved in managing e-warong.
COMMODITIES FOR SALE	Selling commodities beyond eggs and rice is encouraged (excluding cigarettes and phone credit)	Some e-warong sell other products aside from rice and eggs
HOURS OF OPERATION	E-warongs open regularly, not only during BPNT disbursement	All e-warong observed open only from 15th to the end of the month
GOODS BUNDLING	BPNT encourages flexibility that responds to the beneficiaries' preferences for rice and eggs.	Of eight observed e-warong, six applied a fixed bundling policy to ease technical problems.
GRANT DISBURSEMENT	Beneficiaries can make multiple transactions when using the government-provided cash deposit card (Family Welfare Card/KKS)	Most beneficiaries spend their grant in a one-time transaction. There is no prohibition or encouragement from e-warong in terms of ideal time of disbursement.
SUPPLIER	The government may recommend suppliers to the KUBE but they are free to choose other suppliers	Most of the KUBE in Kupang chose to engage with private suppliers of rice and eggs. Only one e-warong purchased and sold rice from Bulog.
PRICING	Sales prices are set by e-warong according to market prices	Sales prices are set by e-warong according to market prices
BANKS SUPPORTING BPNT	HIMBARA (Association of State-Owned Banks)	BRI and Bank NTT

Source: Author's Documentations, Presidential Regulation 63/2017, TNP2K (2017), and Interview with MOSA Official (2019)

In order to explore the effects of BPNT on participating households' monthly food expenses, sample households on Sumba Island were selected to measure their initial household spending on rice and eggs. An average household had approximately seven family members⁸. The observed prices in Sumba markets were IDR 12,000/kilogram for rice and IDR 2,000 per egg⁹. Average monthly household spending on rice was IDR 635,027, allowing for the consumption of about 52.9 kilogram per month. Average monthly household spending on eggs was IDR 90,162, which bought about 45 eggs (around 2.7 kilogram of eggs¹⁰). On average, each family member consumed about 7.6 kilogram of rice and 6 eggs per month, compared to the official statistics for national average consumption of 9.55 kilogram of rice and 11 eggs per capita per month (Ministry of Agriculture, 2018).

The BPNT grant of IDR 110,000 covers about 15.16% of the average monthly household spending. Assuming similar proportions were dedicated to rice and eggs, the BPNT may increase household consumption of rice by as much as IDR 96,323.79, or around 8 kilogram, and increase consumption of eggs by as much as IDR 13,676.21, or around 7 eggs, which equals an additional 1.15 kilogram of rice and 1 egg per household member per month. However, some households may not have chosen to buy additional rice and eggs but, instead, spent the household budget that had originally been earmarked for rice and eggs, on other needs or commodities.

⁸ More details about this sample can be found in the Appendix.

⁹ Sumbanese wholesalers sold eggs and chicken by the units and not by weight. While this practice is illegal (JPNN.com, 2019 ; Prokal.co, 2019), it has been widely accepted not only on Sumba Island but also in Kupang and several other regions in Indonesia.

¹⁰ Assuming 1 kilogram of eggs consists of 16 eggs, according to the European Egg Size Standard (Medium Size: 63 gr).

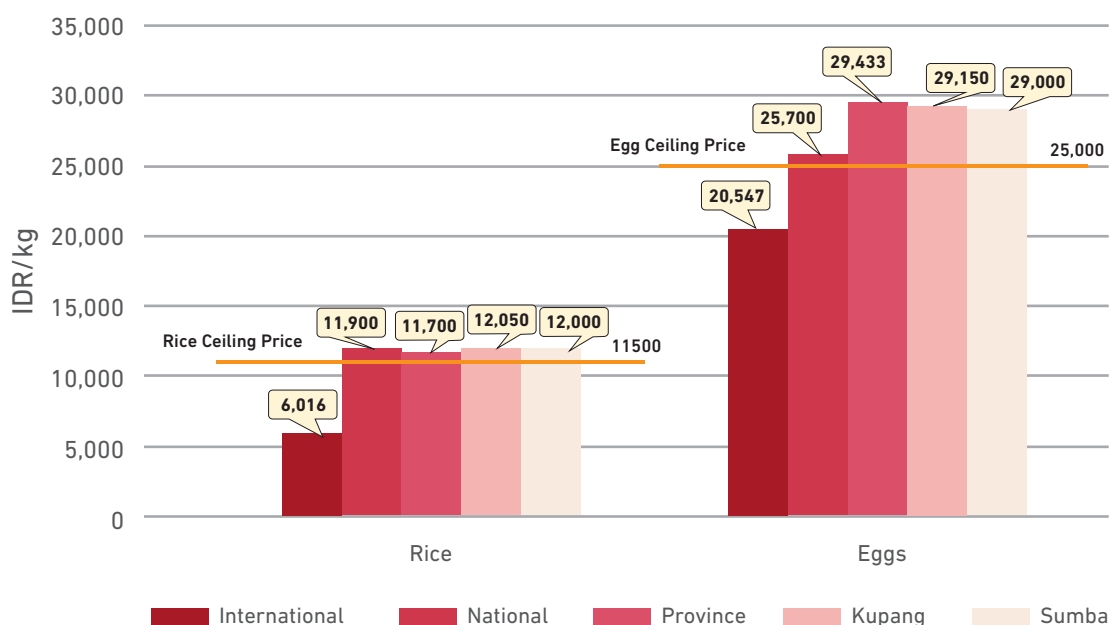
HOUSEHOLD RESPONSE TO FOOD PRICE CHANGES

As BPNT applies market prices for rice and eggs, it is important to measure how food prices affect the BPNT program. Understanding this relationship can help BPNT achieve its goal of partially substituting poor households' food expenses. For this purpose, experimental studies were conducted in West Sumba and Southwest Sumba districts, both located in East Nusa Tenggara (NTT), which is one of the poorest provinces in Indonesia. The BPNT program has not been introduced in these two districts yet.

Stunting prevalence in NTT is considered the worst in Indonesia, affecting 42,6% of the population along with other symptoms of malnutrition. West Sumba and Southwest Sumba districts are among the most food insecure regions in NTT (World Food Program, 2015) and they are priority regions for the reduction of stunting in Indonesia.

Rice and egg prices in the districts are higher than the national average and the international price, and only slightly below the province's capital Kupang, further contributing to the lack of affordability of both commodities. Figure 3 compares the prices of rice and eggs in January 2019. Note that the national prices for rice and eggs are far above international prices, while the local prices are above the regulated price ceilings of IDR 9,450–10,250/kilogram for medium-quality rice and IDR 25,000/kilogram for eggs.

Figure 3.
Rice and Eggs Price Comparisons



Source: World Bank Commodity Price (Pink Sheet) January 2019 and Bank Indonesia (PIHPS)

In order to assess the effects of food prices on consumption behavior, 38 mothers from five villages in the targeted districts participated in an experimental study.¹¹ The questionnaire was based on market prices for twelve commodities: rice, chicken meat, beef, corn, shallots, garlic, chilies, sugar, noodles, cigarettes, cooking oil, and eggs.^{12,13}

“Overall, the subjects responded to increased food prices by decreasing consumption.”

Overall, the subjects responded to increased food prices by decreasing consumption. Simulated increases in rice and egg prices decreased the average consumption by 1.78 kilogram of rice and 3.73 eggs. However, similar price changes for other protein-rich foods reduced the average consumption by 2.99 eggs and increased average rice consumption by 1.17 kilogram. The introduction of the BPNT program increased consumption of rice and eggs by 21.4 kilogram of rice and 33.79 eggs across the sample every month. However, this changed when rice prices were also increased. As a result, eggs consumption decreased by 1.2 eggs while 0.2 kilogram more rice was consumed. To sum this up, the BPNT program leads to an increased intake of rice and eggs but increased food prices result in households prioritizing rice over eggs, reducing the intake of important nutrients.

“the BPNT program leads to an increased intake of rice and eggs but increased food prices result in households prioritizing rice over eggs, reducing the intake of important nutrients.”

¹¹ While 56 mothers were willing to participate, only 38 were eligible, due to barriers such as illiteracy and failure to understand the survey instructions. Methodological explanations have been added in the Appendix.

¹² Cigarettes are considered food commodities according to Statistics Indonesia. The ingredients of the food bundle were chosen according to their importance for the community, shown by the highest amount of money spent on each commodity.

¹³ This study removes beef from our observation as we found only one respondent consistently buying beef, which would skew the results in such a small sample. Based on interviews we determined that this is the result of cultural practices—people in Sumba expect to receive beef each month through folk events in the community. However, because the question remained in the surveys, it is possible that hypothetical changes in the price of beef affected reported spending decisions.

A. The Impact of Food Price Changes on Consumer Spending

Table 2 compares the sample mean difference between pre-intervention and post-intervention spending after the prices of rice and eggs were increased by IDR 500.¹⁴

Table 2.
Changes in Expenditures with Price Increases for Rice and Eggs

Consumer Spending	Rice (kg)	Chicken (unit)	Corn (kg)	Shallots (kg)	Garlic (kg)	Chilies (bowl)	Sugar (kg)	Instant Noodles (pack)	Cigarettes (pack)	Cooking Oil (l)	Eggs (unit)
Before	11.89	1.14	3.00	0.91	0.80	1.20	1.61	4.54	1.83	0.99	12.43
Consumer (n)	33	7	8	30	26	27	33	12	6	28	23
After	10.10	1.00	2.86	0.87	0.87	1.19	1.60	6.46	1.83	1.02	8.71
Consumer (n)	33	2	7	30	24	24	30	13	6	28	24
Consumption difference	-1.78	-0.14	-0.14	-0.04	0.07	-0.02	-0.01	1.92	0.00	0.03	-3.73
Consumer difference (n)	0	-5	-1	0	-2	-3	-3	1	0	0	1

Source: Author's calculation

Increasing rice and eggs prices led to decreasing average consumption levels of both commodities, but also affected the consumption of other commodities. The consumption of garlicks and instant noodles increased together with the prices of rice and eggs. Chicken consumption decreased most, followed by chilies, sugar, garlicks, and corn. Rice and egg price increases affected the household's entire consumption and nutrition bundle.

Another scenario consisted of increased prices for protein foods — additional IDR 22,000 for a chicken, IDR 3,000 per kilogram of beef, and IDR 500 for an egg.¹⁵ Figure 3 shows the result of this intervention.

Table 3.
Changes in Expenditures with Price Increases for Chicken and Eggs

Consumer Spending	Rice (kg)	Chicken (unit)	Corn (kg)	Shallots (kg)	Garlic (kg)	Chilies (bowl)	Sugar (kg)	Instant Noodles (pack)	Cigarettes (pack)	Cooking Oil (l)	Eggs (unit)
Before	11.89	1.14	3.00	0.91	0.80	1.20	1.61	4.54	1.83	0.99	12.43
Consumer (n)	33	7	8	30	26	27	33	12	6	28	23
After	13.60	1.00	3.21	0.91	0.97	1.24	1.65	5.53	2.33	1.17	9.44
Consumer (n)	33	9	14	27	23	21	26	15	3	23	18
Consumption difference	1.71	-0.14	0.21	0.00	0.17	0.03	0.05	0.99	0.50	0.18	-2.99
Consumer difference (n)	0	2	6	-3	-3	-6	-7	3	-3	-5	-5

Source: Author's calculation

¹⁴ This change is based on the real observed world price change in the previous year.

¹⁵ These experimental increases are based on the observed price hikes during the previous year.

Rising chicken, beef, and egg prices influenced the consumption levels of these commodities and also the number of respondents who indicated they would continue to purchase them. Chicken consumption decreased on average by 0.14 units, but two additional respondents decided to purchase chicken. It appeared that an increase in these protein food prices increased the number of households consuming chicken at the expense of other commodities—demand for sugar, cooking oil, chilies, garlicks, shallots, and cigarettes decreased in response to the price shock.¹⁶ Five consumers did no longer purchase eggs and average household consumption decreased by almost 3 eggs. Interestingly, respondents reported that they would purchase more instant noodles.

Overall, increased rice, egg, beef, and chicken prices should be expected to affect the entire consumption bundle. As prices rise, the consumption of sugar, chilies, cooking oil, and eggs falls most, followed by garlicks and shallots. Both, the average consumption levels and the number of consumers of these commodities decreased. Instant noodle consumption increased as they are often taken as a substitute for rice, but they contain less protein and more fat than rice (Park et al., 2011).

¹⁶ The reduction in cigarette consumption is assumed to be influenced by the fact that respondents were mothers, while fathers were more likely to prioritize cigarette consumption. This assumption is supported by mothers' indication that they consider cigarettes very expensive and less important for their daily lives, as shown in the next section.

B. Effects of Food Prices on BPNT

The Indonesian government, through BPNT, provides a non-cash grant to low-income households each month that can be exchanged for rice and eggs. E-warong are free to charge market prices that generally exceed general price ceilings set by the Indonesian government (Figure 3). These high food prices can affect the ability of BPNT to improve the food consumption of poor families.

The experimental study conducted for this paper simulated how respondents would change their future consumption after receiving a BPNT grant once the program gets introduced in their districts. It also estimated how price changes would affect their consumption of rice, eggs and other food commodities not covered by the grant.

Table 4.
Changes in Expenditures with BPNT Simulation

Consumer Spending	BPNT Rice (kg)	BPNT Eggs (unit)	Rice (kg)	Chicken (unit)	Corn (kg)	Shallots (kg)	Garlic (kg)	Chilies (bowl)	Sugar (kg)	Instant Noodles (pack)	Cigarettes (pack)	Cooking Oil (l)	Eggs (unit)
Before			11.89	1.14	3.00	0.91	0.80	1.20	1.61	4.54	1.83	0.99	12.43
Consumers			33	7	8	30	26	27	33	12	6	28	23
After	6.18	13.57	15.21	1.00	4.14	1.06	0.85	1.33	1.53	4.00	1.67	1.13	20.22
Consumers	37	37	18	9	14	28	23	21	25	12	3	28	9
Consumption difference	6.18	13.57	3.32	-0.14	1.14	0.15	0.04	0.13	-0.07	-0.54	-0.17	0.14	7.79
Consumer difference			-15	2	6	-2	-3	-6	-8	0	-3	0	-14

Source: Author's calculation

Recipients bought on average 6 kilogram of rice and around 13 eggs per household per month (Table 4) using the simulated BPNT grant. They allocated most of their freed-up resources to purchase more corn. This may be influenced by the local culture and cannot be seen as a national preference, since in Sumba and East Nusa Tenggara the consumption of corn is more popular than in the rest of the country.

BPNT significantly reduced the burden of purchasing rice and eggs. 15 respondents stopped purchasing rice and 14 stopped buying eggs from their personal income. Those who still purchased both commodities increased their consumption by around 3 kilogram of rice and five additional eggs to an average of about 21.4 kilogram of rice and 33.79 eggs every month.

Those who still purchased both commodities increased their consumption by around 3 kilogram of rice and five additional eggs to an average of about 21.4 kilogram of rice and 33.79 eggs every month.

These allocations change with food prices. Table 5 shows the expected impact of an increase of IDR 500 in the rice price per kilogram as well as per egg under a simulated BPNT grant scenario.

Table 5.
Changes in Expenditures with Food Price Increase and BPNT Simulation

Consumer Spending	BPNT Rice (kg)	BPNT Eggs (unit)	Rice (kg)	Chicken (unit)	Corn (kg)	Shallots (kg)	Garlic (kg)	Chilies (bowl)	Sugar (kg)	Instant Noodles (pack)	Cigarettes (pack)	Cooking Oil (l)	Eggs (unit)
Before	6.18	13.56	15.21	1.00	4.14	1.06	0.85	1.33	1.53	4.00	1.67	1.13	20.22
Consumers	37	37	18	9	14	28	23	21	25	12	3	28	9
After	7.64	10.63	14.61	1.09	8.60	10.67	0.98	1.32	1.60	4.67	2.33	1.03	15.78
Consumers	37	37	15	10	10	27	21	17	29	11	3	22	9
Consumption difference	1.46	-2.93	-0.60	0.08	4.5	9.6	0.13	-0.01	0.06	0.67	0.67	-0.10	-4.44
Consumer difference	0	0	-3	1	-4	-1	-2	-4	4	-1	0	-6	0

Source: Author's Calculation

Responding to the price increases, the consumers now used the BPNT grant to buy on average 1.46 kilogram more rice and 3 eggs less than before the price increase.

The simulated price increases reduced the amount of rice and eggs that could be purchased with a BPNT grant worth IDR 110,000. The experimental study showed a shift in consumption. Responding to the price increases, the consumers now used the BPNT grant to buy on average 1.46 kilogram more rice and 3 eggs less than before the price increase. Additional purchases of rice from their own personal income reduced only slightly after the price increase (-0.6 kilogram) but 4.44 less eggs were purchased. Using funds from the BPNT grant subsidy and additional personal income, the price increases caused the total monthly rice consumption to rise from 21.39 to 22.25 kilogram and overall monthly egg consumption fell from 33.78 to 26.41 eggs.

As in earlier simulations, facing an increase of food prices, households prioritize consuming rice over eggs. This suggests that price increases for rice and eggs reduce the ability of BPNT to increase both rice and egg consumption and to facilitate a more diverse nutrition intake among poorest families.

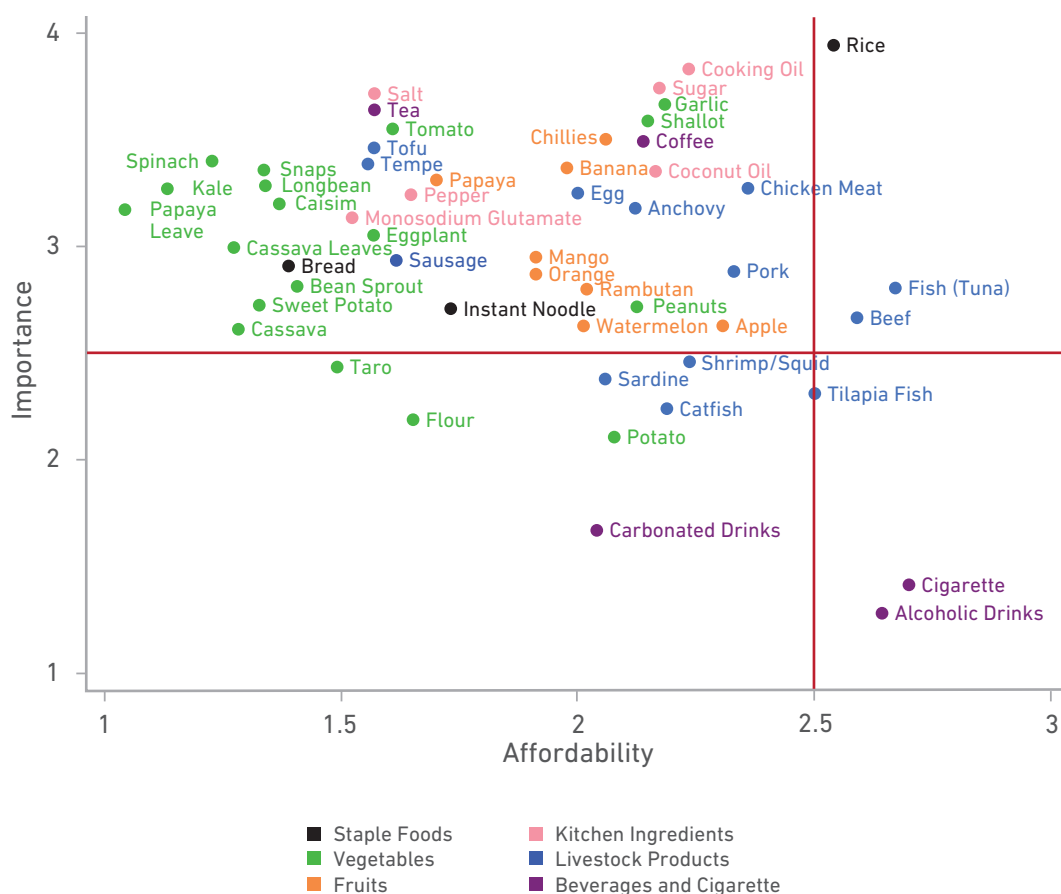
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FOOD IMPORTANCE AND AFFORDABILITY

While the BPNT grant partially substitutes monthly household expenditures and allows for an increase in food consumption, higher food prices reduce the increase in consumption and influence the overall composition of household expenditures. In particular, increases in the price of protein-rich foods can be expected to decrease both the level and diversity of household nutrition intake.

Preferences in Sumba regarding the consumption of rice, eggs, and other commodities need to be taken into consideration. Survey respondents rated the importance of each food commodity and their perception of its affordability. This may point to other commodities that require policy changes.¹⁷

Figure 4.
Food Value Preference Mapping



Source: Author's Calculation

¹⁷ Further explanations are available in the Appendix

Figure 4 categorizes food commodities into four groups: the most important and most expensive shown the upper-right quadrant—this is where policies are needed to bring prices down. This category contains rice, fish (tuna/*tongkol*) and beef. These commodities are also nutrient-rich and can reduce malnutrition in the observed regions.

Commodities seen as important and affordable (upper-left quadrant) are those for which government interventions are less urgent. Most food items fall into this category. Food commodities seen as less important and affordable (bottom-left quadrant) may benefit from increased consumer education if they offer nutrients that are lacking from the general diet, as with seafood. Alcoholic drinks and cigarettes were classified as unimportant and unaffordable (bottom-right quadrant).

POLICY RECOMMENDATIONS

Indonesians face high food prices and spend around half their income on food, more if they are at or below the poverty line. Most of this spending goes toward purchasing rice, resulting in poor nutrition diversity. Policy interventions by the government of Indonesia to lower prices have not yet been successful.

The BPNT program aims to improve nutrition intake with a monthly grant of IDR 110,000 for poor families to purchase rice and eggs at e-warong, official vendors that facilitate these transactions. Because e-warong charge market prices for their goods, the effectiveness of this program is affected by high consumer price levels in Indonesia.

To address this situation, the government should consider the following steps:

1. Maintain the BPNT Program

BPNT as a non-cash social assistance program in Indonesia was created by Presidential Regulation No. 63/2017 and has successfully increased rice and egg consumption of poor families and covers as much as 15.16% of household spending. BPNT has corrected problems related to previous grants that were going to all families instead of only the poorest, and it has improved the grant quality by allowing beneficiaries to choose the rice and eggs they prefer. In 2020, the Ministry of Social Affairs upgraded the BPNT grant from IDR 110,000 to IDR 150,000 per month and customers can not only purchase rice and eggs, but also legumes, vegetables, and fruits. In order to further improve the effectiveness of this program, the government should continue improving its targeting system to really benefit the people who need this scheme the most.

In order to further improve the effectiveness of this program, the government should continue improving its targeting system to really benefit the people who need this scheme the most.

2. Reform food policies

High food prices influence the performance of BPNT and they affect spending decisions by poor household with a higher propensity to suffer from malnutrition. Survey data suggest that in Sumba Island, an exceptionally food-insecure region, an increase in the prices of rice and protein-rich foods can be expected to result in a decrease in protein-rich food consumption, a reduction in nutrition diversity, and a shift toward consuming additional rice and instant noodles. Due to these changes in consumption behavior, the effectiveness of the BPNT program decreases with rising prices for rice and eggs. A cross countries study by Holmes and Bhuvanendra had already stated in 2013 that high food prices reduced the value of cash transfers.

Government efforts to lower food prices have not yet been successful. Presidential Instruction No. 5/2015 and MOT Regulation No. 57/2017 intervene in rice prices and MOT Regulation No. 96/2018 regulates the price of eggs. They set ceiling prices at the farm gate and for consumers in order to keep these goods affordable. However, prices have grown above these ceilings and are much higher than on the international market. Therefore, the government should shift the policy focus, from attempts to directly intervene in prices to policies that ease market access for cheaper goods.

The government should shift the policy focus, from attempts to directly intervene in prices to policies that ease market access for cheaper goods.

In order to lower the price of rice, the government should relax heavy import restrictions. This will be a short-term solution that lowers prices and eventually lead to better nutrition intake (Kuncoro et al., 2019). In particular, the government needs to review the monopoly import rights for Bulog, as stipulated in Presidential Instruction No. 5/2015, and import quota set by inter-ministerial coordination meetings, as stipulated in MOT Regulation No. 1/2018 (Respatiadi and Nabila, 2017).

In order to reduce the price of eggs, the government should consider its policies affecting the maize industry. Maize is a key ingredient in chicken feed and maize prices are responsible for 50–60% of the cost of poultry production, which eventually affect egg prices. Affordable maize prices will not only lower egg prices but also help consumers in regions like Sumba and other regions of Eastern Indonesia in which maize is a staple food. In order to achieve lower prices, bureaucratic procedures need to be reduced in order to ease the process of importing maize. Further reforms need to address import restrictions set by MOA Regulation No. 57/2015 and MOT Regulation No. 21/2018 (Ferlito and Respatiadi, 2018; Freddy et al., 2018).

APPENDIX

A1. METHODOLOGY

In order to understand how prices affect purchasing decisions and how BPNT has affected food consumption, we first measured what proportion of monthly household food needs are covered by the BPNT grant via a survey gathering data on subjects' socioeconomic background and food consumption data (i.e., monetary spending on and consumption quantity of) for rice and eggs. Taking national average household monthly spending based on MSC (2019), we estimated how much food spending is covered by BPNT. We also estimated average household consumption of rice and eggs from our sample and the quantity of eggs and rice the BPNT grant may cover. In doing the latter part, we assume the food price equals the price observed at the study site (Sumba Island).

An experimental survey was used to measure changes in food consumption resulting from price changes. This study will refer to the review on experimental research design by Epstein et al. (2012) and apply laboratory experiment within-subject research design. Through this methodology, subjects may participate in multiple sessions, in which each session represents a different condition. This is the design used in experiments in which price changes were manipulated across sessions. Subjects first stated their monthly/weekly/daily spending on food and were later asked to complete questionnaires that simulated shopping available food bundles and prices. The food bundles offered reflect the national socio-economic survey's SUSENAS Food Bundle, but were simplified to only twelve commodities: rice, chicken meat, beef, corn, shallots, garlic, chilies, sugar, noodles, cigarettes¹⁸, cooking oil, and eggs. The prices used in this questionnaire were based on the market prices as observed before the start of the survey. Some commodities in SUSENAS were not easily available in the region (e.g., catfish), and so were excluded. The price changes tested in the simulations varied from the lowest to the highest price level, from which an annual price trend for each commodity was estimated. The scenario that are applied in this experimental research design can be seen on the Table below. The design basically tries to observe the consumption changes that was made by samples when there's an increase in price of food(s). This research design also accommodates conditions where there is BPNT program and where there are no BPNT program applied in order to cover the significance to which this program might help samples in curbing the change in food prices to their consumption level.

Scenario	Commodity (Price Changes – in IDR)
1 (Initial)	Actual Price
2	Rice (+500), Eggs (+500)
3	Chicken (+22000), Beef (+3000), Eggs (+500) Other price back to actual price
4	Actual Price BPNT Simulation Applied
5	Rice (+500), Eggs (+500) BPNT Simulation Applied

¹⁸ Cigarettes are considered food commodities according to Statistics Indonesia. Food bundles consisted of commodities on which communities spent the largest amount of their income, indicating their importance for the community.

A preference value questionnaire was used to further strengthen the study. Respondents were faced with questionnaires with a full list of SUSENAS food commodities and instructed to specify their preference valuation for all commodities. Two aspects were considered: whether a commodity is considered important (1: very unimportant, 2: unimportant, 3: important, 4: very important) and whether a commodity is affordable (1: very expensive, 2: expensive, 3: cheap, 4: very cheap, 0: never buy/know the product). Values from all respondents were then averaged.

Our approach in this study's samples is using purposive sampling, where we aimed to involve only mothers¹⁹ as our samples, as they are the perceived recipients of BPNT and also make the majority of household expenditure decisions in Indonesia (The Asian Parents as cited by Baqiroh and Trihendrawan, 2018). The study (interviews and experiment sessions combined) involved at least 56 mothers from both regions. Each mother underwent an experimental session that lasted approximately one hour, including a 15–20 minute briefing and simulation at the beginning of the session. Mothers were not allowed to eat any food except for water two hours prior to the experiment to avoid influencing food choices (Beneke & Davis, 1985). This was tested by asking each mother about the last time they ate. To ensure that they complied with this request, the experiment was conducted in the late morning or the late afternoon (10AM–12PM or 4PM–6PM).

Finally, in order to determine the influence of food prices, interviews were conducted with several e-warong owners and e-warong suppliers of rice and eggs, as well as with relevant departments under the local government authority in order to enrich the understanding of BPNT and challenges that arise in executing the program.

A2. E-WARONGS IN KUPANG

E-warong were created by a program proposed by the Social Affairs Ministry, empowering recipients of the PKH program to establish a cooperative KUBE (Kelompok Usaha Bersama) to improve entrepreneurial skills and help them to slowly detach themselves from social assistance. During the field research in Kupang from January 15th to 27th, 2019, eight e-warong KUBEs were randomly chosen as subjects for interviews. Among those interviewed, patterns of similarities and dissimilarities emerged that can help explain the effectiveness of the BPNT program.

Five out of eight e-warong KUBEs did not disclose their founder, while the other three, including E-Warong KUBE Edelweis and E-Warong KUBE Tulidei, stated that the initiator was their PKH Companion (Pendamping PKH). E-Warong KUBE Teratai was originally established based on the local leader's decision. All of the e-warong KUBEs comprised 10 members, except for E-Warong KUBE Teratai (7 members) and E-Warong KUBE Beringin (8 members).

The Social Affairs Ministry provided an initial capital investment for each e-warong KUBE to buy food commodities. Only two kiosks specified how much money was provided by the government: E-Warong KUBE Bonsai received IDR 30,000,000 while E-Warong KUBE Beringin claimed to have received IDR 5,000,000. However, E-Warong KUBE Bonsai, E-Warong KUBE Sehati, and E-Warong

¹⁹In this study, the term mother is defined as a woman who already married and still maintain the status by having either a living husband or children. These mothers come from five different villages spread across the two districts. We asked the head of the village to select 10-15 random mothers as our sample.

KUBE Abadi didn't acknowledge the government's role in their startup phase. Four e-warong stated that Bank HIMBARA such as Bank NTT and Bank BRI provided training to operate the electronic data capture (EDC) machines used in the kiosks. In addition, four e-warong mentioned their members contributed land. Three revealed certain barriers to operating: E-Warong KUBE Sehati complained that they didn't generate much profit, which discouraged its members from helping the management. E-Warong KUBE Abadi never entirely sold their commodities due to the lack of beneficiary households (KPM) in their area. E-Warong KUBE Kelapa only operated with two members as others were not interested.

Aside from these barriers, almost all e-warong experienced problems with their supply chains. Two confirmed that price volatility creates problems with bundling modifications (E-Warong KUBE Edelweis) and causing losses (E-Warong KUBE Teratai). Some expressed minor concerns about the tardiness of food distribution and money transferred to the beneficiaries. One e-warong objected to paying the cost of purchasing commodities in advance using their own money.

A3. STUDY SITE: SUMBA

West Sumba

West Sumba has a significant land area of 737 km². In 2016, there were 63 villages and 11 sub-subdistricts (*kelurahan*) in West Sumba. West Sumba had 125,776 inhabitants in 2017. The population is very young, with those aged 0–9 years old accounting for 25.66% of the total population. The agricultural sector dominated the job market in West Sumba (62.55%), followed by services sector (33.08%), and manufacturing sector (4.37%) in 2015.

The poverty rate in West Sumba Regency is relatively high—in 2016, the poverty rate reached 29.34%, around 36,210 people. The smaller the income, the greater the proportion of income allocated to food consumption. The population in West Sumba Regency has average per capita expenses of IDR 623,154 per month, with food expenditures reaching IDR 363.163 (around 58% of total expenses) and IDR 259.971 for non-food expenditures. The largest proportion of spending goes towards rice. In 2018, 40.61% of the population received rice subsidies under the Rastra program, while other government programs reached 33.64% (Prosperous Family Card, Kartu Keluarga Sejahtera/KKS) and 54.79% (Family Hope Program, Program Keluarga Harapan/PKH).

Southwest Sumba

Southwest Sumba is one of the districts in East Nusa Tenggara Province adjacent to West Sumba Regency. The total land area is about 1,445.32 km². There were 175 villages and 11 sub-districts in 2017 and the population was projected to reach 331,894 people in the same year. The young population dominates the composition of the population in Southwest Sumba by 52.76%.

The poverty rate in Southwest Sumba is relatively high. From 2013 onwards, the share of poor people in this area increased and reached 30.13% in 2017. Southwest Sumba Statistics reported that 51.58% of households received Rastra rice subsidies and 35.54% of households were supported through the Family Hope Program (PKH) in 2018. Southwest Sumba has the fifth highest number of malnutrition cases in East Nusa Tenggara Province.

Southwest Sumba relies heavily on the agricultural sector, which makes the biggest contribution to regional GDP. Employment is provided for the working age population of Southwest Sumba in 2017 in the agriculture and mining/quarrying sector (71.30%), the services sector (15.66%), and the manufacturing sector (13.04%). The leading sectors that contribute to Gross Regional Domestic Product (GRDP) are: agriculture, forestry, and fisheries which reached 40.11% in 2017. In 2017, total per capita expenditure in Southwest Sumba Regency was IDR 447,778 per month and 70,27% was used for food consumption. Even among people in the highest quintile of monthly spending, 56.44% of the income is still spent on food. The population of Southwest Sumba is heavily dependent on the consumption of rice, which accounted for the biggest proportion of food expenditures. Increases in rice prices affect them heavily.

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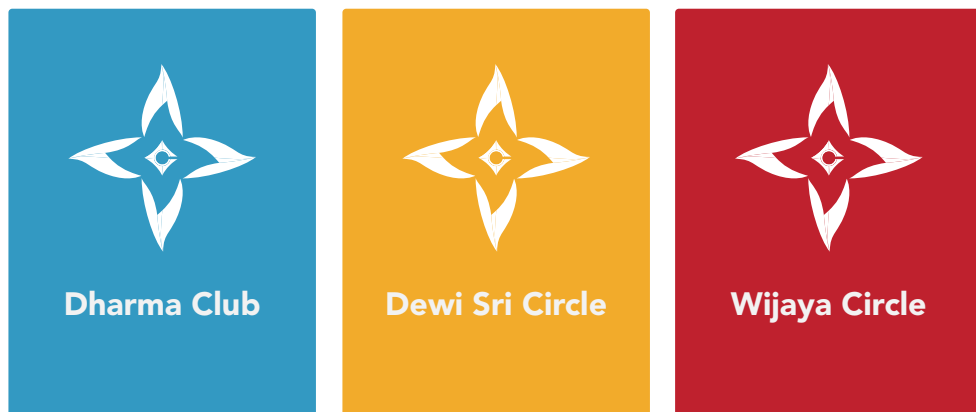
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