



Report

Policy Analysis Study to Support Advocacy on
Increasing Farmers Income by IMSD Approach

Moringa Project - Wahana Visi Indonesia

Submitted by

CREDOS Institute



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1. Development Context

Poverty in the agriculture sector is one of Indonesia's main development challenges. Agriculture households are overrepresented in Indonesia's poverty profile. Although only a third of the workforce works in the agricultural sector,¹ about half of the Indonesian households with consumption levels below the national poverty line is agriculture households (Table 1)².

Table 1. Share of Agriculture Households in Total Poor Households in Indonesia

Year	Share (%)
2013	52.89
2014	51.18
2015	53.58
2016	50.84
2017	49.90
2018	49.00
2019	49.41
2020	46.30

Source: BPS (2021) from SUSENAS March 2013-2020, based on consumption approach.
<https://www.bps.go.id/indicator/23/207/4/karakteristik-rumah-tangga-menurut-status-kemisikinan.html>

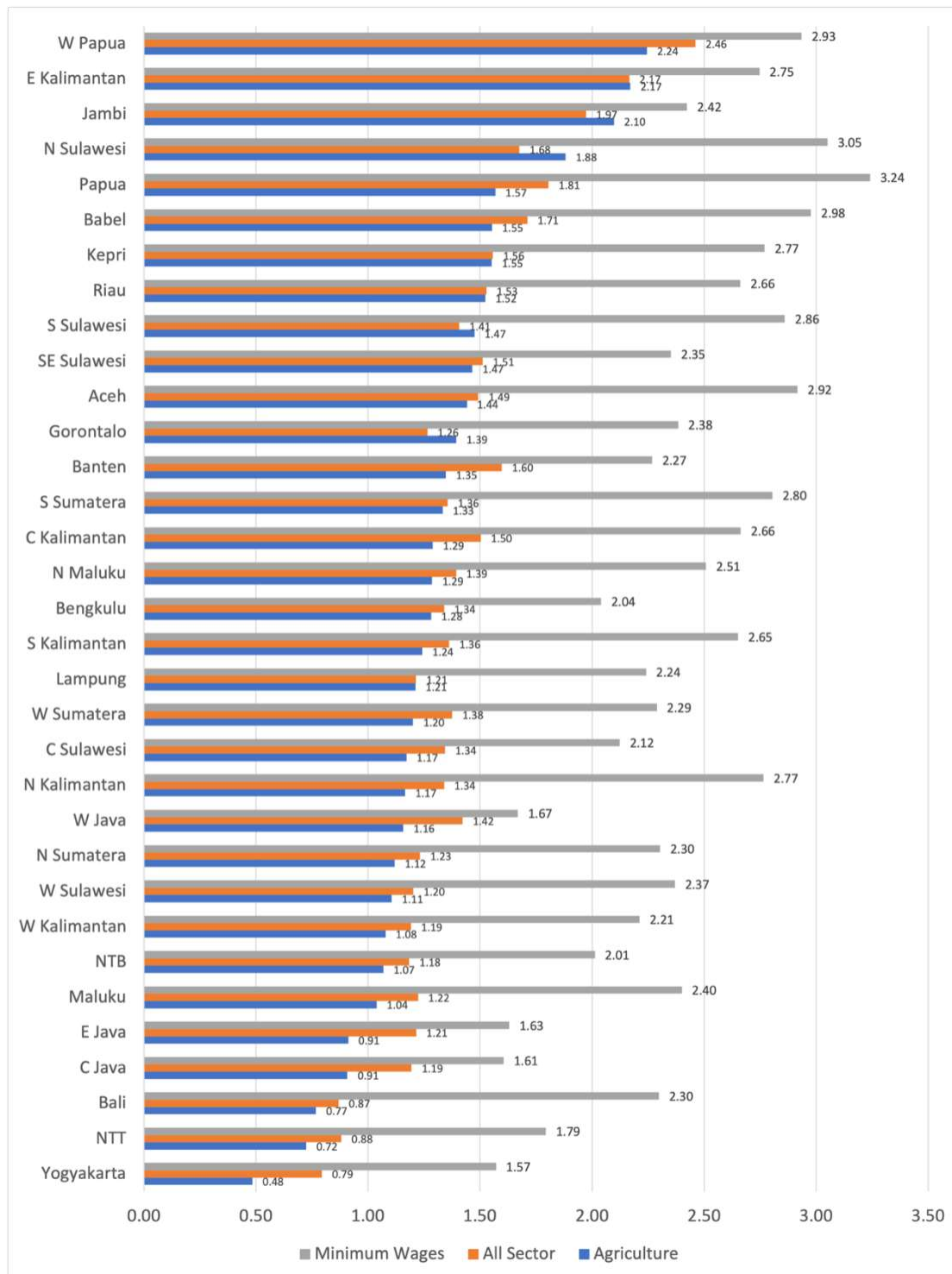
The high level of poverty in the agricultural sector is triggered by the low income of smallholder farmers relative to a decent living. In 2019 in East Nusa Tenggara, North Maluku, and Central Sulawesi, farmers' income is much lower than the average income of workers of all sectors and much lower than that of the needs of a decent living, as reflected in provincial minimum wages (Figure 1). One year after the COVID-19 pandemic, in 2021, the average and median income dropped further due to lower production and productivity. In NTT average monthly income of self-employed farmers dropped from IDR0.72 thousand in 2019 to IDR 0.1 thousand per farmer in 2021. In Central Sulawesi average monthly income of self-employed farmers dropped from IDR1.17 thousand in 2019 to IDR 0.46 thousand per farmer in 2021. In North Maluku average monthly income of self-employed farmers dropped from IDR1.29 thousand in 2019 to IDR 0.47 thousand per farmer in 2021 (see Figure 2 for 2021 Income in agriculture and other sectors).

¹ UNICEF, UNDP, Prospera, and SMERU (2021) Analysis of the Social and Economic Impacts of COVID-19 on Households and Strategic Policy Recommendations for Indonesia. Jakarta

² <https://www.bps.go.id/indicator/23/207/4/karakteristik-rumah-tangga-menurut-status-kemisikinan.html>. The poverty rate is based on a consumption approach that includes earned income and transfer, includes social safety nets.

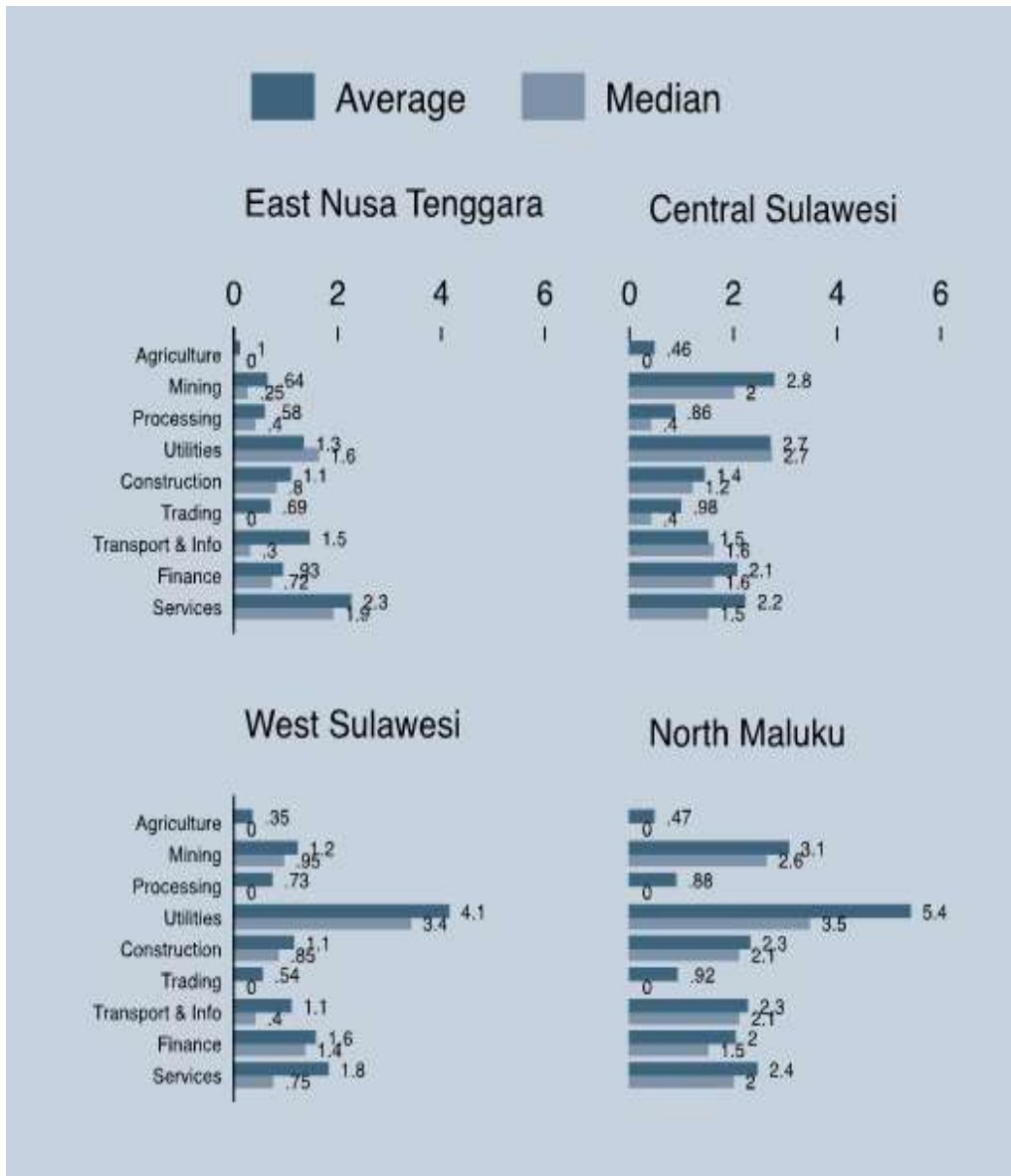
This low income implies low savings and makes it difficult for farmers to (re) invest in tools and machines needed to boost agricultural productivity.

Figure 1. Average Income of Labor in Agriculture Sector, All Sectors, and Province Minimum Wage in 2019



Source: Average Income is analyzed from National Labor Survey (Sakernas) February 2019; Minimum wages from Circular Letter of the Minister of Manpower Number B-m/308/HL.01.00/X/2019 dated 15 October, 2019

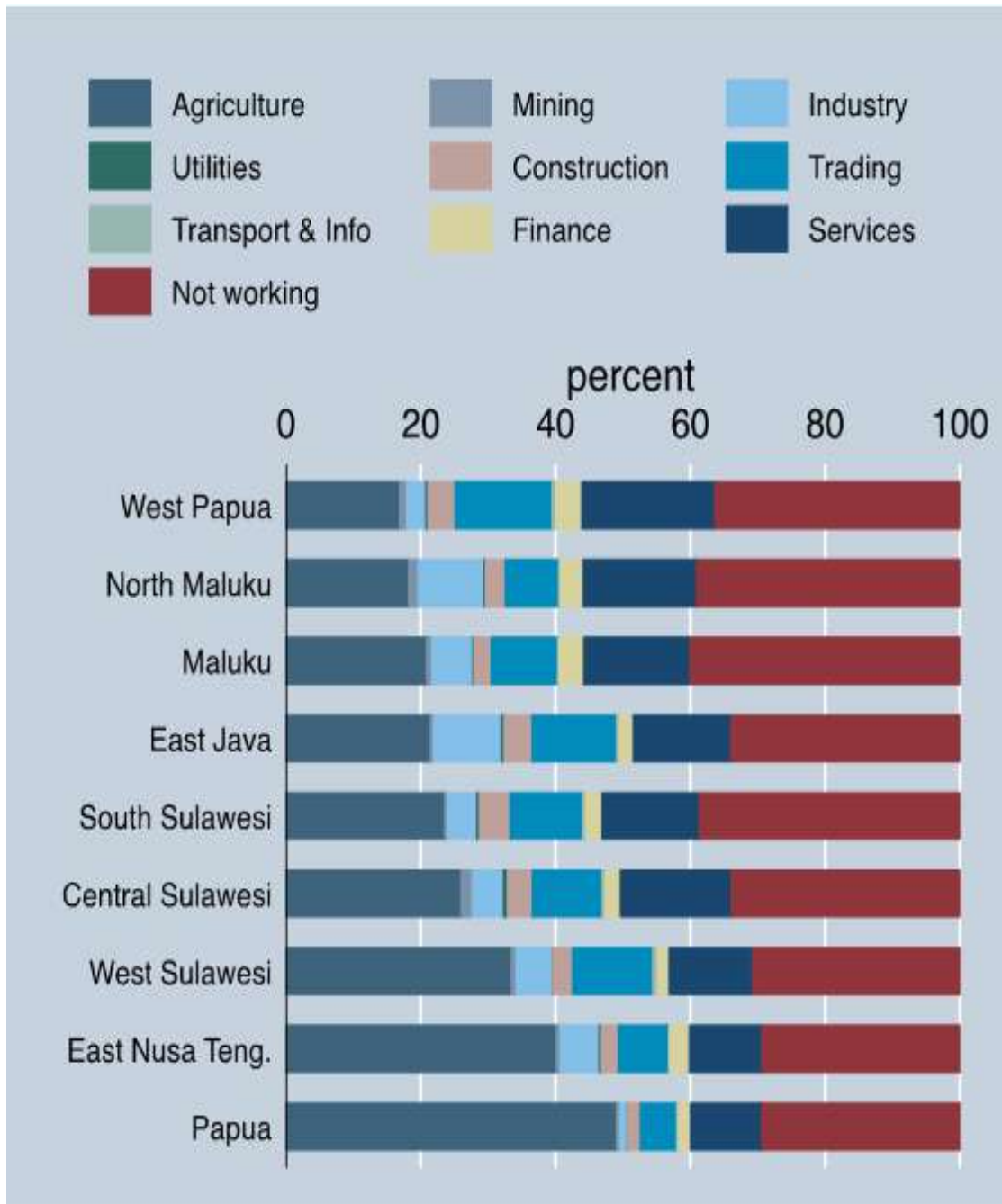
Figure 2. Workers' Monthly Income (million IDR) by Sector in February 2021



Source: Analysed from Labor Force survey (*Survei Tenaga Kerja Nasional, SAKERNAS*) February 2021

As of February 2021, the agriculture sector is still the highest labor share (Figure 3). East Nusa Tenggara has the highest labor share in the agriculture sector among the three MORINGA provinces, followed by Central Sulawesi and North Maluku. There is also an additional burden with the significant presence of the labor force who are not working (Figure 3). Wisdom from previous economic crises suggests that the agriculture sector is the buffer sector in times of crisis. Hence, facilitating easy entry to the agriculture sector for the non-working labor force could be one option to boost employment and income despite the ongoing COVID-19 pandemic. Therefore, it is crucial to boost the productivity and income of farmers to achieve equal welfare and poverty alleviation across sectors.

Figure 3. Sector Labor share including non-working sub-population



Source: Analysed from Labor Force survey (Sakernas) February 2021

The leading causes of low income in the agriculture sector include market failure in input and output markets that trigger insufficient technological adoption in cultivation, harvest, post-harvest technology, and marketing and distribution. If farmers are willing to improve their revenue, income, and welfare, their active integration into the relevant input or output markets has been identified as among the keys to improving farming practices and boosting productivity, revenue, and income.

The World Vision Indonesia's MORINGA project aims to improve farmers' income by transforming the farmers' comparative advantage into a competitive advantage through the Inclusive Market System Development (iMSD) approach. In May 2018, the project intervened on moringa and maize farm in Central Sulawesi and NTT, pili nuts (*Pili nuts*) in East Nusa Tenggara, and nutmeg in North Maluku. The project intervenes in the input market (maize, rice) and output market (moringa, pili nut, nutmeg). The project impact evaluation in 2020 found that the iMSD Approach in maize farming in Central Sulawesi, through more availability and accessibility of farm inputs such as hybrid seed and related training, boosts farmers' income by 53%. Meanwhile, in the Alor district in East Nusa Tenggara, the adoption of processing technology due to direct linkage with take-offer has boosted the revenue of the smallholder pili-nuts processors.

If adopted strategically and extensively, this MORINGA's iMSD method of intervention can potentially have a regional and national economic impact on farmers' income and its correlates, such as food security, export revenue, and poverty alleviation. This study serves to find a strategy to inject the iMSD approach into Indonesia's agriculture policy landscape and program, particularly in maize, nutmeg, pili-nuts, and related commodities.

2. Study Objectives and Methodology

The purpose of this study is to:

- Review the agriculture policies that are currently in effect. The focus commodities are maize (Central Sulawesi), nutmeg (North Maluku), pili nuts, rice, and horticulture (East Nusa Tenggara).
- Identify gaps in the existing policies, with respect to their relevance to boosting farm productivity and farmers income.
- Make recommendations on how to address the gaps in the existing policy framework of agriculture.

This study draws data from primary and secondary sources.

The secondary sources are:

1. Government regulation, surveys, and censuses,
2. Trading and prices data,
3. Academic publications,
4. News on events related to government and non-government projects, and
5. WVI MORINGA project's reports

Meanwhile, the primary sources are:

1. Virtual Focus Group Discussions with WVI MORINGA management in Central Sulawesi, North Maluku, and East Nusa Tenggara.
2. Face-to-face informant interviews with farmers, MORINGA partners, and government officials in Timor Island.

Consultancy Team

The proposed Consultancy Team is presented in Table 1.

No	Nama	Expertise	Roles in the planned Baseline	Homebase
1	Umbu Reku Raya, PhD	Economist and Agro-industry Analyst. Has previous consultancy work with Wahana Visi Indonesia in NTT and North Maluku	Team Leader Instrument design Policy Mapping AHP Data analysis and reporting	Sumba NTT
2	Stefanus Sampe, PhD	Public Policy Analyst. Has previous consultancy work with Wahana Visi	PIC Central Sulawesi Instrument design Policy mapping	Manado, North Sulawesi
3	Andrey Damaledo, PhD	Development Anthropologist	PIC NTT Instrument design Policy mapping Data analysis and reporting	Kupang NTT
4	Wardis Girsang, PhD	Rural Development Analyst. Has previous consultancy work with Wahana Visi Indonesia in North Maluku	PIC North Maluku Instrument design Policy mapping Data analysis and reporting	Ambon, Maluku

3. Policy and Gap Analysis

3.1. Agriculture Policy Landscape

Because of its control over a huge proportion of tax revenue and budget, the central government is the primary policy setter when it comes to agricultural development. The national agriculture policies that are currently in effect are framed in the 2012 Food Law. The main aim of the law is boosting food sovereignty and self-reliance with huge government transfers. The government selected the target commodities (see Table 2 annexed for detail of the target commodities) and ran either business as usual strategy (i.e., subsidies) or an expansion strategy (i.e., Presidential Special Effort and Food Estate programs). Under this food sovereignty objective, the primary commodities of intervention are the staple food and essential foods, including rice, maize, soybean, cooking oil, sugar, eggs, chicken, and beef.

The derivatives of the former are:

1. Annual seed and fertilizer subsidies for smallholder farmers,
2. Price regulation including export/import restriction,
3. President Special Efforts (*Upaya Khusus*, UPSUS) on seven commodities,
4. The Decree of Minister of Agriculture (MoA) No. 472/2018 on zonation of national priority commodities, and
5. The Food Estate project.

Together the seed and fertilizer subsidy program and the price regulation are the core policy. The subsidy program is the biggest program in terms of number of farmers covered. It is to cover all smallholder farmers in Indonesia. There are indications that rice is heavily regulated to assure abundant availability at a low but stable price (Octania, 2021; Respatiadi and Nabila, 2017). Maize is also heavily regulated to assure low prices of maize to supply into feed industries to boost production and availability of meat at stable and cheap prices (Freddy, Respatiadi, and Gupta, 2018; Freddy and Gupta, 2018). The government placed import restrictions on both commodities except for premium (flavoured) rice and maize for human consumption. The latter is due to the high aflatoxin content in local maize.

On top of the two core policies, the central government implemented The Presidential Special Effort (2016-2019) (UPSUS) for improving productivity of the existing cultivation system for seven commodities. They are:

1. Paddy,
2. Soybean,
3. Maize,
4. Chili,
5. Onion,
6. Cattle, and
7. Water Buffaloes

The first three commodities are the main staple food. Chili and onion are main food seasonings. Maize and soybean are the biggest components of feed industry that is perceived to maintain affordable provision of chicken meat and eggs as source of protein. Meanwhile, beef is the more expensive source of protein. Water buffalo meat is the close substitute to beef.

On the food and horticulture crops, the Special Effort program work on boosting mechanisation and water availability on the existing labour-intensive farming and, thereby, boosting farm productivity. However, a study found that the Special effort program did not boost food availability via productivity but rather via extensification on new farmlands.

Given the UPSUS cover only seven commodities, the MoA decree on national priority commodities expand the commodity coverage. The decree is a guideline on where national and local government resource is best invested regarding the location of national agricultural areas that dictates which districts receive priority of government support on cultivating food crops, horticulture, estate crops, and animal husbandry. This, the decree can be considered as augmented of the three previous UPSUS.

More recently, aiming at strengthening food security, the central government has orchestrated the Food Estate project outside Java Island including in Kalimantan, Sumatera, Papua, Maluku, the maize Rotiklot and Sukabitetek Food Estates in Belu District in East Nusa Tenggara, Sumba Tengah Food Estate in Central Sumba in East Nusa Tenggara, and a planned Food Estate in Sigi dan Donggala, near Palu, in Central Sulawesi. The Food Estate projects invest in building dams, constructing big scale plantation areas for paddy, maize, and horticulture equipped with agriculture mechanisation. It is estimated that one package of Food Estate project cost the government more than IDR 1 trillion per Food Estate location.

3.2. Food Crops and Horticulture Policy

3.2.1. Belu and South-Central Timor Districts, East Nusa Tenggara Province

The subsidy program provides farmers with a small quota of seed or seedlings and chemical fertilizers once per year. For food crops, the subsidy is given only for the first planting seasons which start around November or December. Farmers enlisted in Farmers Groups are eligible for free seed but need to pay around 20% of the market price for fertilizers. Thus, the subsidies lower the need for working capital required by smallholder farmers.

In Timor Island, the policy gaps of the seed and fertilizers subsidy program on rice and maize are:

1. Inadequate quantity and quality of seeds distributed to farmers.
 - a. In the beginning of the first planting season, farmers are allocated around 10 kg free paddy seed per hectare and 15 kg of free maize seed per hectare. The subsidized seeds are provided endogenously within the district agriculture system and the suppliers. The seed suppliers, usually local private stores, are supposedly to provide F1 seed package to seed breeder who cultivate it and sell the harvest to the supplier at a cheap price of IDR 8000 per kg. The suppliers, with approval from District Agriculture Office and Agriculture Research Centre, label the seed from the breeder with blue label. The District Agriculture Office orders the seeds and distributes it to the farmers conditional on their membership in farmers group.
 - b. Moreover, the quantity of subsidized seed packages provided is small compared to farmers need for the whole year. It does not cater for the second or third planting seasons for locations that are not water-limited. There is a need to establish inclusive market system of high-quality seed for both maize and rice all the way to the villages to boost availability of quality seeds and subsequently productivity. The needs appear to be higher during second or third planting season compared to the need in first planting season.
2. Fertilizers are not always timely available, and the stores are far, risking farmers to not apply proper fertilization during the first two weeks of planting if they do not have working capital to buy fertilizers at the market rate. Fertilizers are not locally produced. Previously, there was more subsidized fertilizers available for farmers in villages when the fertilizers were distributed by *Koperasi Unit Desa (KUD)*, a village cooperative entity. There is a need to establish supply chain all the way to village level both for subsidized and non-subsidized fertilizers, possible through private stores and BUMDES.
3. The subsidy program does not adequately address the lack of good agriculture practices among the farmers, including water availability. Even in the irrigated areas such as Bena in South-Central Timor and Sukabitetek in Belu, water availability is low during August to October both due to low rainfall and lack of water conservation due to natural disaster (i.e., Seroja cyclone) and deforestation. Unfortunately, in Belu, the development of Rotiklot dam

and Food Estate was done through deforestation. The Food Estate location was previously a forest. There is a need to run a water harvesting, water conservation, and climate change mitigation to boost water availability. On related issue, farmers who use irrigated water pay a too small amount of water fee, around IDR30 thousand per planting season. Cumulatively, the small amount of money is not sufficient to perform rehabilitation of tertiary canals when there is a need to do so. This water fee arrangement needs to be addressed to guarantee stable irrigation water services.

For food crops, the central government considers that districts in Timor Islands have more comparative advantage on maize than on rice. This means that maize cultivation is on top government funding priority. This is evident with the selection of maize for the Rotiklot Food Estate in Belu (on-going cultivation) and Sukabitetek Food Estate in Belu (under construction). Both areas use sprinkles technology from either dam (Rotiklot) or deep well (Sukabitetek). From the Rotiklot first-year experience, the main advantages of the maize Food Estate program in Belu are:

1. The availability of water infrastructure with sprinkles technology
2. The availability to modern machinery and tools
3. The availability of full subsidies seeds, fertilizers, and other inputs

However, there are policy gaps with the Food Estate project in Belu:

1. Land conversion. In Sukabitetek, the government converted rice fields to private maize fields, while in Rotiklot the government convert the public forest land to maize field. The land conversion has already been done so there is nothing to do to reverse it.
2. In Rotiklot Food Estate, there is lack of participation of poor and smallholder farmers in cultivation process during the first (August 2021) and second (December 2021) maize plantation. Possibly due to shortage of labor from the farmer's side and unclear ownership status of the farmland, those who work on land preparation and cultivation are public servants from the District Agriculture Office, including the agriculture extension workers (*penyuluh pertanian*) from outside Rotiklot.
3. Mismanagement: Managed mainly by Central government, the project run under unclear separation of role and responsibilities between the central government, local government, and local farmer.
4. Low productivity: Only 16 ha of 53 ha maize fields were harvested during the first planting (August-November 2021). One resource person mentioned that the sprinkler system did not work properly during that time due to low water levels in the Rotiklot dam. Moreover, there was no discipline for the implementation of good agriculture practice due to shortage of labor.

The local agriculture agency believes that there is a need for an NGO to 'bridge' the technological transfer from the central government to the local farmers. Subsequently, farmers need to be trained in good maize agricultural practices and management so that they are ready to fully takeover the cultivation works in 2022/2023 planting season.

The almost similar problem occurred under the Governor's TJPS program. TJPS is the abbreviation for *Tanam Jagung Panen Sapi*, translated as "Planting Maize Harvest Cattle". The program has almost similar principles to Rotiklot Food Estate with smaller scale of investment on machinery but without additional investment on water infrastructure. The budget and expenditure for the program is managed directly by the province government. Among others, the program run maize plantation during the late second planting seasons of 2019 and 2020 in Bena basin in South Central Timor under the management of the Provincial government. Usually in that time the rice farmers in Bena left their fields uncultivated so that their cattle can graze on the leftover paddy stalk and greens. Cattle is the primary source of big cash income for the farmers, among others to pay for their children school fees.

In Bena basin, the policy gaps with the Governor's TJPS program are:

1. Farmers do not prefer to cultivate rice or maize right after the first season harvest time or during the early second planting season because they prefer the fields to become grazing fields for their cattle. Cattle is the primary source of big cash income in the area. There needs to be a convincing Cost and Benefit Analysis on which business is more profitable: whether maize or cattle. However, given that the final intention of the program is to boost farmers financial capability to buy cattle, it is kind of counterproductive to plant maize during conventionally cattle grazing season.
2. There is shortage of labor from the farmer's side during the second or third planting season during which the maize plantation for the TJPS program occur. To make up for the shortage of labor, the TJPS program "hire" public servants from the District Government Offices to work on land preparation and cultivation.
3. Because of preference for cattle grazing over maize plantation, at one planting season, about 40% of the maize plants of the TJPS program were consumed by the cattle. Therefore, reducing the potential harvest for maize but help the cattle to survive.

The local agricultural agency believes that the main problem with the low performance of the TJPS maize plantation is because the farmers lack of willingness to change. However, the local government do not have the skill to make the change happen and expect an NGO to take role on assisting the farmers to change plantation and grazing patterns.

Beside maize and rice, the local governments in Kupang, South-Central Timor, and Belu see horticulture as the new profitable game. There has been increasing interest on horticulture cultivation, including the use of drip irrigation in water scarcity areas. The horticulture sector has also attracted young farmers to start small farming. However, according to the government agencies, the adoption of the drip irrigation technology is still small, possibly due to lack of availability and lack of affordability of the technology. The MORINGA project has previously successfully assisted horticulture farmers in North Maluku and Kupang district. The project should expand the approach to other farmers in Kupang, South-central Timor, and Belu as there is big market for horticulture and young farmers interest on horticulture signals availability of young labor in the sector.

Recommendations for the iMSD project in Belu and TTS districts

The project should make use of its successful experience in maize iMSD in Central Sulawesi to develop maize iMSD in Timor Island where market for inputs (seeds, fertilizers, water, network) and outputs are in infancy state of market development.

Beside working directly with farmers and suppliers and off-take such as in the case of maize iMSD in Central Sulawesi, the project shall build strategic alliance with

- a the Ministry of Public Work and Ministry of Agriculture who manage the Rotiklot Food Estate, and
- b The East Nusa Tenggara provincial government who manages the Bena basin TJPS program
- c The local government of South-central Timor who will manage the Temef Agriculture Economic Zone which is likely to become Temef Food Estate.

A brief policy paper on the advantage of maize iMSD with the microstructure of the iMSD intervention based on WVI experience in Central Sulawesi can become a starting point for discussion with these government agencies. WVI can offer a micro design of the Food Estate and TJSP intervention, which is lacking from the government side, in order to help those programs boost its productivity. Meanwhile WVI can propose to play the managerial role for iMSD component.

3.2.2. Kupang District

In the district of Kupang, the local government policies include the following:

- a Until 2024, the district is developing a total of 1000 hectares of land for food crops and horticulture. In the time of writing the local government is at the final stage of formulating the Sustainable Food Crops Development Policy (*Kebijakan Lahan Pertanian Pangan Berkelanjutan*) that identifies the location of the land as well as the number of farmer groups and commodities involved in the policy. The policy is expected to be adopted as a local regulation (*Perda*) in 2022 for its immediate implementation.
- b Developing maize as the superior commodity and to develop livestock feed industry in Lili of Fatuleu area.
- c Developing agro-tourism area including integrated farming projects in Baumata and Teres
- d Access provision to high-quality seeds, fertilizers, and tractors.
- e Developing agro-forestry (*mamar*) for plantation commodities
- f Post-harvest training for coconut and cashew products
- g Improving farmers' access to financial services and insurance

Issues and gaps in agricultural policies in Kupang district

- a In the plan to develop 1000 hectares of land for food crops and horticulture, the agricultural department has designated the sub-districts of Central Kupang and

Eastern Kupang for food crops production. But for the horticulture, there is a lack of data in terms of the number of farmers involved, the locations of their garden and the commodities they produce. So far, Semau and Semau Selatan have been identified for onion production. But areas where the WVI have intervened such as Besmarak and Oematnunu have not been recognized as relevant by the local government, hence overlooked for their support.

- b Despite annual programs in drilling and small dam, the integrated farming project has not fully accommodated the horticulture activities.
- c Every year, the local government can only provide up to 20 per cent of the total subsidized fertilizers needed for all farmers in Kupang district. Paddy farmers in Mata Air village as well as horticulture farmers in Besmarak have experienced low production due to the lack of subsidized fertilizers. At the same time, their input for production has also increased almost five times for the use of non-subsidized fertilizers.
- d The local government policy does not provide a clear and long-term solution to deal with pest outbreak in the horticulture activities. Involving local university to solve the problem has not brought about a positive outcome.
- e Considering the terrain, landscape, and climate in Kupang district, it is more appropriate to support the farmers with a big four-wheel tractor and the local government has planned to provide at least one big tractor in one sub-district. However, in the annual budget it is the hand tractors that have always been procured for the farmers.
- f While the '*Revolusi 5P*' (5P Revolution) policy has clearly identified plantation development, the local government lacks data on plantation production and numbers of farmers involved. As a result, little has been done to develop the commodities, particularly coconut and cashew.
- g In terms of access to market, the local government is expected to use the BUMDES. However, most of the BUMDES do not have strong market link due to lack of capital, weak staffing, and lack of profit orientation. In some villages, there is no existing BUMDES in the village. For example, farmers in Mata Air village have been informed that the local BUMDES will buy their harvest. Yet, the promised BUMDES is not available, making the farmers to sell their harvest to the local market directly.

Recommendations for the IMSD project in Kupang district

- a Various factors have contributed to the low production of the hybrid seed for paddy rice initiated by the IMSD project. While this provides a challenge to make the case for its adoption, it is possible to approach the local government to try the seed in their new land as part of the 1000 hectares policy.
- b Provision of big tractors in every sub-district should be implemented accordingly. This can be beneficial for both paddy farmers and horticulture farmers.

- c The local government has annual program and funding to provide water through drilling and small dam. The IMSD could make the most of this effort by providing data on the numbers and locations of horticulture farmers under its intervention.
- d IMSD could promote drip irrigation and other horticulture approach to be integrated into the local government integrated farming project. The sites for this project are Baumata and Teres.
- e IMSD could support the local government in post-harvest activities of coconut and cashew.
- f Provision of timely and readily subsidized fertilizers for all farmers groups is essential to increase production. IMSD could utilize its resources to develop organic fertilizers to fill the 80 per cent gaps in subsidized fertilizers. Other way is to advise the provincial government to reduce the use the non-subsidized fertilizers in their maize production program.
- g There needs to be a thorough feasibility assessment on BUMDES if IMSD is planning to involve them in the project.

3.2.3. Central Sulawesi

Implementation of iMSD approach is relatively successful to raise the maize farmers' income in Central Sulawesi province a. Through the intervention carried out by WVI since 2017, farmers can double their maize production, from 3-4 tons per hectare to 7-9 tons per hectare. The farmers' maize quality has also improved significantly because of assistance on good agriculture practices including the selection of seeds, the use of fertilizer, and post-harvest treatment. This improvement of maize quality has strengthened the farmers' bargaining power when dealing with their potential buyers in market. With the improvement in quality, the maize price has increased from Rp. 2,800 per kilo in 2017 to around Rp. 5,000 today. In addition, with the attractive price of maize, many farmers have begun to replace their crops such as cocoa and rice with maize in this region.

Government policy

To increase the maize production and productivity for import substitution, the government has implemented "*Upsus*" (*upaya khusus*/special efforts) policy since 2015. The policy is designed to increase production and productivity of food crops such are rice, maize, and soybean through special efforts to achieve food self-sufficiency and food security. The government's special efforts to regulate price and restriction on maize imports have provided benefits for maize farmers in Central Sulawesi Province. The Trade Ministry's regulation no. 27/2017 has set the price of shelled corn at Rp. 3,150/kg with water moisture content of 15 percent. This has kept the price of corn from falling, especially at harvest time. Indeed, this policy has positive impact on the implementation of IMSD program. However, the special efforts policy has not contributed yet to increasing farmer productivity because it is a top-down policy designed by

central government, so it does not meet the needs of local maize farmers and is weak in monitoring its implementation in Central Sulawesi Province. This causes some problems in its implementation such as the seeds that reach the farmers are of poor quality; the fertilizer that comes to farmers at the wrong time and of poor quality, and lack of infrastructure development especially for drying and storing the maize after harvest. In monitoring the policy, the maize farmers do not have access to report discrepancies between what they need and what the government bureaucracy provides.

Policy gaps and Recommendation

There are some policy gaps which need to be addressed for improving the program in the current maize iMSD.

- a Lack of financing for smallholder farmers to increase their farm scale. This is including the use of village funds to increase maize production, such as procurement of seeds, fertilizer and pesticide, and agricultural infrastructure development.
- b Low number of agricultural extension workers compared to the area covered. Boosting the number of trained farmers to make up for the shortage of extension workers is important to provide enable more technology transfer on good farming practices to the maize farmers.

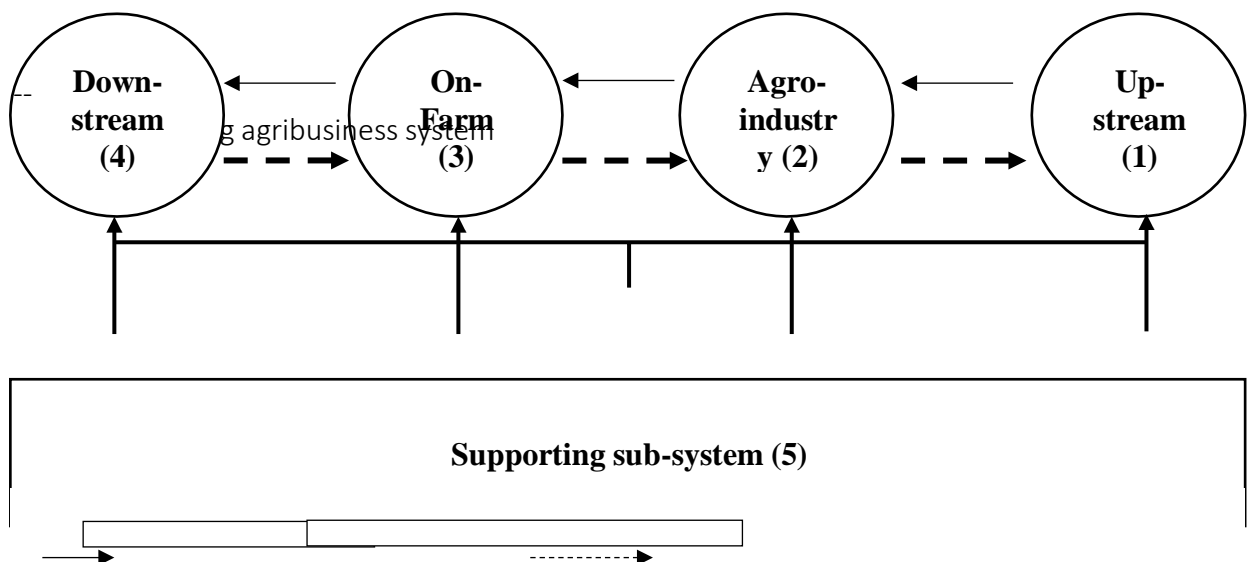
While there is a need to keep expanding the maize iMSD, there is also a need to create a paddy iMSD. Paddy is the national priority commodity for greater Palu/Sigi/Donggala. However, there is problem of low productivity in the rice sector in Central Sulawesi. In the meantime, the Central and Province Governments are preparing for the Greater Palu/Sigi/Donggala Food Estate which likely to target maize and rice. A paddy iMSD program would fit both the Food Estate development as well as boosting farmers' capacity, paddy productivity and farmers income outside of the Food Estate.

3.2. Nutmeg Smallholder Plantation Policy

Crop estates such as nutmeg are covered in the Decree of Minister of Agriculture No. 472/2018 on national priority commodities. Moreover, the current main program from the national government is the Seeds Superior Plantation (BUN) 500. BUN500 is a program for distributing 500 million plantation export seeds with a target of plantation extensification of 1 million hectares and an increase in farmers' income of Rp. 1000 trillion. Besides nutmeg, other commodities covered by BUN500 are coffee, pepper, cloves, cocoa, rubber, deep coconut, sugar cane, tea, and cashew nuts. Half of the procurement for seeds will be self-provided by the government's nursery and the rest by private entities. The latter is an opportunity for backward integration for a farming corporation to invest and engage the input market actively.

Policy intervention on inclusive nutmeg market system development can be seen from the perspective of the agribusiness system. The agribusiness system consists of five sub-systems: up-stream, on-farm, agro-industry, down-stream, and supporting (institutional) sub- system. These sub-systems are integrated, systemic, harmonious, synergy, functional, and interdependent. The basic principle of the system is that the total sum is greater than the sum of its parts. It starts from the market (demand-side/market information) at the up- stream sub- system and will continue to agro-industry and on-farm, and then, it will end to the market. The supporting sub-system is necessary but not sufficient without linking to the downstream, on- farm, agro-industry, and up- stream sub-system to create harmony due to the agribusiness system. The relationship between the nutmeg agribusiness sub-system can be depicted in Figure 4.

Figure 4. The relationship between the nutmeg agribusiness sub-system



Based on discussion with World Vision field staff, nutmeg farmers have already had excellent access to the local market for a long time. There are many nutmeg off-takers or traders at the village, sub-district, district, and provincial levels. Generally, farmers have no difficulties in selling nutmeg commodities and products. In fact, the farmer will sell nutmeg products to the local trader who has developed good relationships, can always buy all kinds of nutmeg products, and is willing to provide production input supplies and financial support to fulfill the daily needs of the farmer household. This means that a farmer chooses a local trader specific as a patron to build a client-patron relationship. As a patron, the trader is like a father to provide all kinds of farmer's needs, but as a client, the farmer will have insurance though he must depend on and must sell all nutmeg product to the particular trader. Thus, even though many traders are in the region, farmers only tend to sell and rely on a specific trader. Farmer's harvest, transport, and sell nutmeg commodities without grading and classifying to the off-taker. Farmers are price takers and receive lower price because farmer alone has no bargaining position to determine the price. In several cases, the off-taker will

reduce the revenue of the nutmeg farmer to pay for the previous debt. As a result, most nutmeg farmers are still poor.

Fundamentally, the main problem of nutmeg farmer poverty is not access to the nutmeg market because the market is already there, but the structure of the market system that creates farmer dependency on the specific trader. Further, the problem of nutmeg farmers is not only market structure, but also nutmeg product quantity (production), productivity, quality (added value), and continuity at the same time. These problems have a significant relationship with the other agribusiness sub-systems, including agro-industry, on-farm, downstream, and supporting sub-systems. Therefore, inclusive market system development needs to be seen from the perspective of agribusiness systems because single market policy intervention (policy intervention on upstream only) will not fit to solve the complex problems of nutmeg farmer poverty.

The question is what kind of relevant intervention should World Vision (WV) propose in future action to improve nutmeg farmer household prosperity? WV Field staff stated that, on the demand side, nutmeg farmers have a dependency on a trader (off-taker) as a patron. Then, farmers tend to receive low nutmeg prices because of a lack of knowledge and skill regarding agro-industry treatments toward nutmeg commodities such as drying, grading, packaging, and labeling. On the supply side, farmers have a small size of nutmeg farmland, lack of knowledge and access to high yield seed varieties, organic fertilizers, and bio-pesticides technology to improve soil and crop productivity, limited farm labor to nurture and harvest the crops, as well as distant and poor farm road infrastructures. There are four policy recommendations to reduce nutmeg farmer poverty.

Recommendation 1: Strengthening role of patron-client in trader-farmer relationship

WVI intervention to improve market structure is based on ways to liberate some farmers from patron-client system so that farmer will have self-determination to sell nutmeg products to other traders or off-takers to get the highest price. This is difficult because farmer become a client for a specific trader as the guarantee for the nutmeg market and the source of cash money to fulfill family's daily basic needs. Values, norms, and trust drive the Patron-client relationship between off-taker and farmer. A patron-client relationship is a rational choice because the farmer believes that the trader will buy farmer nutmeg products at a competitive price. The government has formed farmer groups, village unit cooperatives, or Village Owned Enterprises (Badan Usaha Milik Desa-Bumdes). Still, these institutions cannot replace the trader's role as patron to the farmer. Farmers might not have trust in farmer groups and cooperatives. Therefore, policy intervention on the demand side is a way to strengthen the positive patron-client relationship between off-taker and nutmeg farmers so that farmers will get the best nutmeg price to improve household income and prosperity. At the same time, the farmer's household needs to develop a saving habit, reduce consumptive behavior, and enhance capital formation to fulfill daily basic needs.

Recommendation 2: Nutmeg product quality improvement

The government had provided agro-industry technology packages and aids like dryer houses to improve nutmeg quality for some farmers. Also, Provincial and district agriculture offices have developed extension service programs and activities to increase knowledge, improve attitude, and enhance farmers' skills about post-harvesting treatment such as storing, drying, sorting, grading, and packaging nutmeg products. If the best quality-price is Rp100,000/kg and the lowest quality is Rp 60,000/kg, hence farmer will get the price margin opportunity around Rp40,000/kg. The extension service program failed to change farmers' knowledge, attitude, and skill. Furthermore, farmers mistreat nutmeg dryer technology packages assistance. As a result, farmers failed to improve quality and lost the opportunity for the margin price and added value of nutmeg products. This occurs because agriculture office and extension service workers used the *top-down* approach. Hence, policy intervention on the agro-industry sub-system allows WVI staff to facilitate rural extension service workers using a participatory and *bottom-up* approach. The purpose is to change farmers' knowledge, attitude, and behavior to improve nutmeg product quality.

Recommendation 3: Productivity improvement

The MORINGA project estimated that a one-hectare nutmeg plantation consists of 100 productive plants, and its products can be up to 10 kg/tree/year. The land size of the farm is various, but the average farmland size is 0.75 ha. The farmer usually does not use external technology inputs (high yield seeds variety, organic fertilizers, and pesticides). Therefore, it caused low productivity on the farm level, 2-3 kg/tree/year³. If the nutmeg productivity is about one ton per ha/year, then the total revenue from nutmeg seed is Rp100 million per year. In addition, if mace productivity is about 12% of total seed production, total revenue from a mace is about Rp24 million/ha/year. Thus, the total revenue of nutmeg farmers is up to Rp124 million/ha/year (USD 8552). Simanjong et al. (2020) found that productivity of nutmeg on the farm level is around 1.28 kg/tree/year or 128 kg/tree/year, while mace productivity was about 12% of total nutmeg seed production⁴. According to BPS (2021), the average nutmeg productivity in North Maluku is around 168 kg/ha/year. In this case, the total revenue of nutmeg farmers can be estimated at approximately Rp16.8 million/ha/year from seeds and Rp4.03 million from mace production. It means the total revenue of nutmeg farmers is up to Rp20.83 million (USD1437) per ha/year. Thereby, total revenue will decline at the smaller land size and lower nutmeg price because of low production and low product quality.

The first policy intervention is to improve productivity by introducing high-yield seed varieties. The local government has to develop nutmeg high yield seed varieties through

³ Base on focus group interview World Vision Field Staff, 2021 in North Maluku province.

⁴ Simanjong TM, Irham, Waluyati LR, Mulyo JH. 2020. Comparative and competitive advantages of nutmeg farming in two regions in Maluku Province, Indonesia. *Biodiversitas* 21: 1165-1173. Private profit was 19,706/tree whilst social profit was Rp54,012/tree. Total cost is estimated Rp12,126/tree where family labor cost is 75% of total cost.

nutmeg seed breeder groups and research and development agencies. Second, WVI staff have facilitated input technology called bio-converted fertilizer to fertilize the soil and protect nutmeg crops from pests and disease. WVI staff stated that plot demonstration on farm level showed a significant impact of bio-converted fertilizer on nutmeg productivity. Most farmers have applied bio-converted fertilizer to horticulture crops, but few farmers apply to nutmeg plantations. It takes time for the adoption of innovation. The farmer will adopt new technology based on the principle: *seeing is believing*. For that reason, The MORINGA project have an important role in bridging the partnership between the bio-converted fertilizer company in Bekasi City, Java, and nutmeg buyers in North Maluku province. Nutmeg buyers have to collaborate with rural extension services to disseminate and expand bio-converted fertilizer use at the commercial price. Third, nutmeg plantation farm lacks labor in rural areas because the young generation does not like to work on a farm. The primary source of nutmeg farmworkers are parents and older family members. Besides, farmers have limited cash to pay laborers from outside the family. Expanding nutmeg plantations to the new land became more difficult because of limited fertile plantation land. As a consequence, limited labor will influence the limited land size, low production, and low income. Therefore, strategy priority is to intensify existing land use, practice nutmeg crop rejuvenation, and replace unproductive crops.

Recommendation 4: Farm Road improvement

Since the farms have poor road infrastructure, farmers take about 1-3 hours to walk from the village to the nutmeg farm. Consequently, farmers have limited capacity to transport nutmeg yields from the farm to the village. The far location from the village, poor transportation, and communication infrastructures cause a lack of farmers' motivation to increase nutmeg production and productivity. The local government should improve farm road infrastructure to save time and have easier access to transport nutmeg products.

To sum these statements, affirmative action policy interventions are pivotal to reduce poverty among nutmeg farmers. There is no single solution that fits to solve the problems of nutmeg farmer poverty. Several actions that might be relevant to prioritize. First, national government policy fails to form corporate farmer or village cooperatives through farmer groups' development. As an alternative, The MORINGA project needs to facilitate farmers and off-takers to strengthen the mutually beneficial relationship between buyer and farmer. Second, The MORINGA project must facilitate farmers to improve nutmeg productivity at the supply side through sustaining bio-converted fertilizer application and replacing unproductive crops with local high-yield seed varieties. Rural extension services need to hire farmers to enhance the quality of nutmeg and added value through post-harvest handling, drying, sorting, grading, labelling, and packaging. Finally, cooperation between policymakers, scientists, and private enterprises (Triple helix) is the key success factor to improve nutmeg farmer income and prosperity. The local government should have supported a farmer with a one-hectare intensive nutmeg plantation to earn income of around Rp20 million per year. This income

might be enough to reduce farmer poverty, maintain production, and improve quality and livelihood sustainability.

Recommendation 5: Turn around Strategy

Possible due to lack of risk raking preference, there is a problem of "lack of willingness to change" among nutmeg farmers from business as usual to a more intensive agricultural practice. The MORINGA Impact Evaluation results seems to suggest that the horticulture intervention has higher adoption and profit rate compared to the nutmeg intervention. If the problem risk preference persists, the future intervention shall turnaround from nutmeg and focus on the horticulture.

3.3. Pili-nuts Policy

Existing Policies Pili Nuts and Non-Timber Forest Products

As a non-timber forest product, pili nuts in Alor have been specifically identified as one of the priority commodities along with candle nut (*kemiri*), honey (*madu*), bamboo (*bambu*), cashew (*mete*), betel nut (*pinang*), palm (*lontar*), tamarind (*asam*), nutmeg (*pala*), moringa (*kelor*), betel (*sirih*), avocado (*alpukat*), eucalyptus (*kayu putih*), and laccifer laca (*kutu lak*). This is clearly outlined in the Governor’s Decree Number 404/KEP/HK/2018, 21 December 2018 on the list of top priority non-timber products in NTT province.

The following table provides more detailed policies related to non-timber products ranging from the farmers’ access to pili nuts to the collection procedures (Table 4).

Table 5. Government policies related to Non-Timber Forest Products (NTFPs)

No	Category	Policies	Description
1	Foraging access to government forest	<p>The central government: Regulation of the Minister of Environment and Forestry Number P.54/MenLHK/Setjen/Kum.1/6/2016 concerning Procedures for Granting and Extension of Permits for Collection of Forest Products or Non-Timber Forest Products in State Forests.</p> <p>The local government: East Nusa Tenggara Regional Regulation Number 6 of 2017 concerning NTFP Management in East Nusa Tenggara</p>	Basically farmers are allowed access to arrange permit to collect, pick, and harvest, non-timber products (HHBK) from the government forests, for a particular period of time, in a particular amount.

No	Category	Policies	Description
2	Development strategies for non-timber forest products (NTFP) in NTT province	Governor Regulation Number 60 of 2018 concerning the Grand Strategy of NTFP Management in East Nusa Tenggara	
3	List of priority non-timber forest products in NTT province	Governor's Decree Number: 404/KEP/HK/2018 dated December 21, 2018 concerning the Determination of the Preferred NTFPs of the Province of East Nusa Tenggara	specifically identified pili nuts as one of the priority commodities
4	Non-timber forest products collection procedures	Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.54/MenLHK/Setjen/Kum.1/6/2016 tentang Tata Cara Pemberian dan Perpanjangan Ijin Pemungutan Hasil Hutan atau Hasil Hutan Bukan Kayu pada Hutan Negara (Berita Negara Republik Indonesia Tahun 2016 Nomor 1039)	To date, the permits and procedures are only used by individuals and/or groups who are working on honey and bamboo business.

Source: Key informant interview, 2021

Policy Gaps

Considering the production, market system, and existing policies on pili nuts development in Alor district, there are three major policy gaps that needs to be considered for future program improvements:

- Data
Data management and analysis has always been a classic problem in agricultural commodities, and particularly pili nuts in Alor district. For example, despite bearing the name pili nuts or Nusa Kenari, the district government does not have any information whatsoever on pili nuts in their previous and current development planning policies (RPJMD). As we can see from the following table, pili nuts are not identified as priority commodities in Alor in the last 5 years, resulting in no specific policies for its development. It is more challenging in terms of the pili nuts because some of the trees are in privately owned land such as in the Lahawing village with lack of interest in plating new trees to improve production.
- Budget Allocation

Both central and local government budget allocation for non-timber products development have so far been focusing on community forestry that is dealing with economic empowerment for villagers living around the forest area. Little attention has been paid on the way to enable business model for farmers to work together and increasing their production, marketing strategies, and eventually profit margin.

- Developing the center for non-timber products

NTT province has so far successfully developed two centers for non-timber forest products:

1. The center for Mutis Honey management, located at the Fatumnasi forest region of South-Central Timor district.
2. The center for Bamboo management in Ngada district. Both centers involve private investors (including BUMDES) and the community as their business model, enabling the farmers to form coalition and increase their leverage in the market and eventually profit margin.

These two centers could serve as one of the best practice policies in the development of other non-timber products, including the pili nut.

4. Recommendations

1. Using the previous success in maize iMSD in Central Sulawesi as the stepping stone, we recommend the MORINGA project for an expansion strategy for maize, paddy, and horticulture iMSD in Timor Island. This expansion includes building strategic alliances with the main "capital-owner" in the agricultural development in Timor Island which are currently:
 - a. The Ministry of Public Works and the Ministry of Agriculture on the Food Estate Program in Belu,
 - b. The Government of Province of East Nusa Tenggara on the TJPS Program in Bena basin,
 - c. The district government of South-central Timor on the Temef Economic Zone,
 - d. The district of Kupang on the 5P Program and Agrotourism Program

2. In the same vein, we recommend the MORINGA project to take an expansion strategy for maize iMSD in Central Sulawesi to both serve maize and paddy iMSDs in anticipation of the greater Palu/Sigi/Donggala Food Estate that likely to cover maize and paddy.

3. Given the relative higher adoption of horticulture intervention compared to the nutmeg intervention, for the iMSD intervention in North Maluku, we recommend either a consolidation strategy on nutmeg iMSD or a turnaround strategy from nutmeg to horticulture.

4. On pili nuts iMSD in Alor Island of East Nusa Tenggara, we recommend a consolidation strategy

Table 2. Landscape of National Agriculture Policy

		NATIONAL REGULATION							DATA		
		<i>The 2012 Food Law; The Cipta Karya Law</i>							<i>Does the commodity appear in:</i>		
		<i>Input subsidies or transfer for farmers groups</i>	<i>Presidential Special Efforts (2015-present)</i>	<i>Food Estate for outside Java (2019-present)</i>	<i>MoA Decree on Zonation (2018-present)</i>	<i>BUN500 for smallholders (2019-2024)</i>	<i>MoForestry regulation on NTFPs</i>	<i>Price regulation</i>	<i>Import/Export restriction</i>	<i>2013 Agriculture Census</i>	<i>2018 Village Potential Survey</i>
SUB-SECTOR	COMMODITY										
Food Plants	Rice	Seed, Chemical Fertilizers	Seed, Fertilizers, Machine, Water	Seed, Fertilizers, Machine, Water, Working capital	DAK Fund and program allocation	Not included	Not included	Subsidised input prices, Farm gate floor price for output	Yes, Import restriction	Yes	Yes, by name
	Maize	Seed, Chemical Fertilizers	Seed, Fertilizers, Machine, Water	Seed, Fertilizers, Machine, Water, Working capital	DAK Fund and program allocation	Not included	Not included	Subsidised input prices, Farm gate floor price for output	Yes, Import restriction	Yes	Yes, as Secondary crops
	Soybean	Not included	Seed, Fertilizers, Machine, Water	Not included	DAK Fund and program allocation	Not included	Not included	Price monitoring	No	Yes	Yes, as Secondary crops
	Tubers & roots	Not included	Not included	Not included	DAK Fund and program allocation	Not included	Not included	No	No	Yes	Yes, as Secondary crops
Horticulture	Onion	Seed, Chemical Fertilizers	Seed, Fertilizers, Machine, Water	Seed, Fertilizers, Machine, Water,	DAK Fund and program allocation	Not included	Not included	Price monitoring	No	Yes	Yes, as Horticulture

		NATIONAL REGULATION <i>The 2012 Food Law; The Cipta Karya Law</i>							DATA <i>Does the commodity appear in:</i>		
		<i>Input subsidies or transfer for farmers groups</i>	<i>Presidential Special Efforts (2015-present)</i>	<i>Food Estate for outside Java (2019-present)</i>	<i>MoA Decree on Zonation (2018-present)</i>	<i>BUN500 for smallholders (2019-2024)</i>	<i>MoForestry regulation on NTFPs</i>	<i>Price regulation</i>	<i>Import/Export restriction</i>	<i>2013 Agriculture Census</i>	<i>2018 Village Potential Survey</i>
SUB-SECTOR	COMMODITY										
				Working capital							
	Chili	Seed, Chemical Fertilizers	Seed, Fertilizers, Machine, Water	Seed, Fertilizers, Machine, Water, Working capital	DAK Fund and program allocation	Not included	Not included	Price monitoring	No	Yes	Yes, as Horticulture
	Fruit crops	Seed, Chemical Fertilizers	Not included	Seed, Fertilizers, Machine, Water, Working capital	DAK Fund and program allocation	Not included	Not included	No	No	Yes	Yes, as Horticulture
	Vegetable	Seed, Chemical Fertilizers	Not included	Seed, Fertilizers, Machine, Water, Working capital	DAK Fund and program allocation	Not included	Not included	No	No	Yes	Yes, as Horticulture
Estate Crops	Rubber	Seedling, Chemical Fertilizers	Not included	Candidate to be included	DAK Fund and program allocation	Seedling, Chemical Fertilizers	Not included	No	No	Yes	Yes, by name

		NATIONAL REGULATION <i>The 2012 Food Law; The Cipta Karya Law</i>								DATA <i>Does the commodity appear in:</i>	
		<i>Input subsidies or transfer for farmers groups</i>	<i>Presidential Special Efforts (2015-present)</i>	<i>Food Estate for outside Java (2019-present)</i>	<i>MoA Decree on Zonation (2018-present)</i>	<i>BUN500 for smallholders (2019-2024)</i>	<i>MoForestry regulation on NTFPs</i>	<i>Price regulation</i>	<i>Import/Export restriction</i>	<i>2013 Agriculture Census</i>	<i>2018 Village Potential Survey</i>
<i>SUB-SECTOR</i>	<i>COMMODITY</i>										
	Oil palm	Seedling, Chemical Fertilizers	Not included	Candidate to be included	DAK Fund and program allocation	Not included	Not included	Consumer ceiling price for non-branded palm oil	No	Yes	Yes, by name
	Coffee	Seedling, Chemical Fertilizers	Not included	Candidate to be included	DAK Fund and program allocation	Not included	Not included	No	No	Yes	Yes, by name
	Cacao	Seedling, Chemical Fertilizers	Not included	Candidate to be included	DAK Fund and program allocation	Seed, Chemical Fertilizers	Not included	No	No	Yes	Yes, by name
	Coconut	Seedling, Chemical Fertilizers	Not included	Candidate to be included	DAK Fund and program allocation	Seedling, Chemical Fertilizers	Not included	No	No	Yes	Yes, by name
	Pepper	Seedling, Chemical Fertilizers	Not included	Candidate to be included	DAK Fund and program allocation	Seedling, Chemical Fertilizers	Not included	No	No	Yes	Yes, by name
	Cloves	Seedling, Chemical Fertilizers	Not included	Candidate to be included	DAK Fund and program allocation	Seedling, Chemical Fertilizers	Not included	No	No	Yes	Yes, by name
	Tobacco	Seedling, Chemical Fertilizers	Not included	Candidate to be included	DAK Fund and program allocation	Seed, Chemical Fertilizers	Not included	No	No	Yes	Yes, by name

		NATIONAL REGULATION <i>The 2012 Food Law; The Cipta Karya Law</i>								DATA <i>Does the commodity appear in:</i>	
		<i>Input subsidies or transfer for farmers groups</i>	<i>Presidential Special Efforts (2015-present)</i>	<i>Food Estate for outside Java (2019-present)</i>	<i>MoA Decree on Zonation (2018-present)</i>	<i>BUN500 for smallholders (2019-2024)</i>	<i>MoForestry regulation on NTFPs</i>	<i>Price regulation</i>	<i>Import/Export restriction</i>	<i>2013 Agriculture Census</i>	<i>2018 Village Potential Survey</i>
<i>SUB-SECTOR</i>	<i>COMMODITY</i>										
	Sugarcane	Seedling, Chemical Fertilizers	Not included	Candidate to be included	DAK Fund and program allocation	Seedling, Chemical Fertilizers	Not included	Ceiling price for consumer	No	Yes	Yes, by name
	Nutmeg	Seedling, Chemical Fertilizers	Not included	Candidate to be included	DAK Fund and program allocation	Seedling, Chemical Fertilizers	Not included	No	No	Yes	Not mentioned
NTFPs	Honey	Not included	Not included	Not included	Not covered	Not included	Permission and post-harvest programs	No	No	Yes	Yes, as NTFPs group
	Pili nuts	Not included	Not included	Not included	Not covered	Not included	Permission and post-harvest programs	No	No	Yes	Not mentioned
	Tamarind	Not included	Not included	Not included	Not covered	Not included	Permission and post-harvest programs	No	No	Yes	Not mentioned
	Bamboo	Not included	Not included	Not included	Not covered	Not included	Permission and post-harvest programs	No	No	Yes	Not mentioned

		NATIONAL REGULATION <i>The 2012 Food Law; The Cipta Karya Law</i>								DATA <i>Does the commodity appear in:</i>	
		<i>Input subsidies or transfer for farmers groups</i>	<i>Presidential Special Efforts (2015-present)</i>	<i>Food Estate for outside Java (2019-present)</i>	<i>MoA Decree on Zonation (2018-present)</i>	<i>BUN500 for smallholders (2019-2024)</i>	<i>MoForestry regulation on NTFPs</i>	<i>Price regulation</i>	<i>Import/Export restriction</i>	<i>2013 Agriculture Census</i>	<i>2018 Village Potential Survey</i>
<i>SUB-SECTOR</i>	<i>COMMODITY</i>										
Livestock	Cattle	Adult animal for breeding; artificial insemination	Adult animal for breeding; artificial insemination	Not included	DAK Fund and program allocation	Not relevant	Not relevant	Price monitoring on beef	Yes	Yes	Yes, as Animal Husbandry
	Water Buffaloes	Adult animal for breeding; artificial insemination	Adult animal for breeding; artificial insemination	Not included	DAK Fund and program allocation	Not relevant	Not relevant	Indirect price monitoring on meat, as close substitute to beef	Yes except for frozen meat	Yes	Not mentioned
	Goat	Adult animal for breeding	Not included	Not included	DAK Fund and program allocation	Not relevant	Not relevant	No	No	Yes	Yes, as Animal Husbandry
	Chicken	Adult animal for breeding	Not included	Not included	DAK Fund and program allocation	Not relevant	Not relevant	Price monitoring on inputs (DOC, feed) and outputs (eggs, meat)	No	Yes	Yes, as Animal Husbandry
	Pig	Adult animal for breeding; artificial insemination	Not included	Not included	DAK Fund and program allocation	Not relevant	Not relevant	No	No	Yes	Not mentioned

Source: Authors analysis; fisheries sub-sector is excluded from the analysis because it is not covered in the MORINGA's project commodity set

Table 3. Priority Commodities according to Central Government Regulation

		PROVINCE & DISTRICT							
		East Nusa Tenggara				North Maluku		Central Sulawesi	
		Kupang	SC Timor	Belu	Alor	North Halmahera	Ternate	Sigi	Donggala
SUB-SECTOR	COMMODITY								
Food Plants	Rice	X	X	X	X	X	X	V	V
	Maize	V	V	V	X	V	X	V	X
	Soybean	V	X	X	X	X	X	V	X
	Tubers & roots	X	X	X	X	X	X	X	X
Horticulture	Onion	V	V	V	X	V	V	V	V
	Chili	V	V	V	X	X	V	V	V
	Garlic	X	V	V	X	X	X	V	V
	Manggoes	X	X	V	X	X	X	X	X
	Oranges	X	V	X	X	X	X	X	X
	Vegetables								
Estate Crops	Rubber	X	X	X	X	X	X	X	X
	Oil palm	X	X	X	X	X	X	X	X
	Coffee	X	X	X	V	X	X	X	X
	Cacao	X	X	X	V	X	X	V	V
	Coconut	V	X	X	X	V	X	X	X
	Pepper	X	X	X	X	X	X	X	X
	Cloves	X	X	X	X	V	X	X	X
	Tobacco	X	X	X	X	X	X	X	X
	Sugarcane	X	X	X	X	X	X	X	X
	Nutmeg	X	X	X	V	V	X	X	X
	Cashew	X	X	V	V	X	X	X	X
	Livestock	Cattle	V	V	V	X	V	X	V
Water Buffaloes		X	X	X	X	X	X	X	X
Goat		X	X	X	X	X	X	X	X
Chicken		X	X	X	X	X	X	X	X
Pig		X	X	X	X	X	X	X	X

Source: Author analysis from MoA Decree on Priority Commodities and Presidential Food Estate documents. No information on district level for NTFPs

Note: V National Priority V Food Estate V National Priority & Food Estate
V = Yes; X = No

Table 4. The relative importance of the six commodities being studied based on number of farmers

<i>Location</i>	<i>Number of Farmers by Commodity</i>			
A. Central Sulawesi	Plantation Crops (314 thousand)	Cattle (181 thousand)	Horticulture (123 thousand)	Rice (109 thousand); Secondary Food Crops including Maize (84 thousand)
A.1. Sigi	Plantation Crops (23 thousand)	Cattle (16,8 thousand)	Rice (16 thousand);	Horticulture (9,7 thousand); Secondary Food Crops including Maize (6,8 thousand)
A.2. Donggala	Cattle (17,5 thousand)	Horticulture (15,2 thousand)	Rice (9,5 thousand)	Secondary Food Crops including Maize (8,6 thousand)
B. North Maluku	Coconut (94 thousand)	Nutmeg (64 thousand)	Cloves (23 thousand)	Cocoa (10 thousand)
B.1. North Halmahera	Coconut (21 thousand)	Nutmeg (11 thousand)	Cloves (2,5 thousand)	Horticulture (1,9 thousand)
B.2. Ternate	Nutmeg (4,2 thousand)	Cloves (2,8 thousand)	Coconut (1,9 thousand)	Horticulture (1,2 thousand)
C. East Nusa Tenggara	Secondary Food Crops including Maize (237 thousand)	Rice (219 thousand)	Cattle (93 thousand)	Horticulture (40 thousand)
C.1. Kupang district	Secondary Food Crops including Maize (24 thousand)	Rice (16 thousand)	Cattle (10 thousand)	Horticulture (4.5 thousand)
C.2. Alor	Secondary Food Crops including Maize (10.9 thousand)	Plantation Crops (9.7 thousand)	Rice (4.7 thousand)	Horticulture (2.5 thousand)

Source: (1) TOR of MORINGA Policy Study; (2) 2018 Agriculture Intercensal Survey (SUTAS) Provincial Reports (BPS, 2018a; BPS, 2018b; BPS, 2018c)

Note: #Data from SUTAS 2018: Number of households Cultivation of forest crops (275); Other Forestry Enterprises (92)

References

- BPS (2013a) The Result of Agricultural Census 2013 Indonesia. Province. BPS, Jakarta. BPS
- (2013b) The Result of Agricultural Census 2013 Nusa Tenggara Timur Province. BPS, Kupang.
- BPS (2013c) The Result of Agricultural Census 2013 North Maluku Province. BPS, Ternate. BPS
- (2013d) The Result of Agricultural Census 2013 Central Sulawesi Province. BPS, Palu. BPS
- (2015) 2015 Labor Force Survey Micro Data, BPS, Jakarta.
- BPS (2018a) The Result of Inter-Census Agricultural Survey 2018 Nusa Tenggara Timur Province. BPS, Kupang.
- BPS (2018b) The Result of Inter-Census Agricultural Survey 2018 North Maluku Province. BPS, Ternate.
- BPS (2018c) The Result of Inter-Census Agricultural Survey 2018 Central Sulawesi Province. BPS, Palu.
- BPS (2019) *Karakteristik Rumah Tangga Menurut Status Kemiskinan 2018-2019* (Household Characteristics by Poverty Status 2018-2019) <https://www.bps.go.id/indicator/23/207/4/karakteristik-rumah-tangga-menurut-status-kemisikinan.html>.
- Freddy, Imelda Magdalena, and Gede Endy Kumara Gupta (2018) Strengthening Food Security Policy: Reforms on Hybrid Maize Seeds Delivery Mechanism. Center for Indonesian Policy Studies (CIPS), Jakarta.
- Freddy, Imelda Magdalena, Hizkia Respatiadi, and Gede Endy Kumara Gupta (2018) Reforming Trade Policy to Lower Maize Prices in Indonesia. Center for Indonesian Policy Studies (CIPS), Jakarta.
- Octania, Galuh (2021) The Government's Role in the Indonesian Rice Supply Chain. Center for Indonesian Policy Studies (CIPS), Jakarta.
- Respatiadi, Hizkia, and Hana Nabila (2017) Rice Policy Reform: Removing Restrictions on Rice Trade in Indonesia. Center for Indonesian Policy Studies (CIPS), Jakarta.