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STAKEHOLDER BRIEF

ACIAR Cassava Value Chain and Livelihood Program

Varieties in the Cassava Sector in Indonesia



Summary

Indonesia is one of the largest producers of fresh cassava roots in the world. However, Indonesia is also the world's second biggest importer of cassava starch. This highlights that Indonesian cassava production still cannot meet the demand of domestic cassava starch factories. Varieties of cassava in Indonesia include non-bitter varieties with low starch content for eating purposes and bitter varieties with high starch content that are preferred by the starch processing industry.

Field trials carried out in Simalungun district of North Sumatra Province and Sikka district of East Nusa Tenggara Province under the project AGB/2012/078 between 2015 and 2019 tested multiple cassava varieties developed by ILETRI and the University of Brawijaya Malang. In Simalungun the currently planted varieties are local bitter varieties that may have originated from the Adira variety, although farmers identify these as Malaysia varieties. In Sikka, the most common cassava varieties are Sikka Putih and Sikka Kuning, which also might originate from the Adira variety that was developed in East Nusa Tenggara in the 1990s.

Although the origin of cassava varieties was probably the same, in Simalungun the cassava has higher starch content and is thus preferred by the starch processing industry. In Sikka, both Sikka Putih and Sikka Kuning are used solely for food and animal feedstock. Results from trials and farmers' adoption in Simalungun showed that farmers preferred the Malang 4 variety, which has a high starch content and yield. In Sikka, farmers preferred Malang 6 and Gajah varieties, due to high yield and good taste. Many farmers have adopted these preferred varieties in Simalungun and Sikka since 2017.

Key policy recommendations are establishing the linkage between ILETRI, farmers, field extension officers, and the starch factory to increase the availability of preferred cassava varieties in Simalungun district. In the Sikka district, where cassava is still considered as a food source and animal feedstock, the non-bitter varieties are preferred by farmers. Local district government in Sikka could arrange support from ILETRI to increase the availability of preferred non-bitter cassava varieties to the farmers.

Background

Cassava farming in North Sumatra is predominately oriented towards production of feedstock for the starch industry. Farmers in North Sumatra prefer bitter cassava varieties with high yield and starch content. In contrast, cassava farming in East Nusa Tenggara is characterised by production for own consumption and for animal feed. Therefore, the cassava varieties preferred by farmers in East Nusa Tenggara are high yielding non-bitter varieties.

In Simalungun district farmers have planted varieties with high starch content, mainly the Malaysia and Adira varieties. However, the productivity of these varieties is relatively low. In Sikka district (East Nusa Tenggara Timur) farmers plant cassava for food and animal feed, but the non-bitter varieties they use still have relatively low yields. Farmers in both locations were invited to the field trials, and then adopted the preferred varieties to be planted in their field.

Key Issues

Low productivity: The household survey done in 2017 in both project sites showed that most farmers are planting the same varieties every year. In Simalungun, most of the farmers are planting the Malaysia variety, and the planting material is circulated between farmers in the farmers group. The starch factory is also working together with agents in order to help farmers get the cassava varieties that are needed. The



survey results showed that the average productivity of current varieties in Simalungun was around 20-30 tons per hectare. The average productivity of cassava farming in Sikka was exceptionally low, only around 10-15 ton per hectare.

Late maturity local varieties: In **Sikka** the local varieties (Sikka Putih and Kuning) both take a long time before they are able to be harvested. These local varieties, which might originate from Adira, (introduced in the 1990s) are only able to be harvested 12-13 months after planting, and in some cases even after 16 months. If farmers in Sikka want to increase the productivity of cassava production, then earlier harvesting and higher yielding cassava varieties are needed.

Diversity of varieties: In Simalungun, most of the cassava varieties planted by farmers are bitter and have a high starch content. These are not suitable for human consumption in the home as cooked tubers. Therefore, farmers do not have any alternative potential market for their fresh cassava if there is a decline in demand from the starch processing factory. To meet such an eventuality farmers would need access to

varieties that are more suitable for alternative uses. In Sikka, the cassava varieties planted are mainly for food and animal feed and have low starch content. In order to meet the demand from a possible starch factory in Sikka, farmers would need other varieties that have high yield and starch content.

Key relevant findings from research

Agronomic results and field analysis undertaken in both Simalungun and Sikka between 2017 and 2020 has consistently shown that introduced varieties were preferred by the farmers compared to the current varieties. Most of the farmers that were included in the adoption trial are willing to continue planting the introduced varieties (In Simalungun farmers prefer Malang 4 variety, while in Sikka farmers prefer Gajah, Tambak udang and Malang 4 varieties).

Agronomic Results

In **Simalungun**, 10 introduced varieties were compared with the current varieties planted by farmers (Adira-4 and Malaysia). The trials were conducted in farmer's field and in trial field, with planting density of 12500 Plants per hectare. Fresh root yield ranges from 20 to 50 tons per hectare across all varieties and locations. Fresh root yield from the Adira-4 was lower (28 tons per hectare) compared to the other varieties tested (20-40 tons per hectare). The maximum yield of 40 tons per hectare was achieved by the introduced variety (Malang 4), while the Malaysia variety achieved 30 tons per hectare. Based on the farmers preference on the physiology traits of cassava varieties, farmers preferred to plant Malang 4 in the 2017-2019 planting season. In the farmers field, average Malang 4 can achieve an average of 35 to 40 tons per hectare.

In **Sikka**, the local varieties (sikka putih and sikka kuning) are late maturing, and usually harvest between 12-16 months after planting. The average yield of the local varieties is around 10 to 15 tons per hectare, although this was achieved with wide planting spaces (2x2 m). Trials in 2016-2017 introduced 10 new varieties to be compared with the local varieties. Results showed that introduced varieties perform better than the local varieties. The maximum yield was obtained by the Gajah variety (56 tons per hectare) and Malang 4 (42 tons per hectare). The Tambak Udang variety yielded only 20 to 25 tons per hectare. Farmers that attended field trials and field days preferred Gajah and Malang 4 variety to be planted in their fields in the 2017-2019 planting seasons. In the farmers field, on average the Gajah variety can achieve around 35 to 40 tons per hectare, while the Malang 4 variety can achieve around 40 to 42 tons per hectare.



Recommendations based on research findings

Starch factories should invest more on ensuring availability of desirable varieties to farmers: The results from trial and farmers adoption surveys showed that both in Simalungun and Sikka the Malang 4 varieties perform well in term of giving a higher yield compared to local varieties. Moreover, the starch content is also comparable to the local varieties. Hence, factories would find it beneficial to collaborate with ILETRI to ensure availability and support distribution of Malang 4 varieties to farmers. In Sikka, there is a high potential for scaling up cassava farming due to the availability of land and farmer eagerness to plant cassava. The local government then should communicate the needs of preferred cassava varieties (either for eating or as inputs for starch or animal feed production) to ILETRI.

Multiple cassava varieties are best practice for farmers: Farmers should plant multiple varieties of cassava, not only the high starch content bitter varieties but also the non-bitter varieties for consumption. In Sikka, cassava is one of the major staple foods for daily consumption. Thus, if cassava farming is scaled up in the future, farmers should continue to plant eating varieties in addition to bitter cassava for industry. In Simalungun, planting eating varieties in addition to the existing production of bitter varieties will give farmers an option to produce cassava based food when the price of cassava for starch is low.

This stakeholder brief summarises issues, findings and key policy recommendations related to variety use in the cassava sector in Indonesia from ACIAR Project AGB/2012/078 *Developing value-chain linkages to enhance the adoption of profitable and sustainable cassava production systems in Vietnam and Indonesia*.

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