

Indonesia: Government Ownership From the Start

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Biofortified crops with value chain activities: **Zinc Rice**



Released biofortified crops with no value chain activities: **Vitamin A Orange Sweet Potato**

Biofortified zinc rice varieties currently available in Indonesia

1. **Inpari IR Nutrizinc** for wetland, released in 2019
2. **Fortiz13** for dryland, released in 2020

Zinc rice delivery model: Steps and activities

This work is funded by the Indonesian Government through the Scale Up Biofortified Crops program. The program is part of the National Medium-Term Development Planning 2020-2024 (RPJMN 2020-2024).

Activities:

- Planting zinc rice varieties with an agro-input subsidy as an incentive for zinc rice farmers. Focus is on large-scale central production of rice, and in areas with high rates of stunting. Coordinated by the Ministry of Agriculture.
- Distribute zinc rice in the Social Safety Net-BPNT Program, particularly in areas with high stunting rates. Coordinated by the Ministry of Social Affairs.

Table 1. Planting and distribution plan for high zinc rice program (RPJMN 2020-2024)

	2020	2021	2022	2023	2024
Planting area (Ha)	10,000	50,000	100,000	150,000	200,000
Target for % biofortified rice distribution in SSN program (BPNT)*	20	40	60	80	100

* about 2,25 Mln metric tons annually



Commercial Value Chain Activities for Zinc Rice

1. Agricultural research: breeding pipeline

- Improvement of quality of current zinc rice (increase yield; increase grain size).
- Development of zinc + iron rice variety.
- Intercropping zinc rice (Fortiz13) with young oil palm to support food security.

2. Seed and vine release

- Zinc rice (Nutrizinc and Foriz13).
- Vitamin A orange sweet potato.

3. Commercial seed production

- Zinc rice seed is mainly produced to support the government program.
- The data for volume of rice seed available on the free market is currently being collected.

4a. Farming/growing

- No difference in farming practices between biofortified rice and non-biofortified rice.
- Pros and cons of additional fertilizer to increase zinc content are under discussion.

4b. Fertilizers and agronomic biofortification (including scope or demand)

- Zinc fertilizers could increase zinc content in grain, however for sustainability reasons the focus is on introducing biofortified varieties.

5. Aggregation

- Aggregators usually pay a lower price for zinc rice because the current variety (Nutrizinc) has smaller grain size compared to other common varieties.
- Aggregators mixed zinc rice grain with other varieties.

6. Milling

- Most rice millers mixed biofortified rice with common varieties. This is due to no additional market value and no demand from consumers for biofortified rice.

7. Processing

- No specific treatment of biofortified rice in processing. Most is mixed with other varieties.

8 a. Retailing

- Zinc rice is currently not labelled as biofortified rice in the market.
- Retailers do not see additional value to label biofortified rice due to no price differential and no demand.

8b. Public procurement (schools, hospitals, safety net schemes)

- BPNT, a social safety net program, is expected to purchase biofortified rice as stated in RPJMN. However, at this stage the realization is very low, only in a few areas and at low volumes.
- This is due to no public awareness efforts to educate consumers about the health benefits of biofortified rice consumption. There is no demand creation as well as no support from local government.

9a. Consumption on farm

- Most of the farmers' families consume zinc rice from their own farms.

9b. Commercial food consumption (by the entire population)

- Usually about 50% of the harvested grain is sold to market. However, consumers do not know about biofortified rice, or they do not consume zinc rice intentionally, without knowing the benefits of biofortified rice.

Non-commercial value chains, conflict, or fragile environments

Currently all activities in Indonesia are based on commercial demand and supply. Even the inclusion in social safety net programs relies on commercial transactions. It is recommended to maintain efforts in commercial production and ensure a sustainable supply chain in the long term.

Other agricultural activities and points of consideration

Promotion of agrobiodiversity

- Promote biofortified rice as an intercropping element in young oil palm plantations (or other plantation crops). Advise policymakers and funders about considering this as a support to food security, and as an income generator for planters during the first three years before the palm trees produce fruits to harvest.

Soil health monitoring and improvement

- Farmer Field School activities or other capacity building measures managed by government and other development organizations usually cover soil nutrient management.

Policy, advocacy, and enabling activities for zinc rice

Activity	Summary
Government advocacy and engagements	<ul style="list-style-type: none"> Need to support (coordinate) the implementation of RPJMN, especially in planting and distribution of biofortified rice.
Policy inclusion (list all relevant policies agriculture and nutrition)	<ul style="list-style-type: none"> RPJMN 2020-2024. Specialty rice specification (higher price) for healthy rice.
Standards and regulations	<ul style="list-style-type: none"> Standards, traceability mechanisms, labelling, registration, etc. do not currently exist. Need technical assistance for policymakers in these areas.
Market research	<ul style="list-style-type: none"> Not available for biofortified rice.
Technology advancements	<ul style="list-style-type: none"> Biofortification through fertilizer e.g. foliar fertilizer NP + zinc, is proven to increase zinc content. Pros and cons for sustainability reasons.
Data collection	<ul style="list-style-type: none"> No proper data available. Need a good data collection tool, e.g. to use a digital platform to support all supply chain activities (farm to market).
Gender and inclusivity	<ul style="list-style-type: none"> No specific gender approach at the moment. Need to promote Nutrition Sensitive Agriculture as part of the Farmer Field School module to MOA.

Monitoring and evaluation, reach in 2022

Seed volumes 2,500 metric tons (to support a 100,000 Ha planting program)	Grain volumes 550,000 MT paddy or 302,500 MT grain rice	Food products commercial Not currently measured
Market share 0.008% (based on an estimated 300,000MT of seed required to cover the total planting area of 12,000,000)	Market share Not currently measured	Food products institutional Not currently measured

Consumer reach

	Current 2021 figures	Target by 2030
Households growing	<ul style="list-style-type: none"> 400,000 farmers (@farmer has 5 family members) 	To be determined based on level of investment
Off farm consumption	<ul style="list-style-type: none"> 2,520,833 people (@ 120 kg rice per year) 	To be determined based on level of investment
Institutional consumption	<ul style="list-style-type: none"> Social safety net (BPNT program) Government staff rice subsidy Hospitals Boarding schools 	To be determined based on level of investment

SWOT analysis summary

Strength	Weaknesses
<ul style="list-style-type: none"> Strong support from MOA for biofortified rice planting program. Farmers are familiar with the production technology of biofortified rice. No significant additional cost to produce biofortified rice. 	<ul style="list-style-type: none"> Farmers do not have enough knowledge on the health benefits of growing biofortified rice. No standard and regulation on registration, or traceability mechanism and labelling. No proper database (farmers and farms). No marketing and promotion strategy.
Opportunities	Threats
<ul style="list-style-type: none"> Strong support and commitment from central government in nutrition and health improvement, especially against stunting. Potential captive market in social safety net (BPNT program). Digital technology is available in many forms to use for multiple purposes, e.g. public awareness, marketing, database, traceability, etc. Livelihoods and income are increased through involvement in biofortification. 	<ul style="list-style-type: none"> Lack of coordination among related ministries. WFP and DSM (and other private sector actors) are very active in promoting post-harvest fortified rice.

About the Author:

Sulaiman Ginting leads the HarvestPlus program in Indonesia. He is a technical advisor and project manager with 15 years of experience in the agri-food sector. His expertise is on sustainable agri-food systems, especially on the rice value chain and rice fortification. Prior to HarvestPlus, Sulaiman worked with the German International Cooperation (GIZ) for more than 10 years in various agricultural programs. His latest position with GIZ was Project Manager for Better Rice Initiative Asia (BRIA – GIZ Indonesia), a public-private partnership project in promoting sustainable rice production as well as highly nutritious rice. In Indonesia, HarvestPlus is working on a national standard for zinc rice and guidelines for registration of zinc rice as a specialty rice, with the aim of generating better value for zinc rice and increase profits for farmers.

These case studies were developed in collaboration with the FAO as part of a Letter of Agreement to create “Guidance and tools to promote nutrient enriched crops as part of healthy diets to address micronutrient deficiencies in vulnerable rural communities”