

TO OVERCOME ZINC DEFICIENCY, WE MUST LEVERAGE BIOFORTIFIED RICE IN BANGLADESH



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KEY MESSAGES

- Too many people across Bangladesh are living with zinc deficiency. One proven and effective way to tackle this is through scaling up production and consumption of **rice biofortified with zinc**.
- Major **barriers to scale-up** of biofortified zinc rice include a lack of readily available seed; a lack of demand among aggregators, millers, and consumers; and a lack of differentiated marketing for zinc rice, which makes it difficult for consumers to choose biofortified zinc rice.
- Overcoming these barriers requires **interventions along the supply chain**. Actions are needed from both **government** and the **private sector** – for instance to use public procurement, incentives for aggregators and millers, and branding to promote availability and accessibility.

ZINC DEFICIENCY IS A CRITICAL PROBLEM IN BANGLADESH

While the nutrition situation in Bangladesh has improved over the last few decades, micronutrient deficiencies (or hidden hunger) remain common¹, with zinc deficiency highly prevalent. Zinc plays a critical role in food intake regulation, nutrient metabolism, protein synthesis, growth, and development, as well as immune system functioning – meaning people deficient in zinc are more likely to fall ill. Rising carbon dioxide levels are also driving a decline in zinc availability in key food crops, with zinc deficiency predicted to rise for this reason².

BIOFORTIFIED ZINC RICE IS A RECOGNIZED PART OF THE SOLUTION

Three complementary approaches can optimise a person's nutrient intake: 1) dietary diversity, 2) supplementation, and 3) fortification. Here we focus on the potential of biofortification, one form of fortification, as a key part of the solution to zinc deficiency in Bangladesh. Biofortification refers to the process of increasing the nutrient content and/or bioavailability of nutrients (that is, the ability of the body to absorb them) in crops through classical plant breeding techniques.

Since rice is the main staple food for people in Bangladesh, biofortification of rice with zinc is one of the best options for tackling zinc deficiency. Peer reviewed research confirms that biofortified crop consumption improves micronutrient intake and status³. Moreover, the impacts are biggest for the most micronutrient-deficient individuals. Zinc rice has additional nutritional value and does not change in color, taste, or odor after cooking, so it is well accepted by consumers.

Unfortunately, several challenges have so far prevented biofortified zinc rice from reaching its full potential.

¹ National Micronutrient Status Survey 2011-2012

² Smith MR, Myers, SS. Impact of anthropogenic CO2 emissions on global human nutrition. *Nature Climate Change*. 2018 August 27; Volume 8: 834–839 (<https://doi.org/10.1038/s41558-018-0253-3>)

³ La Frano MR, de Moura FF, Boy E et al. Bioavailability of iron, zinc, and provitamin A carotenoids in biofortified staple crops. *Nutrition reviews*. 2014 may; 72(5):289-307.

OVERCOMING THE CHALLENGES

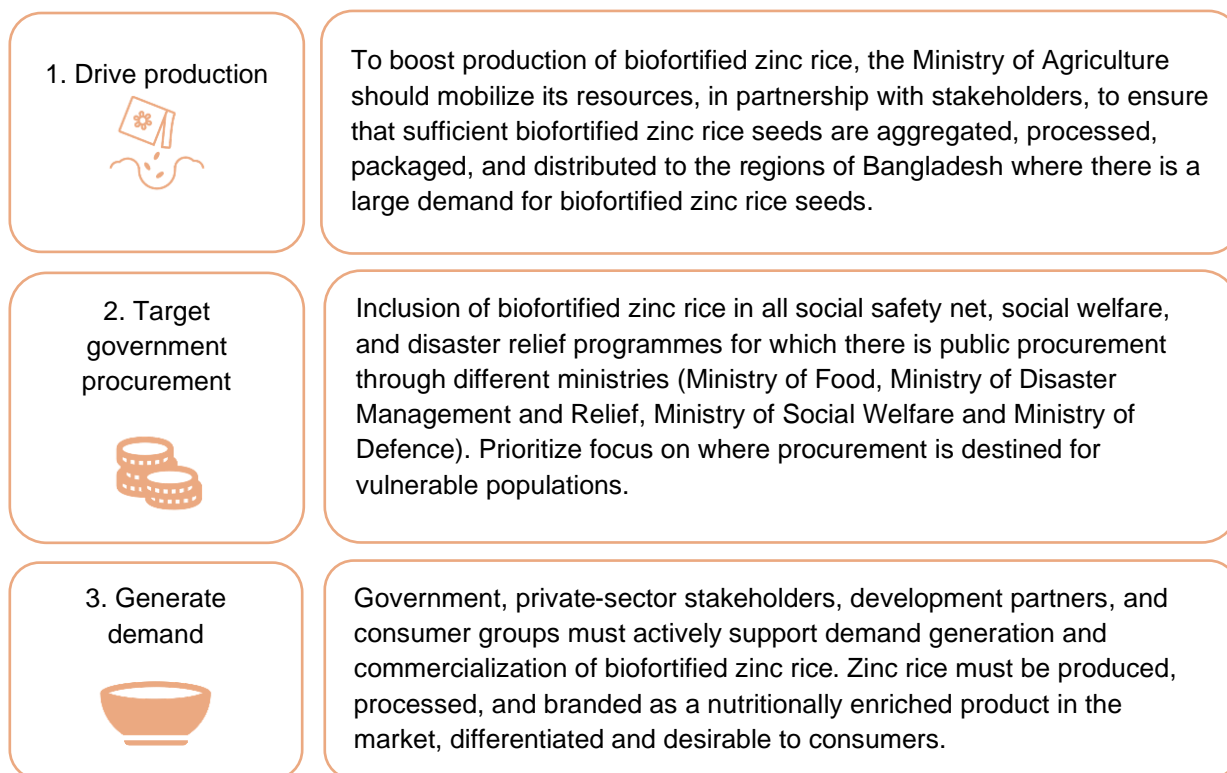
Despite its recognised potential, not enough biofortified seed is available in the market, and current production of zinc rice remains small scale and scattered. Total estimated rice production in Bangladesh in 2021 was around 35.5 million tonnes⁴; of this, only about 1% was zinc rice.

Moreover, once biofortified zinc rice is harvested, it is not aggregated, segregated, and marketed as a separate zinc rice product. Most of the biofortified zinc rice gets mixed with other varieties of rice, which makes it difficult for consumers to choose biofortified zinc rice.

To increase the production of biofortified zinc rice, first the seed needs to be sufficient and available. Farmers will be willing to produce more biofortified zinc rice if aggregators or millers demand these varieties. Aggregators and millers can in turn be incentivized to segregate biofortified zinc rice so that it can be sold as high-nutrient rice in the market, possibly attracting a price premium or greater demand from consumers.

To inspire action from these stakeholders, the Government of Bangladesh, development partners, NGOs, and the private sector have roles to play – see Figure 1.

Figure 1: Roles for key stakeholders



A CALL TO ACTION

Biofortification of staple foods is a proven, affordable, and sustainable way to reduce micronutrient deficiencies, especially among vulnerable groups. In Bangladesh, the full potential of biofortified zinc rice will be realized when biofortified varieties account for a meaningful percentage of total staple food production and consumption. This will contribute to the government's vision for growth and development, as the country will only thrive when its population is well nourished.

⁴ Rice Outlook, USDA, December 2021: <https://www.ers.usda.gov/webdocs/outlooks/102857/rcs-21k.pdf?v=9801.4>