



AGRICULTURAL PRODUCTIVITY PROGRAMME FOR SOUTHERN AFRICA (APPSA)



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FIGHTING MALNUTRITION WITH BIOFORTIFIED BEANS

▶ BACKGROUND

According to the 2017 Nutrition in the WHO African Region report, the prevalence of malnutrition in Malawi, Mozambique and Zambia is very high, and this has been attributed in part to limited dietary diversity. The report further states that the proportion of undernourished people in these countries is estimated at around 40% of the population, with the most common form of undernourishment being micronutrient deficiency, especially Iron (Fe), Zinc (Zn) and vitamin A. The proportion of children under five who are stunted

is estimated at 40%, underweight and wasting at 15% and 6%, respectively, which in part are attributed to micronutrient deficiencies. Iron and Zn deficiency results in reduced cognitive development, anaemia or even death.



The cost of addressing micronutrient deficiencies in the three countries is huge, in Zambia alone about US\$ 186 million is spent annually (World Bank, 2011).

Typically, nutrition has been portrayed as a health issue while hunger has largely been viewed as an agricultural issue. This has resulted in a disjoint between agriculture and health interventions aimed at improving nutrition or alleviating hunger. In

this regard, agricultural research and development in Malawi, Mozambique and Zambia has focused on development of improved production technologies to alleviate malnutrition. Taking

cognisance of the disjoint in fighting malnutrition and the high prevalence of micronutrient deficiency, the three countries are working in collaboration under the Agricultural Productivity Programme for Southern Africa (APPSA) to develop biofortified micronutrient rich crop varieties where

Zambia is the Regional Centre of Leadership (RCoL) for legumes and legumes based cropping systems.

▶ WHY BIOFORTIFICATION?

Biofortification is a process of increasing the density of vitamins and minerals in a crop through plant breeding or agronomic practices. It is an agricultural intervention meant to address

vitamin and minerals deficiencies. Biofortification is a pro-poor technology as staple crops that are consumed daily and constitute a large proportion of diets of poor households can be targeted. Biofortification has the potential to reach vulnerable populations in remote areas that do not have access to commercially marketed fortified foods, and are more likely to be missed by public supplementation programs. Once biofortified crop varieties have been adopted by farmers, provided planting material is accessible, the varieties can be grown and consumed for years at low recurring cost. However, for farmers to adopt biofortified crop varieties, there is need to have incentives that are superior to those realised from growing unfortified crop varieties.

Currently, Malawi, Mozambique and Zambia use two main approaches in addressing micronutrient deficiencies, namely; commercial fortification of food and nutrient supplements. Biofortification provides a third option to address hidden hunger which is cost-effective, sustainable and with high

outreach. Biofortification of beans in the three countries is being implemented through the breeding of bean varieties with high density of Fe and Zn, and also with resistance to Angular Leaf Spot and Common Bacteria Blight. The targeted beneficiaries of the project are the pregnant and lactating women, children under five years, smallholder farmers (also as ultimate consumers), seed companies and non-governmental organisations.

Currently, there are few bean varieties on the market with Fe and Zn density over 90 and 40 parts per million (ppm), respectively. The first generation biofortified beans which were used as parents are NUA 35, NUA 45 and NUA 5. Some of the lines earmarked for release in Malawi and Zambia are CIM ALS-FeZn08-16-6 and CIM-CBB-FeZn08-30-2, while Mozambique released four. The Fe and Zn density in these varieties is double that of non-biofortified varieties. To achieve increased access to bio-fortified bean varieties, Malawi, Mozambique and Zambia, through APPSA, produced biofortified beans

and distributed them to farmers



through a network of farmer's cooperatives, seed grower associations, farmer groups as well as individual farmers to make the varieties available at community level.

▶ CHALLENGES IN SCALING UP BIOFORTIFICATION

While biofortification has



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POLICY BRIEF

advantages over other interventions to alleviate micronutrient deficiencies, the growth of research into the bio-fortified crop breeding and utilisation of these crops in diets in Malawi, Mozambique and Zambia has been slow due to the following challenges:

- Poor funding in bio-fortified crop breeding by both public and private institutions.
- Lack of awareness on the advantages of consuming bio-fortified crops which has resulted into low consumer and market demand.
- Integration of bio-fortified crops into private sector programmes and investments has not taken effect.
- Institutional disconnect between agriculture and health interventions in addressing malnutrition. Key nutritional messages have been slow to incorporate the consumption of bio-fortified food crops.
- Inadequate studies on bio-availability of micronutrients when biofortified crops are consumed.
- Misconceptions amongst consumers on biofortification and genetically modified organisms (GMOs)

CONCLUSION

Biofortification provides the most cost effective and sustainable intervention to address micronutrient deficiency malnutrition in Malawi, Mozambique and Zambia compared to commercial fortification and nutrient supplements. The current interventions aimed at reducing micronutrient deficiencies should continue and strive to have an integrated approach that combines the use of biofortified food crops in diets.

POLICY RECOMMENDATIONS

- Integration of biofortification



plant breeding into mainstream public agriculture research, coupled with dedicated public and private sector financing to bio-fortified crop breeding and research.

- Strengthen seed systems to enhance seed multiplication in order to meet demand for biofortified bean seeds.
- Procurement of strategic food reserves should include bio-fortified food crops.
- Development and implementation of a behavioural change communication strategy targeted at increasing consumer awareness and demand for bio-fortified food crops.
- Development of an institutional frame work for coordination in the fight against malnutrition in Malawi,

Mozambique and Zambia.

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