POSITION PAPER ON THE INCLUSION OF BIOFORTIFIED CROPS IN GOVERNMENT'S INPUT SUPPORT PROGRAMS

Zimbabwe Government
HarvestPlus Better Crops • Better Nutrition
IAPRI Indaba Agricultural Policy Research Institute
Food and Agriculture Organization of the United Nations
UKaid from the British people

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About LFSP: The Zimbabwe Livelihoods and Food Security Programme (LFSP), Agriculture Productivity and Nutrition Component (APN) is managed by the Food and Agriculture Organisation of the United Nations (FAO), with the aim of contribute to poverty reduction through increased incomes for a target 250,000 smallholder farming households. The programme is being implemented in four provinces covering 12 districts as follows: Mutasa, Mutare, and Makoni in Manicaland; Guruve, Bindura, Mazowe and Mt Darwin in Mashonaland Central; Kwekwe, Gokwe North, Gokwe South and Shurugwi in Midlands and Zvimba in Mashonaland West provinces. FAO is in partnership with three NGO consortia led by Practical Action, Welthungerhilfe and World Vision International, two Strategic Technical partners i.e. IAPRI for policy influence, HarvestPlus for biofortification, three Commercial Banks, 1 Wholesale Facility - the Zimbabwe Microfinance Fund (ZMF), 5 Microfinance Institutions (MFIs) and the USAID managed DCA Facility. To date the LFSP is funded for two phases to the tune of £72.4m.

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Access to quality seed of the appropriate crops and varieties that are nutrient dense, high yielding and drought tolerant is a key pillar for food and nutrition security. Government input support programs play a critical role in ensuring food self-sufficiency by distributing seeds and fertilizer to rural households across the country. The nutritional sensitivity of the input support programs can be improved through the inclusion of seed of nutrient dense crops, such as vitamin A biofortified maize (orange maize) and iron biofortified beans in the input support package.

Background

Vitamin and mineral deficiencies, also known as micronutrient malnutrition / hidden hunger is a problem of public health significance in Zimbabwe and costs the country an estimated US$24 million in GDP annually. According to the Ministry of Health and Childcare (MoHCC), 26% of children aged 6 – 59 months suffer from stunting, 23% have Vitamin A deficiency, while 72% suffer from iron deficiency. Also according to the MoHCC, 19% of women of childbearing age suffer from Vitamin A deficiency, while 69% suffer from iron deficiency. Children who suffer from hidden hunger have impaired physical and mental development, and a higher chance of falling severely ill or even dying from common childhood infections such as malaria, measles, diarrhea etc. Micronutrient malnutrition in pregnant women increases the likelihood of adverse pregnancy outcomes such as perinatal mortality, low birthweight, premature birth, and maternal mortality.

Consequences of Vitamin A and Iron deficiency

Vitamin A deficiency is, according to the World Health Organization (WHO), the leading cause of preventable blindness in children and women. It is also a significant contributor to impaired growth and development in children. Children who suffer from vitamin A deficiency also have a weakened immune system, and therefore have a 25% greater risk of becoming severely ill and dying from common childhood diseases such as measles, malaria, or diarrhea compared to those without VAD.

Iron deficiency in infants and children results in impaired mental development, which leads to reduced cognitive abilities and learning difficulties while in adults it also leads to increased fatigue and weakness thus reducing economic productivity. Iron deficiency in women, especially during pregnancy is associated with adverse outcomes for both infant and mother including perinatal mortality, low birthweight, premature birth, and maternal mortality. According to the WHO, Iron deficiency anemia contributes to an estimated 115,000 maternal deaths/ year worldwide.

How nutrition sensitive agriculture can solve the problem of hidden hunger

The main cause of micronutrient malnutrition is inadequate dietary intake of vitamins and minerals, a problem that is solvable through nutrition sensitive agriculture. The Government of Zimbabwe through the MoHCC has implemented several complementary strategies to curb micronutrient malnutrition, the main ones being industrial food fortification, free distribution of micronutrient supplements and biofortification. Biofortification is the breeding of staple crops to contain high levels of key micronutrients such as vitamin A, iron and zinc without compromising on yield and other farmer desired crop traits. It is a sustainable and cost-effective solution to hidden hunger since all it takes is a once-off investment into breeding nutrient dense staples, after which no added costs are incurred except that of seed production and distribution, which costs are not any different from those for non-biofortified maize.

Government, through the department of Research and Specialist Services (DR&SS) under the Ministry of Lands, Agriculture, Fisheries, Water, and Rural Resettlement (MLAFWRR) already has an active breeding program for biofortified crops. To date, DR&SS has released 5 vitamin A maize (orange maize) varieties, 2 iron bean varieties and is in the process of releasing 2 vitamin A sweet potato varieties (orange fleshed sweet potato). DR&SS licensed these varieties to private seed companies who are producing and marketing seed of biofortified varieties to farmers across the country. Farmers have accepted the biofortified varieties for their nutritional content, agronomic performance and taste.

The value chain for biofortified crops is however still developing with the demand for biofortified seed currently above supply. Seed companies are willing to upscale production, provided they have as ready a market for orange maize seed and they do for white maize through government input support programs. The integration of biofortified maize and beans into government input support programs can therefore act as a strong pull for increased investment into orange maize seed production.

Summary

1. Staples are the foundation of all diets, and are particularly dominant in diets of the poor.
2. The micronutrient content of the staple crop varieties currently grown in most of the world is however inherently low in key micronutrients such as iron, zinc and vitamin A.

3. In the past decade, the micronutrient status of most cereals has ben improved through biofortification, a non-GMO based breeding technique that takes advantage of the natural diversity in the crop germplasm to develop varieties that biofortify themselves by accumulation high levels of these key micronutrients in their edible parts.

4. Research has proved that the regular consumption of biofortified varieties can make a significant difference in the micronutrient status of the nation especially the future foundations of the nation, that is, children and women of childbearing age.

5. The biofortified varieties that are currently available in Zimbabwe are orange maize, orange-fleshed sweet potato and iron beans; all of which are medium maturing, drought tolerant, and have yields that are comparable to those of non-biofortified varieties in the same maturity group.

6. Biofortified varieties offer the opportunity for a more nutritious food system in Zimbabwe, which can contribute to lowered levels of micronutrient deficiencies and expected improvements in other forms of malnutrition such as stunting.

7. The current capacity for the supply of biofortified seed is 100 MT for VAM, 400MT for HIB and 4 million OFSP vines. This is based on current seed projections less what the seed companies will need to sell in the open market. The projected growth in supply, based on past trends would be 75% for VAM, 100% for HIB and 100% for OFSP, although actual growth in supply may be much higher as seed companies respond to demand from government. Beneficiaries that could be initially targeted by the Presidential Input Scheme based on these capacities are as follows: 20,000 farming households would be reached with VAM seed (assuming each household receives 5kg pack); 400,000 households would be reached with HIB (assuming each household receives 1kg seed pack); and 12,000 households would be reached with OFSP vines (assuming that 33,000 OFSP vines would cover a hectare and each household would receive vines to cover 0.01ha). In the second year, households that would be reached with VAM and HIB seed and OFSP vines would be a minimum of 35,000, 800,000 and 24,000 respectively.

8. On the other hand, the exclusion of biofortified crops from Government Inputs support Schemes will distort the market against them, thus limiting their uptake, since most farmers rely on government for the supply of seed of the staple maize. This would delay a transition to a more nutritious food system in Zimbabwe.

9. At a macroeconomic level, the incorporation of biofortified maize and beans in input distribution programs will reduce Treasury's expenditures on micronutrient deficiency induced and /or enhanced illnesses.

Case study: The Zambian government recognized the importance of biofortified crops such that it integrated biofortification into the National Food and Nutrition Strategic Plan and the Farmer Input Support Program (FISP). The FISP, is contributing to the improvement of the supply and delivery of agricultural inputs to small-scale farmers through sustainable private sector participation, and it is also ensuring timely access to inputs (including biofortified seed) by smallholder farmers and promoting agricultural diversification. In addition, during the 2020 harvest season, the Ministry of Agriculture with support from HarvestPlus identified farming area planted and farmers' expected yields of vitamin A maize. This information was then shared with crop processors so they could prepare for the procurement process and arrange for special transport.