Innovative Methods and Metrics for Agriculture and Nutrition Actions

Policy Briefing Note

February 26, 2024

Coverage of iron-biofortified beans and influencing factors in the Northern Province of Rwanda

KEY MESSAGES

- There is high awarness of IBBs among respondents, but the consumption of IBBs remains low.
- Cultivation of IBBs appears to be driven mainly by market value of IBBs and their economic benefits, rather than nutritional benefits.
- Farmers cultivate IBBs and conventional beans concurrently with different purposes. Conventional beans are cultivated mainly for home consumption while IBBs are cultivated for income generation.

RATIONALE

Biofortification is regarded as an innovative, scalable, and cost-effective food-based strategy to address micronutrients deficiencies, especially in rural areas of developing countries where micronutrient deficiencies are highly prevalent and populations have limited access to diversified diets and commercially fortified foods[1]. Efficacy trials have demonstrated that consumption of biofortified crops increases the micronutrient status of women and children[2, 3].

Biofortification has been adopted by many governments as one of several key strategies for addressing micronutrient deficiencies. However, there are still limited data on coverage of biofortified foods that can help track the progress of biofortification program implementation. Given that, in many countries, biofortified crops are relatively new to both farmers and consumers[4]. Since biofortification indicators have not been integrated into existing national-level data collection systems[5], research is needed to fill this gap while generating data that can inform the decisions to scale-up biofortification programs.

We present findings from a study that was conducted to assess household-level coverage of iron-biofortified beans (IBBs) in the Northern Province of Rwanda. The findings were complemented by results from qualitative interviews with key informants, including farmers, bean vendors, and local leaders on their perceptions about factors influencing availability and consumption of IBBs.

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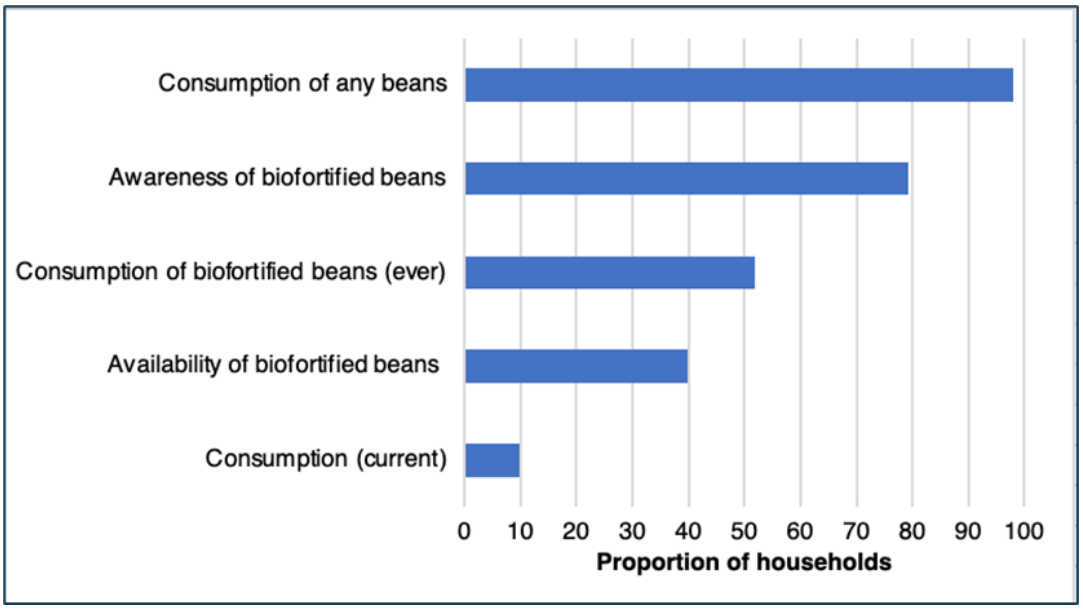
SURVEY RESULTS

- The results of the cross-sectional survey are displayed in the figure on the right.
- The figure shows the proportion of households consuming beans of any kind; who were aware of IBBs; who had ever consumed IBBs; who can access IBBs; and who currently consume IBBs.
- Sample included 535 households



RECOMMENDATIONS

- The IBBs seed supply chain must be strengthened to ensure availability of IBBs seeds and widespread adoption of IBBs.
- Efforts to support and encourage farmers to grow IBBs and to ensure availability of these beans should be coupled with interventions to also enhance people's awareness of the health and nutritional benefits of consuming IBBs.
- Information on the extent of biofortified crops in Rwanda has been scarce. This data gap can be addressed by integrating biofortification data into existing national-level data collection systems (e.g. National Agriculture Surveys).

METHODS AND FINDINGS

Methodology

This analysis was conducted using a cross-sectional survey. Data were collected on the following five indicators of coverage of IBBs: 1) consumption of beans in any form; 2) awareness of IBBs; 3) availability of IBBs; 4) consumption of IBBs (ever); and 5) consumption of IBBs (current). Qualitative interviews with key informants were also conducted to gather data on perceptions about factors influencing availability and consumption of IBBs. Descriptive statistics were performed to analyze quantitive data while thematic analysis was used to identify patterns in qualitative data.

Findings

Of the 535 households surveyed, 98% reported consuming beans (in any form) and 79% of respondents were aware of IBBs. Despite high consumption of beans and awareness of IBBs, just over half (51.9%) of the households reported ever consuming IBBs while only about 10% of the households had consumed IBBs in the past 7 days of the survey. Among the 321 households that provided bean samples, only 40% of the samples were biofortified.

Qualitative results indicated that many respondents perceived the unavailability of IBBs seeds as one of the constraints for IBBs adoption, which limits IBBs availability. Results also showed that IBBs fetch relatively higher market values compared to non-biofortified beans. Thus, the high market value and economic profitability of IBBs, rather than nutritional benefits, appear to be the most important incentives for farmers to grow IBBs. Farmers grow conventional beans and IBBs concurrently and for different purposes. IBBs are grown to generate income while local bean varieties are cultivated for home consumption.

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Next steps

The findings from this research will be shared with key stakeholders, including government agencies such as the Rwanda Agriculture Board (RAB) who are involved in biofortification program implementation.

The findings will be used to inform an ongoing collaborative project which aims to advocate for increased demand and consumption of healthy and sustainable foods. The project has already identified school feeding programs as one of the entry points to scale-up the consumption of IBBs.

ACKNOWLEDGEMENTS

We thank all study participants for their valuable time and for sharing their experiences.

I am grateful to IMMANA team, including Prof William Masters, Julia Matteson, and Alex Knueppel of Tufts University for the support during the entire fellowship period and my mentors Prof Jones Andy and Hilda Vasanthakaalam.

This work was funded through the Innovative Methods and Metrics for Agriculture and Nutrition Actions (IMMANA) Fellowship programme. IMMANA is cofunded with UK Aid from the UK government and the Bill & Melinda Gates Foundation, facilitated by the London School of Tropical Hygiene and Medicine (LSHTM).

REFERENCES

1. J.V. Meenakshi, N.L. Johnson, V.M. Manyong, H. DeGroote, J. Javelosa, D.R. Yanggen, et al., How cost-effective is biofortification in combating micronutrient malnutrition? An ex-ante assessment, World Dev. 38 (1) (2010) 64–75, https://doi.org/10.1016/j.worlddev.2009.03.014.
2. H.E. Bouis, A. Saltzman, Improving nutrition through biofortification: a review of evidence from HarvestPlus, 2003 through 2016, Glob. Food Sec. 12 (2017) 49–58, https://doi.org/10.1016/j.gfs.2017.01.009.
3. J.D. Haas, S.V. Luna, M.G. Lung'aho, M.J. Wenger, L.E. Murray-Kolb, S. Beebe, et al., Consuming iron biofortified beans increases iron status in Rwandan women after 128 days in a randomized controlled feeding trial, J. Nutr. 146 (8) (2016) 1586–1592, https://doi.org/10.3945/jn.115.224741.
4. Foley JK, Michaux KD, Mudyahoto B, Kyazike L, Cherian B, Kalejaiye O, et al. Scaling Up Delivery of Biofortified Staple Food Crops Globally: Paths to Nourishing Millions. Food Nutr Bull. 2021 Mar 1;42(1):116–32. https://doi.org/10.1177/0379572120982501
5. African Union (2020). Upscaling Biofortification in Africa: A Roadmap

CITATION

Dusingizimana, T., Jones, A., Vasanthakaalam, H., & Kjelljvist, T. (2024). Coverage of iron-biofortified beans and influencing factors in the Northern Province of Rwanda. IMMANA Fellowship Briefing Note.

Funded by: UKaid from the British people; Bill & Melinda Gates foundation