Contribution of the biofortified beans in eradication of malnutrition in Burundi. Case study of Value Chain and Economic Development project implemented in Muyinga Province in Gashoho, Gasorwe and Muyinga.

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Abstract

Background: Fortification is the practice of deliberately increasing the content of an essential micronutrient, i.e. vitamins and minerals (including trace elements) in a food, so as to improve the nutritional quality of the food supply and provide a public health benefit with minimal risk to health. Bio fortification is the process by which the nutritional quality of food crops is improved through agronomic practices, conventional plant breeding, or modern biotechnology.

Methodology: The main aims of the Economic Development and Value Chain Project are to increase the economic capacity for agricultural producers and reduce chronic malnutrition in children under five years in target areas by 2016. HIB were chosen for their nutritional value (73% higher in iron than other beans) and their high yields. commune with 1,818 households interviewed and anthropometric data collected; Key Informant Interviews and Focus Group Discussions with key stakeholders.

Results: Chronic malnutrition prevalence amongst children under five has not reduced markedly between baseline and endline, although there was a small decrease of 3.6%. The decrease in the prevalence of underweight children was bigger (just over nine percent). While improvements in physical nutrition measures was minimal, there were definite changes in nutrition practices introduced by the Project and beneficiaries appear to have understood and be motivated to have a high level of dietary diversity. Over 60% of children 6-59 months consumed iron rich food daily. Although levels were good in the control area as well, the main source of iron rich food in project areas was from fish, representing a more sustainable nutrition practice than control areas whose main source was a nutrition blend distributed for free by an NGO. Consumption of HIB at the household level was lower than expected in project areas, explained by the timing of the survey, which was before harvesting of HIB had been completed and perhaps also because farmers prefer to keep the HIB to replant as seeds rather than consume. Beneficiaries in project areas were more likely to have a kitchen garden and were more likely to provide vegetables from their kitchen garden to their children under five years of age. One project component in particular, a crèche system for working families to leave their children, was consistently praised by stakeholders and beneficiaries as a great source of information about good nutrition practices for their children. As well, around half of households had been involved at some level in community nutrition related activities and there was positive recognition from stakeholders of the community mobilisers approach to influence community nutrition practice.

Introduction

Burundi's large share of youth population that provides a window of opportunity for high growth of development and poverty reduction. Burundi was devastated by many years of civil conflict and four wars following its independence in 1962. Burundi is one of the poorest countries in the world. The number of people below the poverty line almost doubled from 35 percent in 1993 to 67 percent in 2006 (Megerle and Niragira, 2020). Recent estimates based on wealth index comparison indicate that poverty might have worsened from 2005 to 2009. At least 80% of the population still subsists on less than US $1.25 per day (Asare-Marfo et al., 2016).

Burundi's children are among the most malnourished in the world, but a project empowering mother gives hope for a solution of Burundi's 11 million inhabitants, 90% rely on agriculture, which means a large proportion of the population is affected by acute food insecurity, climate hazards and limited access to land (Korachais et al., 2020).

The resulting malnutrition has been further aggravated by the return and reintegration of thousands of Burundian civil war refugees from Tanzania, as well as demobilized combatants, soldiers and police. The recent floods that affected the north of Bujumbura will only worsen the situation: 3,000 homes were destroyed, and thousands of displaced families are now living in tents in insanitary conditions (Babu et al., 2013). In Burundi, 67% of the population lives below the national poverty line and families spend more than 70% of their income on food, on average.

According to Burundi Health Demographic Survey 2010, 58% (Birol et al., 2015), of children under five are suffering from malnutrition. The global hunger index 2013 described the situation as "extremely alarming" and sited prolonged conflict and political instability as the causes of the continuing lack of access to food in the east African country. The index records that 73% of the population were undernourished in 2010 to 2012, which has gone up from 49% in 1990 to 1992. Burundi scores worst in the world for malnourishment in Oxfam's latest report, which found that 67% of the population are undernourished and 37% underweight (McClafferty and Islam, 2007).

Gilbert Nduwayo, director of Burundi's national Integrated Programme of Food and Nutrition says that access to land, low agricultural production, low level of education and decision-making power of women (the husband manages the harvest) and the weather are all factors in the countries high malnutrition rates. Moreover, Nduwayo indicates that one out of two households has non-diversified, unbalanced and insufficient food.The Burundian Association of Consumers (ABUCO) says they can't refute Oxfam's report on the state of nutrition in the country. Noel Nkurunziza, president of the ABUCO, says that farmers need more guidance.

"In every municipality throughout the country, there are at least two agricultural monitors, but they don't make field visits and farmers don't get the technical assistance they need to produce a good harvest and keep the best seeds for the next season." Educating mothers about nutrition and a balanced diet is key to raising a healthy next generation in Burundi.Boosting nutrition is a priority programme in Burundi Vision 2025 and the Burundian government's public health ministry has put a national Integrated Programme of Food and Nutrition (PRONIANUT) in place which works with international NGOs.

The main obstacle to progress is the Burundian culture itself. "In the poorest families, they are likely to eat beans and cassava paste every day. In middle class families and even in richer households, it's common to eat pasta, rice, French fries, beans and a heavy sauce for lunch," says Pelagie Ntahimpera. "Since women are the ones who prepare the meals, they must be equipped with the proper knowledge regarding nutrition, that's the only way to make sure that they use the little money they have efficiently."

A UNICEF study shows that the more educated mothers are, the better nourished their children are. Indeed, children of mothers with a primary

education level have 94% of less risks of growth stunting from malnutrition than children of mothers with no primary education at all. Mothers with a secondary education are three times less likely to raise malnourished children.

 Even if the children start to show signs of malnutrition, more educated mothers proactively manage the disease instead of being fatalistic. Also, the educated mother also knows the importance of breastfeeding for six months and the necessity of raising her children in a clean environment to avoid diseases like diarrhea, which worsens malnutrition. Finally, mothers who wait at least 48 months between births give their children a better chance to grow fully nourished. In recognition of the crucial role of mothers in reducing Burundi's shocking malnutrition rates, Pathfinder International has launched the Mamans Lumières(ML) programme in June 2011, to empower mothers to improve the health of their children.

The project identifies positive role models – women who have raised well-nourished children – and charges them with educating and encouraging other women to feed their children as best they can. Children involved in the project gained weight. Burundian mothers, once armed with sufficient knowledge, are the ones who can and are eradicating malnutrition throughout the country (Bouis et al., 2011a).

Methodology
The research used the mixed methods to collect evidence to establish endline values for project indicators and to collect evidence related to the evaluation questions. As outlined in the ToR, a sequential approach was used, with quantitative data collection, followed by qualitative data collection. In this way it was possible to undertake an initial review of the quantitative data before implementing the qualitative data collection.

Beneficiary Household Survey
The primary purpose of the beneficiary household survey was to determine endline values for project indicators as well as to gather data to help assess the evaluation questions.

Sample Size Estimation
The main variable of interest for the household survey comparison between baseline and endline was the percentage of children under five stunted. The definition is the percentage of children aged 0-59 months whose height-for-age is below minus two standard deviations from the median (or less than two standard deviations below the median) as determined by the WHO Child Growth Standards.

Qualitative Data Collection
A total of 28 Key Informant Interviews (KIIs) and 21 Focus Group Discussions (FGDs) were undertaken to collect qualitative data to respond to the evaluation questions.

Sampling
Sampling for the KIIs and FGDs was purposive – participants were selected based on their familiarity with the project. KIIs and FGDs took place in each of the three project communes to ensure geographical representation. When appropriate, FGDs were held separately for men and women.

Data analysis
Qualitative data analysis was undertaken using the basic principles of thematic analysis.[1] Data collected from the KIIs and FGDs was in the form of notes, which were translated into English by the evaluation team and a WVB appointed person.   The data was reviewed against topics relevant to answering the evaluation questions and then presented through narrative in the report organised by evaluation question.

Ethical consideration
Privacy and confidentiality: Entered data containing respondents' names was only accessible to a limited number of persons including the data entry officer(s) and the consultants. No actual personal name of an interviewed representative is mentioned in any report. Informed consent / voluntary participation: The consultants ensured that all

respondents were provided adequate background information about the purpose and intended uses of the evaluation and were asked to provide verbal informed consent to participate.

It was emphasised to all participants that their participation was voluntary. Accountability and complaint response mechanism: Enumerators introduced themselves and encouraged the respondent to use the existing suggestion boxes located outside each WVB field office, should they have any inquiry or complaint. Collecting data from the workplace: Evaluators ensured that all participants, especially those interviewed in their workplace such as WVB staff and government representatives, were aware that no information collected would be used to assess any individual's work performance and that refusal to participate in no way jeopardised the relationship between WV and that individual.

Results

Demographic characteristics of survey participants

Below demographic data about the survey participants and their households at baseline is presented in Table 6 and at endline in Table 5. It includes the proportion of survey participants that were female-headed households (FHH) and male-headed households (MHH).

Table 1 : Demographic information about survey participants

		Edline											
		Project						Control					
		Female		Male		Total		Female		Male		Total	
Total number		217		1144		1361		74		383		457	
Mean head of HH age		48.5		42.4		43.4		47.1		39.0		40.3	
Mean number HH members		4.4		5.9		5.7		4.2		5.5		5.3	
		N	Column %	N	Column %	N	Column %	N	Column %	N	Column %	N	Column %
Head of household marital status	Single	6	2.9%	5	.4%	11	.8%	3	4.2%	0	0.0%	3	.7%
	Married	60	28.7%	1106	98.9%	1166	87.9%	10	14.1%	381	99.7%	391	86.3%
	Divorce	29	13.9%	2	.2%	31	2.3%	19	26.8%	1	.3%	20	4.4%
	Widow	114	54.5%	5	.4%	119	9.0%	39	54.9%	0	0.0%	39	8.6%
Head of household education level	No formal education	100	47.8%	335	30.0%	435	32.8%	49	69.0%	141	36.9%	190	41.9%
	Adult education	31	14.8%	115	10.3%	146	11.0%	8	11.3%	48	12.6%	56	12.4%

	Attended primary	67	32.1%	592	53.0%	659	49.7%	13	18.3%	170	44.5%	183	40.4%
	Attended secondary	11	5.3%	72	6.4%	83	6.3%	1	1.4%	23	6.0%	24	5.3%
	Attended university	0	0.0%	4	.4%	4	.3%	0	0.0%	0	0.0%	0	0.0%
With disability	Head of HH	11	5.3%	53	4.7%	64	4.8%	3	4.2%	12	3.1%	15	3.3%
	HH member	11	5.1%	71	6.2%	82	6.0%	2	2.7%	13	3.4%	15	3.3%
Commune	Gashoho	71	32.7%	379	33.1%	450	33.1%	0	0.0%	0	0.0%	0	0.0%
	Gasorwe	78	35.9%	379	33.1%	457	33.6%	0	0.0%	0	0.0%	0	0.0%
	Muyinga	68	31.3%	386	33.7%	454	33.4%	0	0.0%	0	0.0%	0	0.0%
	Buhinyuza	0	0.0%	0	0.0%	0	0.0%	74	100.0%	383	100.0%	457	100.0%

In the project areas, there were 217 FHHs, representing 15.9% of survey participants in project areas, which is slightly lower than the baseline (19.8%). The proportion of FHHs at endline was similar to the control area (16.1%). Households in project areas at endline had slightly more household members than the control area (5.7 versus 5.3). This was the contrary at baseline. In project areas FHHs had fewer household members on average than MHHs (4.4 members versus 5.9 in MHHs). Heads of household in project areas had a mean age of 43.4 years, which is only slightly different to the mean age at baseline (41.1 years). FHHs were older than MHHs both at baseline and endline, and both in project areas and control areas. At endline, if the head of household was female, the head of household was more likely to have a disability (5.3%) than if the head of household was male (4.7%). Overall, 4.8% of heads of household had a disability and 6.2% of households had a member with a disability.

Table 2: Mean number of children in the household classified by age

	Project						Control					
	Female		Male		Total		Female		Male		Total	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
# of children <5 years old	.4	217	.9	1144	.8	1361	.6	74	1.1	383	1.0	457
# children <6 months	.0	217	.1	1144	.1	1361	.1	74	.2	383	.2	457
# Children between 6 and 59 months	.4	217	.8	1144	.7	1361	.5	74	.9	383	.9	457
# Children 5 through 18	2.1	217	2.6	1144	2.6	1361	1.9	74	2.2	383	2.2	457
Total number of children 0 to 18 years	2.5	217	3.5	1144	3.4	1361	2.5	74	3.4	383	3.2	457

In project areas FHHs had less children (0 to 18 years) in the house (on average 2.5) than MHHs (3.5). There was a higher number of children aged under five per household on average at baseline compared to end line, which led to the end line's sample target for children not being reached.

Number of smallholder farmers reporting increased value of sales

The first indicator is defined as: the number of HIB producers who report that they have an increased number of days of beans consumption or have an increase of beans sales or storage due to the increase of their own beans production. The endline established the proportion of participants producing HIB, the quantity they produced and quantities consumed, sold and stored. Table 11 shows the number and proportion of farmers who are currently farming HIB, traditional beans, and if both, the proportion that is HIB, disaggregated by male and female-headed households. Table 3: Number and proportion of respondents who currently farm HIB and non-HIB beans

Table 3: Number of smallholder farmers reporting increased value of sales

		Survey participants currently farming HIB		Survey participants currently farming other beans		If both, % that are HIB	
		N	%	N	%	Mean	N
Gashoho	Female	41	57.7%	63	88.7%	27.6	41
	Male	253	66.8%	342	90.2%	29.0	250
	Total	294	65.3%	405	90.0%	28.8	291
Gasorwe	Female	42	53.8%	76	97.4%	28.4	41
	Male	245	64.6%	367	96.8%	27.5	240
	Total	287	62.8%	443	96.9%	27.7	281
Muyinga	Female	43	63.2%	64	94.1%	23.1	43
	Male	274	71.0%	380	98.4%	32.2	272
	Total	317	69.8%	444	97.8%	31.0	315
Project subtotal	Female	126	58.1%	203	93.5%	26.3	125
	Male	772	67.5%	1089	95.2%	29.7	762
	Total	898	66.0%	1292	94.9%	29.2	887
Buniyuza	Female	0	0.0%	58	78.4%	n/a	0
	Male	4	1.0%	291	76.0%	35.0	4
	Total	4	.9%	349	76.4%	35.0	4

In project areas, 66% of respondents in project areas were currently farming HIB, while only 0.9% were farming HIB in the control area. Farmers in the project areas were also more likely to grow traditional beans than farmers in the control area (94.9% versus 76.4%). The highest proportion of farmers growing HIB was in Muyinga commune (almost 70%), then Gashoho (65.3%) and Gasorwe (62.8%). FHHs were almost 10% less likely to grow HIB compared to MHHs (58.1% versus 67.5%). This pattern was not the same for the farming of traditional beans where the difference between MHH (95.2%) and FHH (93.5%) was minimal. If farmers grew both HIB and traditional beans, approximately 30% of the beans grown were HIB.

The quantity of beans production at baseline and HIB production at endline is shown in Tables 4 and 5. In Table 6, the proportion of respondents growing HIB and their yields over the last three seasons is shown.

Table 4: Prevalence of global malnutrition, stunting and underweight among children aged 0-59 months

		Prevalence of global malnutrition (<-2 z-score and/or oedema)		Prevalence of stunting (<-2 z-score)		Prevalence of underweight (<-2 z-score)	
		N	%	N	%	N	%
Gashoho	Baseline	27	6.5%	251	63.5%	165	39.3%
	Endline	16	5.8%	181	65.3%	91	33.1%
Gasorwe	Baseline	38	7.5%	313	64.5%	185	36.5%
	Endline	18	6.2%	169	57.1%	83	28.7%
Muyinga	Baseline	30	6.5%		58.4%	138	29.6%
	Endline	13	3.9%	183	54.1%	57	17.2%
Project Subtotal	**Baseline**	**98**	**7.1%**	**819**	**62.1%**	**488**	**35.1%**
	Endline	**47**	**5.3%**	**533**	**58.5%**	**231**	**25.8%**
Buniyuza	Baseline	35	8.5%	239	61.0%	153	37.1%
	Endline	26	7.1%	242	63.7%	138	37.4%

The prevalence of stunting decreased from baseline to endline, however the change was minimal (from 62.1% at baseline to 58.5% at endline; a decrease of 3.6%) and unfortunately it is not possible to undertake significance testing between baseline and endline data. The prevalence of underweight children decreased from 35.1% to 25.8% at endline. The prevalence of global malnutrition also decreased from 7.1% to 5.3% at endline. The prevalence of global malnutrition decreased more in Muyinga compared to the other communes.

Table 5: Prevalence of nutrition measures for children under five disaggregated by gender of head of household

Child Sex		Wasting WHZ category						Stunting HAZ category					
		Any wasting		Moderate Wasting		Severe Wasting		Any stunting		Moderate Stunting		Severe Stunting	
		N	%	N	%	N	%	N	%	N	%	N	%
Gashoho	Female	5	3.8%	5	3.8%	0	0.0%	88	67.2%	47	35.9%	41	31.3%
	Male	11	7.7%	8	5.6%	3	2.1%	93	63.7%	46	31.5%	47	32.2%
	Total	16	5.8%	13	4.7%	3	1.1%	181	65.3%	93	33.6%	88	31.8%
Gasorwe	Female	7	4.6%	6	3.9%	1	.7%	94	59.9%	53	33.8%	41	26.1%
	Male	11	8.1%	10	7.4%	1	.7%	75	54.0%	42	30.2%	33	23.7%
	Total	18	6.2%	16	5.5%	2	.7%	169	57.1%	95	32.1%	74	25.0%
Muyinga	Female	7	4.5%	5	3.2%	2	1.3%	91	56.2%	65	40.1%	26	16.0%
	Male	6	3.4%	4	2.3%	2	1.1%	92	52.3%	60	34.1%	32	18.2%
	Total	13	3.9%	9	2.7%	4	1.2%	183	54.1%	125	37.0%	58	17.2%
Program Subtotal	Female	**19**	**4.3%**	**16**	**3.6%**	**3**	**.7%**	**273**	**60.7%**	**165**	**36.7%**	**108**	**24.0%**
	Male	**28**	**6.2%**	**22**	**4.9%**	**6**	**1.3%**	**260**	**56.4%**	**148**	**32.1%**	**112**	**24.3%**
	Total	**47**	**5.3%**	**38**	**4.3%**	**9**	**1.0%**	**533**	**58.5%**	**313**	**34.4%**	**220**	**24.1%**
Buniyuza	Female	12	6.6%	9	5.0%	3	1.7%	114	61.0%	55	29.4%	59	31.6%
	Male	14	7.5%	13	7.0%	1	.5%	128	66.3%	51	26.4%	77	39.9%
	Total	26	7.1%	22	6.0%	4	1.1%	242	63.7%	106	27.9%	136	35.8%

Child Sex		Underweight WAZ category						MUAC category					
		Any Underweight		Moderate Underweight		Severe Underweight		Any wasting		Moderate Wasting		Severe Wasting	
		N	%	N	%	N	%	N	%	N	%	N	%
Gashoho	Female	48	36.6%	36	27.5%	12	9.2%	26	19.8%	22	16.8%	4	3.1%
	Male	43	29.9%	28	19.4%	15	10.4%	17	11.6%	13	8.8%	4	2.7%
	Total	91	33.1%	64	23.3%	27	9.8%	43	15.5%	35	12.6%	8	2.9%
Gasorwe	Female	42	27.5%	28	18.3%	14	9.2%	24	15.3%	17	10.8%	7	4.5%
	Male	41	30.1%	31	22.8%	10	7.4%	21	15.1%	15	10.8%	6	4.3%
	Total	83	28.7%	59	20.4%	24	8.3%	45	15.2%	32	10.8%	13	4.4%
Muyinga	Female	27	17.2%	18	11.5%	9	5.7%	16	9.9%	13	8.0%	3	1.9%
	Male	30	17.2%	22	12.6%	8	4.6%	13	7.4%	11	6.3%	2	1.1%
	Total	57	17.2%	40	12.1%	17	5.1%	29	8.6%	24	7.1%	5	1.5%
Program Subtotal	Female	117	26.5%	82	18.6%	35	7.9%	66	14.7%	52	11.6%	14	3.1%
	Male	114	25.1%	81	17.8%	33	7.3%	51	11.0%	39	8.4%	12	2.6%
	Total	**231**	**25.8%**	**163**	**18.2%**	**68**	**7.6%**	**117**	**12.8%**	**91**	**10.0%**	**26**	**2.9%**
Buniyuza	Female	58	31.9%	39	21.4%	19	10.4%	38	20.1%	24	12.7%	14	7.4%
	Male	80	42.8%	56	29.9%	24	12.8%	47	24.1%	33	16.9%	14	7.2%
	Total	138	37.4%	95	25.7%	43	11.7%	85	22.1%	57	14.8%	28	7.3%

There was slightly higher prevalence of wasting (weight for height) in MHHs, but lower in wasting measured with MUAC. There was a higher prevalence of moderate stunting in FHHs but the difference was small. Overall, there were no major differences between FHHs and MHHs.

Households in Muyinga had a higher proportion of children with moderate stunting but a much smaller proportion with severe stunting. They also had a smaller proportion of underweight children, both moderate and severe, and a smaller proportion of wasting measured with MUAC. Although Muyinga had a smaller proportion than the other communes of global malnutrition, stunting, and underweight at baseline as well, the reduction in prevalence

Conclusion
The Project did not to appear to have a significant impact on the prevalence of stunting or global malnutrition. Although there was a decrease of the proportion of children under five stunted from baseline to endline, the change was minimal, from 62.1% at baseline to 58.5% at endline; a decrease of 3.6%. The decrease of the prevalence of underweight children was greater (around 9% decrease); while the prevalence of global malnutrition decreased a very small amount (less than 2% decrease).

Differences between MHHs and FHHs were very small, despite MHHs producing and selling greater quantities of HIB than FHHs. As well, although Muyinga had performed better than the other two communes in terms of HIB production, the difference between baseline and endline prevalence of chronic malnutrition (stunting) was not very different to the other communes. Nevertheless, the prevalence of global malnutrition reduced much more in Muyinga than the other two communes. Despite the minimal changes in nutrition measures, there were significant changes in nutrition related behaviour, although this was the case for both project and control areas, so it cannot necessarily be attributed to the Project. There was a very large increase in the proportion of children consuming iron rich food.

Although this was the case for both project and control areas, the sources of iron rich food were different, indicating that households may have been influenced by the training provided by the Project. For example, the main source of iron rich food for children in project areas was fish, while in control areas the main source was a nutritional blend provided by a CRS-run nutrition program, which provides the blend to all mothers and pregnant women. Another

from baseline to endline was greater than the other communes.The project established the proportion of children consuming (daily) iron-rich or iron-fortified foods as per the project indicator as well as the proportion of children consuming Vitamin A-rich food. Table 37 shows the proportion of children who consumed iron-rich food and Vitamin A-rich food in the previous 24 hours.

major difference was that project households gave HIB and HIB flour mixtures to their children, while control households did not. Children in both project and control areas were receiving Vitamin A capsules, while the consumption of a micronutrient mixture was small. Therefore, despite little change in prevalence of stunting and other nutritional measures, people's practices had changed and feedback from beneficiaries was that they had increased their dietary diversity, thanks to the awareness raising from the Project both through community mobilisers trained by the Project, and through the crèche.

Why this change in nutritional practices has not had an impact on the physical measures is not clear, although it could be related to nutritional levels at a national level worsening in the last year (confirmed during KIIs) and so the Project only managed to mitigate those worsening levels in the target areas rather than improve levels. Another possibility is that the effects of the behavioural changes has not yet had a chance to impact the physical nutritional measures. It would be interesting to undertake a nutritional survey after the harvest for the current season, to see if the good performance of an HIB harvest makes a difference in the prevalence of chronic malnutrition.

Project beneficiaries appear to have understood and be motivated to have a high level of dietary diversity. The sustainability of changes made in their nutritional practices is related closely to the being able to access a diverse diet. The Project attempted to create this access through kitchen gardens. While almost 60% of respondents in project areas said that they were likely or extremely likely to continue or establish a new kitchen garden, over 20% of FHHs indicated that there was no chance of continuing or establishing a new kitchen garden. Beneficiaries

in general perceived the kitchen gardens as having a low level of production in relation to the labour required to establish and maintain it. Therefore, a new way of managing kitchen gardens (for example, group households together) or a new way of sourcing nutritionally rich food may be needed in order for beneficiaries to sustain their nutrition practices. Given the success of the HIB farming, it would seem highly likely that beneficiaries would have HIB as a regular feature in their diet in the future, especially as beneficiaries believed it was important nutritionally speaking. It was also rated as very tasty and easy and quick to cook by beneficiaries. However, beneficiaries self-reported that they were not likely to eat HIB twice a week over the next year. It would be interesting to explore this more in depth. It might be that beneficiaries are more interested in selling HIB (which has a high demand and value) than consuming it themselves.

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