Article

Not peer-reviewed version

Evaluating Double-Duty Actions in Rwanda's Secondary Cities

Sophia Demekas , Helen Prytherch , Francine Bayisenge , Straton Habumugisha , Klaus Kraemer , Jimena Monroy-Gomez , Immaculee Nabacu , Cornelia Speich , Innocente Turinimigisha , Dominique Barjolle *

Posted Date: 9 May 2024

doi: 10.20944/preprints202405.0572.v1

Keywords: double burden of malnutrition; food system transition; nutrition policy; nutrition interventions

Article

Evaluating Double-Duty Actions in Rwanda's Secondary Cities

Sophia Demekas [1]*, Helen Prytherch [23], Francine Bayisenge [2], Straton Habumugisha [4], Klaus Kraemer [4], Jimena Monroy-Gomez [5], Immaculée Nabacu [4], Cornelia Speich [23], Innocente Turinimigisha [4] and Dominique Barjolle [1]

[1] Department of Environmental Systems Science, ETH Zürich; sophwildem@gmail.com, barjolle@ethz.ch
[2] Swiss Tropical and Public Health Institute; helen.prytherch@swisstph.ch, cornelia.speich@swisstph.ch, francine.bayisenge@swisstph.ch
[3] University of Basel
[4] Sight and Life;straton.habumugisha@sightandlife.org, klaus.kraemer@sightandlife.org, innocente.turinimigisha@sightandlife.org, nabacu.immaculee@sightandlife.org
[5] Independent; lnjimenamonroy@gmail.com
* Correspondence: sophwildem@gmail.com

Abstract: The double burden of malnutrition (DBM) is escalating in low- and middle-income countries (LMICs), including in Rwanda, most notably in urbanizing areas. The 2019-2020 Rwanda Demographic Health Survey (DHS) revealed 33% of children under 5 are stunted while 42% of women in urban areas are overweight or obese. This coexistence has contributed to a surge in non-communicable diseases (NCDs), particularly in secondary cities. Using the World Health Organization's (WHOs) "double-duty action" (DDA) concept, this study aims to identify and evaluate interventions with double-duty potential in Rwanda, focusing on the districts of Rusizi and Rubavu. Guided by Hawkes et al.'s conceptual framework for identifying DDA entry points, a desk review of national policies pinpointed 4 programs with DDA potential: early childhood development (ECD) centers, the school feeding program, farmer field schools (FFS), and the provision of nutrition-sensitive direct support. In-person interviews with key stakeholders assessed their implementation and a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis informed context-specific recommendations for their improvement. Recommendations include targeting beliefs surrounding nutrition, improving trainings for community educators, enhancing parent – particularly father – involvement, and close follow-up. These findings offer actionable strategies for governments and nutrition stakeholders and may benefit similar interventions in other rapidly urbanizing LMICs.

Keywords: double burden of malnutrition; food system transition; nutrition policy; nutrition interventions

1. Introduction

Known as the double burden of malnutrition (DBM), the co-existence of undernutrition (stunting, wasting, and micronutrient deficiencies) with overweight, obesity, and diet-related non-communicable diseases (NCDs) is a rising global threat, particularly in low- and middle-income countries (LMICs) [1]. Over the last 30 years, obesity rates have doubled globally and more than tripled in LMICs [2]. Today, 85% of deaths due to diet-related NCDs occur in LMICs [3] where nutrition policies tend to be founded on "calorie fundamentalism", meaning they prioritize increasing access to calories to reduce undernutrition [4]. Nutriton-targeted policies and programs are also often siloed and implemented by different governance and funding structures [5–7].

In an effort to remediate this, the World Health Organization (WHO) coined the concept of "double-duty actions" (DDAs) as cross-sector interventions, programs, or policies that target all forms of malnutrition simultaneously [8]. Health experts have since stressed the urgent need to

 doi:10.20944/preprints202405.0572.v1

prioritize research into DDAs moving forward given the current gap in research on their effects and areas for improvement [6,9]. Thus, the aim of this paper is to evaluate the potential for DDAs in Rwandan national policies to combat the DBM at district level by using Rusizi and Rubavu districts as case studies.

DDA Conceptual Framework

The concept of DDAs is grounded in the notion that issues of under- and overnutrition share common roots and that the best way to address them is to target their shared drivers. In 2020, Hawkes et al. introduced a framework which defines four shared and modifiable drivers of DBM as the following: early life nutrition, diet quality, food environments, and socio-economic status (**Table 1**) [5].

Table 1. Shared drivers of the double burden of malnutrition per Hawkes et al. 2020.

Shared Drivers	Description
Early life nutrition	Nutrition for pregnant and lactating mothers and children under 2 years has a profound influence on physical development for both mother and child and food-related behavior later in life.
Diet quality	Poor diet quality can lead to micronutrient deficiencies and/or excess consumption of nutrients-to-limit (e.g., salt, sugar, fat), both of which are associated with a higher risk of non-communicable diseases (NCDs).
Food environments	The way food is priced, marketed, and made available to a population all shape the food environment and influence food choices in a positive or negative way.
Socio-economic factors	Increased income is associated with lower rates of stunting and anemia but is simultaneously associated with a higher risk of overweight and obesity. Higher education is associated with lower rates of both.

Hawkes et al.'s framework also identified ten entry points for DDAs across different sectors. **Figure 1** lays out an adaptation of Hawkes et al.'s conceptual framework applied in this paper to the case of Rwanda, illustrating the ten priority entry points for DDAs across the sectors of health, social protection, education, agriculture, and the food system policy environment.

Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 9 May 2024 doi:10.20944/preprints202405.0572.v1

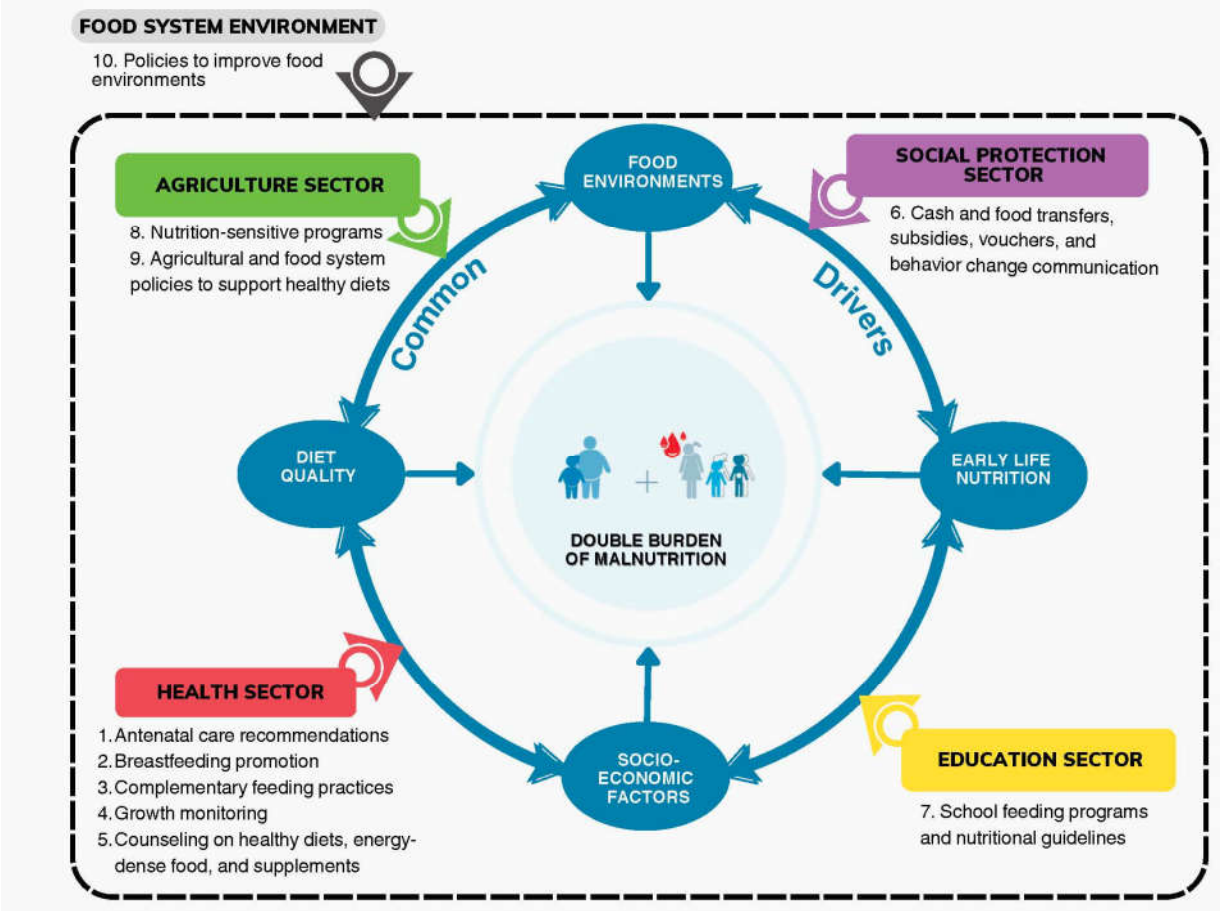

Figure 1. Ten priority candidates with double duty action potential (numbered points) separated by sector (colored rectangles) targeted at the four common drivers (ovals) of the double burden of malnutrition. Source: Visualization adapted from Hawkes et al. 2020

Case Study: DBM and DDAs in Rwanda

Located in central sub-Saharan Africa, Rwanda is a small land-locked country known as the "land of 1,000 hills". While 74.5% of its land is used for agriculture, most of it is on hillsides with limited terracing and low irrigation [10]. Despite its small size, Rwanda is one of the most densely populated countries in Africa, with a population of 14.4 million, mostly concentrated in its central regions and its rapidly urbanizing Western province, where Rubavu and Rusizi are located [10,11]. Rwanda's high population growth, limited land for agriculture, and vulnerability to an increasingly variable climate put its food system at significant risk and lead to large sections of the country suffering from food insecurity and malnutrition [12].

While Rwanda has seen a considerable reduction in stunting and wasting over the past 20 years thanks to targeted nutrition policies [13], it has simultaneously experienced a steep rise in overweight and obesity [12]. Diet-related NCDs in Rwanda, such as diabetes, cancers, and cardiovascular disease (CVD), account for 44% of the country's annual mortality and continue to rise at a concerning rate [3]. These trends are most severe in the Western province where food insecurity and malnutrition are the highest, particularly in secondary cities [12].

An upcoming report by the High Level Panel of Experts on Food Security and Nutrition (HLPE-FSN) on strengthening urban and peri-urban food systems has stressed the fragility of secondary cities' food systems and emphasizes the importance of strategic investments in food security and nutrition in these areas [14]. Rwanda's Vision 2050, a development plan launched to spur economic growth, selected six secondary cities to invest in to ease the pressure of urbanization in Rwanda's capital city, Kigali, and to distribute economic growth across the country [15]. Rubavu and Rusizi, two of the six secondary cities selected, are clear examples of urbanization's exacerbating effects on the growing DBM.

 doi:10.20944/preprints202405.0572.v1

In August 2021, the Nutrition in City Ecosystems (NICE) project, a multi-country and multi-stakeholder project aiming to improve healthy nutrition through sustainable, local food production in urban food systems [16], launched a baseline nutrition study in 150 urban households in Rubavu and Rusizi districts. The study confirmed that multiple forms and indicators of malnutrition were largely more severe in these urbanizing areas compared to the national averages [17] (**Figure 2**).

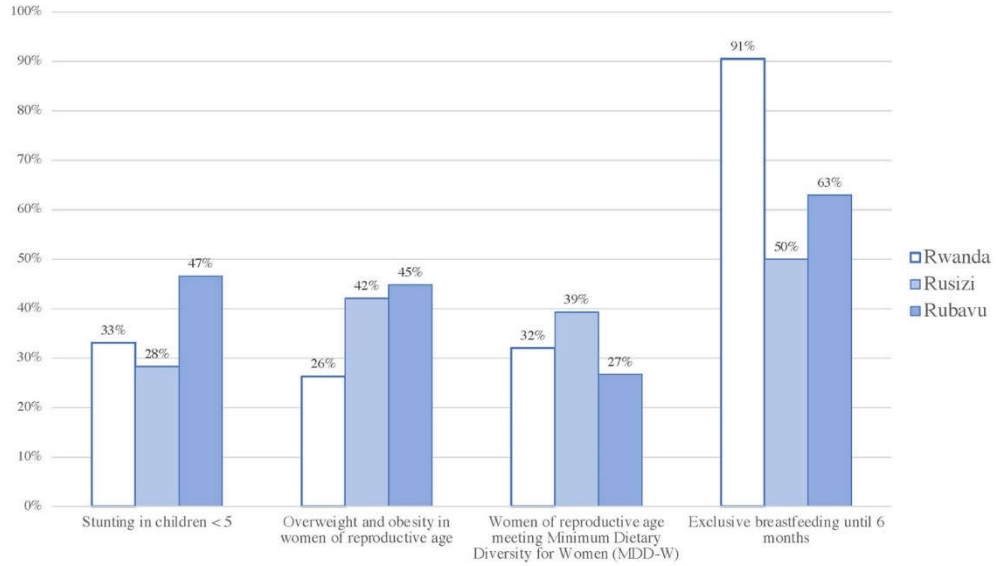

Figure 2. Priority areas of malnutrition in Rusizi and Rubavu compared to national average in Rwanda. *Notes.* Stunting defined as height-for-age Z-score below -2 SD; Overweight defined as BMI≥25 in women over 19, defined as BMI-for-age Z-score over +2 SD; MDD-W calculated from the number of food groups consumed by women of reproductive age in the past 24 hours. *Source: Data sourced from Rwanda DHS 2019-20, CFSVA 2021; Barth-Jaeggi, 2023 .*

Given these results, this paper aims to assess Rwanda's potential to combat the DBM by identifying the existing DDAs programs active within Hawkes et al.'s defined entry points in its policies and evaluate how they are in Rubavu and Rusizi.

2. Methods

In a first step to identify the existing DDA entry points in Rwanda's policies, a desk review of all nutrition-related policies and programs identified 12 ongoing interventions in Rubavu and Rusizi that qualify as DDAs. This was followed by stakeholder interviews to evaluate implementation and identify context-specific barriers to success and opportunities for improvement. These results were analyzed and transformed into discrete recommendations for improvement for each program.

2.1. Data Collection

A desk review was conducted by searching the Global Database on the Implementation of Nutrition Action (GINA) and the Food, Agriculture, and Renewable Natural Resources Legislation Database (FAOLEX) for all nutrition-related policies and programs in Rwanda. Documents were considered nutrition-related if they included interventions targeting WHO's 2025 Global Nutrition Targets: stunting, anemia, low birth weight, wasting, overweight, and breastfeeding practices [18]. If a relevant document was not up to date on either database, it was cross-checked on government ministry websites or obtained directly from government representatives via email request. If both the policy and strategic plan of the same document were available, the strategic plan was selected given its higher level of detail. National and district-level plans, policies, and strategic plans written in English in their most recent published version were included while operational guidelines, regulations, standards, and legislative documents were excluded.

 doi:10.20944/preprints202405.0572.v1

Twenty-four documents were considered nutrition-relevant and were read in their entirety. The objectives, outcomes, and activities in each were reviewed to identify ongoing projects that corresponded to the ten DDA entry points defined in **Figure 1**. Nine documents were excluded because they did not include DDAs, they had been replaced by an updated version, or because a Strategic Plan of the same policy was available. This left 15 documents and a total of 197 actions matching DDA entry points. A detailed summary of which actions by document qualified as DDAs is provided in Appendix A.

The 197 identified actions matching DDA entry points all corresponded to an active government or development partner-supported program (e.g., the national fruit tree program). Twelve of these programs were selected for further evaluation based on the following criteria: they were active in both Rubavu and Rusizi and interviewees selected had direct experience in their implementation.

Key stakeholders were selected for in-person interviews using purposive sampling [19]. Participants were selected if they were professionals working in health, education, social services, or agriculture in Rubavu and Rusizi and were local collaborators of NICE. In total, 37 participants agreed to be interviewed, 17 in Rusizi and 20 in Rubavu.

Table 2. lists the number and professions of interviewees selected from each district. Interviews were held between June 27th and July 14th 2023 and ranged from 19 minutes to 60 minutes. Interviews were conducted in English, French, or Kinyarwanda, depending on the preference of the participant, with the support of an interpreter familiar with the local context and culture. All interviews were recorded using a TASCAM Dr-05X audio recorder with written permission from participants and were manually transcribed afterwards in English. Each participant was provided with an information and consent form and a checklist of all DDAs of interest in both English and Kinyarwanda, after which they were asked to discuss the strengths and weaknesses of the ones they had experience in. Interviews followed a semi-structured open-ended question guide (Appendix B) to allow participants the freedom to express their thoughts and allow certain responses to be questioned more in depth [20].

Table 2. Interviewee professions in Rusizi and Rubavu.

Sector	Position	Rusizi (17)	Rubavu (20)
Health	District Directors of Health	1	1
	Nutritionists in district hospitals	1	1
	Antenatal care (ANC) providers and nurses	1	1
	Community health workers (CHWs)	1	1
	Early Childhood Development (ECD) center workers: leaders, caregivers, volunteers	2	3
Education	District Directors of Education	1	1
	School teachers (Heads of Nutrition & Environment clubs)	3	2
Social Protection	ECD District Focal Points	1	1
	National Women's Council representatives	1	1
	Members of non-governmental organizations (NGOs)	2	2
	Representatives of faith-based organizations (FBOs)	0	2
Agriculture	District Directors of Agriculture	1	0
	Farmer Field School (FFS) facilitators	1	2
	One Acre Fund officers	1	1
	Veterinarians	0	1

2.3. Data Analysis

 doi:10.20944/preprints202405.0572.v1

QSR NVIVO was used to analyze transcripts by thematic coding [21] to extract common themes that fit within the four categories of SWOT analysis: Strengths, Weaknesses, Opportunities, and Threats. This analysis was selected given its recent recognition as a tool for incorporating community input into the design of health promotion strategies [22] and was adapted to this study to assess the DDA-relevant programs and develop actionable strategies for their improvement. Specific recommendations for improving each program were generated by fitting together themes across the four categories (S,W,O,T) in an effort to address more than one at once [22].

2.3. Focus Group Discussion and Validation

Initial findings were discussed in focus groups with NICE project members and local program implementers for validation. Through follow-up discussions held over Zoom, the SWOT results for each intervention and resulting strategies were evaluated for technical and cultural validity. Following several rounds of feedback and discussion, final strategy recommendations were developed by consensus.

2.4. Ethical Approvals and Considerations

This research project was approved by the Rwanda National Ethics Committee (FWA Assurance No. 00001973) on the 16th of June 2023 and the ETH Ethics Commission on the 28th of June 2023 as proposal EK 2023-N-128. All interviewees were informed that participation was voluntary and that they could choose to withdraw at any time or decline to respond to any question. All identifying information of participants was encrypted and safely stored on a password-protected computer. Results presented to focus groups and later published were presented in an anonymized form. There was no compensation provided for participation in the study.

3. Results

3.1. Final DDA Interventions

Table 3 presents the twelve programs identified in Rwanda's policies and strategic plans that show the greatest potential for double-duty effect based on Hawkes et al.'s conceptual framework and the selection criteria outlined above. Detailed descriptions of these programs are provided in Appendix C.

Table 3. Desk review results: 12 DDA programs by sector.

Sector	DDA Program
Health Sector	Antenatal care (ANC) visits
	Early Childhood Development (ECD) centers
	Exclusive breastfeeding promotion
Education	**School feeding program**
	Trainings (teachers, caregivers, community health workers)
Social Protection	Social behavior change campaigns
	Non-communicable disease (NCD) prevention and physical activity promotion

 doi:10.20944/preprints202405.0572.v1

	Nutrition-Sensitive Direct Support (NSDS) and Shisha Kibondo
Agriculture	Farmer Field Schools (FFS)
	Small stock distribution
	Fruit tree program
	Kitchen garden program

Note. **Bold** indicates the program was selected for further evaluation.

3.2. SWOT Analysis Results

When asked to evaluate the successes and failures of the twelve programs in **Table 3**, participants provided their insights based on their lived experiences. These responses were combined and categorized into common strengths, weaknesses, opportunities, and threats in the form of one SWOT table for each program. All twelve SWOT tables are found in Appendix D. For the purposes of this paper, we selected one program from each sector (health, education, social protection, and education), emphasized in **bold** in **Table 3**, for further analysis. The following four sections present the results of this analysis with a SWOT table for each program (P1-4) and three recommendations (R1-3) for improvement for each. Recommendations for improvement for all twelve programs are found in Appendix E.

Program 1 (P1). Early Childhood Development (ECD) Centers (Health Sector)

ECD centers provide services for children aged 3 to 6 years with the goals to prevent delay in brain stimulation and ensure healthy growth in the period before they can attend primary school. Services include education, nutrition, protection, and sanitation and some centers also support pregnant and breastfeeding women through education sessions on proper child care. ECD centers are jointly funded by the government, development partners and NGOs, and through parent contributions. As a result, centers vary significantly in the resources they are able to provide and in their ability to compensate caregivers, ranging from lowest capacity at home-based ECD centers to highest capacity at model ECD centers. **Table 4** provides a SWOT matrix summarizing participant responses when they were asked to evaluate the benefits and challenges they faced with the ECD program in their district.

 doi:10.20944/preprints202405.0572.v1

Table 4. SWOT: Early childhood development (ECD) centers.

STRENGTHS	**WEAKNESSES**
S1. Parents see changes in children and are motivated to follow ECD model at home **S2**. Home visits show that parents start implementing kitchen gardens after seeing them at ECDs **S3**. Training of ECD caregivers improves quality of services and trainings	**W1**. Low parent monetary contribution **W2**. Inconsistent and unequal support across ECDs (meals, materials, caregiver support) **W3**. Not enough food at ECDs for all children **W4**. Lack of fruits and animal products in meals provided at ECDs
OPPORTUNITIES	**THREATS**
O1. Option for parents to make non-monetary contributions (food; firewood and charcoal; cooking, cleaning, gardening services) **O2**. Increased trainings for caregivers (ensuring continuous education) **O3**. Increased parent involvement (e.g., parents form groups to raise money to improve ECDs) **O4**. Income or non-monetary compensation for caregivers (money is best incentive even if small amount) **O5.** Close follow-up (home visits to monitor changes or adoption of practices) **O6**. Incentives for caregivers to attend trainings **O7**. Introduce attractive new topics for trainings based on what caregivers want	**T1**. Shared mindset that ECDs are a government program and responsibility **T2**. High cost of healthy food at market and high price volatility **T3**. Lack of sufficient funding **T4**. Caregivers not compensated or incentivized to attend trainings and many do not have the time **T5.** Stock-outs (porridge stock-outs lead to drop-outs or ECD closures) **T6.** Lack of long-term program sustainability without partner or government support **T7**. Inconsistent government budget (leads to stock-outs) **T8**. Lack of knowledge (parents do not know or value proper ECD services) **T9.** Parents do not have the time to attend ECD trainings or education sessions

Interviewees unanimously spoke very highly of the impact ECD centers had in their community, both in improving child nutrition and in encouraging parents to adopt healthy practices in their homes. ECD caregivers expressed enthusiasm about the trainings they received, including how to prepare a balanced diet and how to start a vegetable garden. Common frustrations among participants were recurring food and material stock-outs, a lack of income for caregivers, and low parent contributions and involvement in the program. When asked how the program could be improved, interviewees suggested closer follow-up with parents to incentivize contributions and allowing the option to those who could not afford monetary contributions to contribute in other ways (e.g., by donating food, firewood, manure, or services). Others also brought up the idea of providing caregivers with incentives to attend trainings since, in most cases, income was infeasible.

Based on these responses, the SWOT matrix framework was used to generate specific recommendations for improving the program by fitting together themes across the four categories (S,

 doi:10.20944/preprints202405.0572.v1

W, O, T) in an effort to address more than one at once [22]. Following, we present three recommendations generated for ECD centers by integrating relevant SWOT themes.

P1-R1. We recommend consulting with caregivers on which skills or topics they want training on and providing them with incentives to attend trainings, especially given that they are not compensated for their work at the ECD. Possible incentives could include transport allowances or free manuals and educational materials to take home.
Relevant S,W,O,Ts: **S3**; **W2**; **O2**, **O4, O6, O7**; **T4**

P1-R2. We recommend assigning specific responsibilities to parents, especially fathers, at ECDs to increase their involvement and thereby encourage them to adopt ECD services at home and motivate them to contribute. These responsibilities could include gardening, cooking, or cleaning tasks. We also recommend assisting parent groups to set up parent-led SLCs (Saving Lending Committees) through which they can collectively pool money to purchase materials for ECDs during stock-outs (e.g., porridge, milk)**.**
*Relevant S,W,O,Ts***: S1**, **S2**, **S4**; **W1, W2, W3, W4**; **O1**, **O3**; **T1**, **T2**, **T3**, **T5**, **T6, T7**, **T8**

P1-R3. We recommend ensuring that all centers engage in at-home follow-up with households to ensure that parents are adopting ECD lessons on healthy diets and lifestyle practices at home
Relevant S,W,O,Ts: **S2**; **O5**; **T8**, **T9**

Program 2 (P2). Farmer Field Schools (Agriculture Sector)

The farmer field school (FFS) program recruits and trains farmer facilitators on "best agricultural practices" using local crops. Upon completion of training, each FFS facilitator is assigned 25-30 farmers to educate in these practices and follow up with as well as a small plot of land in their community (demo plot) for demonstrations. Farmers are taught how to select breeds and healthy feed for livestock, maintain soil health, improve the quality of manure and organic fertilizer, and prioritize the planting of nutritious crops for at-home consumption, among other skills. Each step of the preparation, planting, maintenance, and harvesting process is demonstrated for the attending farmers. **Table 5** summarizes participant responses on the benefits and challenges of the FFS program in the form of a SWOT matrix.

Table 5. SWOT: Farmer Field Schools (FFS).

STRENGTHS	**WEAKNESSES**
S1. SMS reminders for farmers (when to top dress, weed, harvest) work well when in-person follow-up is impossible **S2.** Model plot hands-on demonstrations effective at engaging farmers **S3**. Farmers reached through the program are motivated to learn new methods	**W1**. Animal products are the first thing farmers sell on the market (not kept for at-home consumption) **W2**. Lack of feed industry in many districts results in high costs and long wait times to acquire feed **W3.** Often there are not enough trained FFS facilitators to cover all farmers
OPPORTUNITIES	**THREATS**

 doi:10.20944/preprints202405.0572.v1

O1. Improved quality of feed for small stock (alternative methods e.g., black soldier flies) **O2.** Continuous education for farmers and follow-up from FFS facilitators **O3.** More frequent and recurring trainings for FFS facilitators on best practices and on facilitation	**T1.** Farmers prioritize selling production to buy land or other inputs rather than consuming it **T2**. Farmers who don't receive follow-up become disincentivized to continue implementing best practices **T3.** Inputs and feed are expensive on the market (organic fertilizers especially) **T4**. Shared mindset to value quantity of production over quality **T5.** Belief that nutritious food is for wealthy people **T6.** Small stock often fall ill (due to bad practices or poor quality of feed)

The FFS facilitators interviewed agreed that hands-on model plot demonstrations and close follow-up with farmers, either in-person or through regular SMS reminders, were effective at motivating farmers to adopt and follow new practices. A challenge facilitators repeatedly faced was the high cost of inputs and poor quality of feed on the market, which discouraged farmers from adopting and following new practices. Another challenge was the common practice of selling production, particularly livestock or animal-based products, to buy more land or expensive inputs. These challenges were exacerbated in cases when facilitators were unable to follow up with farmers over long periods of time. When asked how the program could be improved, facilitators requested more frequent trainings and recruitment of facilitators.

P2-R1. We recommend investing in establishing a local feed supplier and distributor in or accessible to Rubavu and Rusizi districts with the capacity to supply high-quality feed in sufficient quantities to surrounding farming households. We also recommend incentivizing or supporting research and education on sustainable feed alternatives as some FFS facilitators have already done with black soldier flies.
Relevant S,W,O,Ts: **W2; O1; T1, T3, T4, T6**

P2-R2. We recommend increasing the number and frequency of trainings and providing regular refresher sessions for FFS facilitators to sustain their motivation and encourage continuous learning.
Relevant S,W,O,Ts: **S2, S3**; **W3; O3**

P2-R3. Given that in-person follow-up to all farmers by facilitators is often infeasible, especially in rural areas, we recommend scaling up SMS reminders for farmers to ensure they are implementing the lessons they learned at appropriate times (e.g., weeding, harvesting, cover-cropping) and encourage them to not sell their production.
Relevant S,W,O,Ts: **S1; W1, W3; O2; T2, T5**

Program 3 (P3). School Feeding Program (Education Sector)

The aim of the school feeding program is to ensure that every child in Rwanda receives at least one healthy meal per day if they attend school. The average cost of a base meal for one child is 150 RWF and, while the government subsidizes some of this cost (56 RWF), the child's parents must cover the rest. Parents who are unable to contribute money can contribute food, materials or services instead. Some schools have gardens run by teacher-led nutrition clubs that are used to grow vegetables intended to supplement school meals. **Table 6** provides a SWOT matrix summarizing participant responses when they were asked to evaluate the benefits and challenges they faced with the school feeding program.

 doi:10.20944/preprints202405.0572.v1

Table 6. SWOT: School feeding program.

STRENGTHS	**WEAKNESSES**
S1. Non-monetary contributions by parents can help subsidize school meals (e.g., small fish, peanuts, sweet potatoes) **S2**. Parent meetings and mobilization increase awareness, motivation, and contributions **S3**. Daily school meals have improved school attendance and focus in class	**W1**. Low parent contribution **W2**. Lack of animal products or vegetables or fruits in the menu (always maize, beans, rice, potatoes, soya)
OPPORTUNITIES	**THREATS**
O1. Increase collaboration between parents and school to increase contribution and involvement **O2**. Increase collaboration with local government or leaders to encourage parents **O3**. Run trainings at schools for parents on starting and maintaining vegetable gardens **O4**. Increased kitchen and eating materials to meet demand (e.g., "muvero", plates, utensils, cooking needs)	**T1**. Parents, especially those with many children, are unwilling or cannot afford to contribute to the program (contribution is per child) **T2**. Mindset that school feeding is government's responsibility **T3**. No specific room for eating (refectory) **T4**. Lack of trust or respect for teachers or school feeding committee **T5**. Lack of kitchen materials (makes food preparation time consuming)

The teachers and school administrators we interviewed emphasized the significant benefits the school feeding program has had at improving school attendance and focus in class since its inception. Common challenges they faced were the lack of animal products, fruits, and diverse vegetables in school meals due to low parent contributions. They explained that some parents regard the school feeding program as the responsibility of the government and are discouraged from contributing because they do not trust the motives of the teachers and the school system. Other common frustrations were insufficient cooking materials to meet demand and a lack of designated eating spaces for children, leading to unhygienic classrooms and disruption during class time.When asked how the program could be improved, interviewees suggested scaling up the school garden program and building trust among parents to incentivize higher contributions.

P3-R1. We recommend investing in building or finding designated eating spaces at schools and in acquiring sufficient kitchen and cooking materials to meet demand.
Relevant S,W,O,Ts: **O4; T3, T7**

P3-R2. We recommend increasing collaboration between parents, local leaders, and school teachers to help cultivate trust and, as with the ECD program (see program 1), establishing SLCs to help parents purchase fruits, vegetables, and animal products for school meals and allow them to gain transparency on how and where their contribution is spent.
Relevant S,W,O,Ts: **S1, S2; W1, W2; O1, O2; T1, T2, T4, T5**

P3-R3. We recommend establishing links between schools and FFSs for local procurement and as a resource for agricultural education sessions. By linking the two programs, FFS facilitators could use school gardens as "model plots"for their farmer trainings and the resulting production could be used to improve the quality and diversity of school meals. We also recommend extending the option for parents and teachers to attend some of the trainings when possible to encourage their increased involvement at schools.
Relevant S,W,O,Ts: **W1, W2; O3; T1, T4**

 doi:10.20944/preprints202405.0572.v1

Program 4 (P4). Nutrition-Sensitive Direct Support and Shisha Kibondo (Social Protection Sector)

Nutrition-Sensitive Direct Support (NSDS) is a cash transfer scheme targeting poor households with pregnant women and/or children under 2 years to incentivize them to access essential health and nutrition services. Shisha Kibondo, a fortified blended foods (FBF) that is produced locally, is a maize-corn blend with vitamin/mineral premix provided to pregnant women from vulnerable households or mothers who have a child identified as malnourished for at-home preparation. **Table 7** summarizes participant responses on the benefits and challenges of these social protection programs in the format of a SWOT matrix.

Table 7. SWOT: Nutrition-Sensitive Direct Support (NSDS) and Shisha Kibondo.

STRENGTHS	**WEAKNESSES**
S1. Stunting prevention measures taken before birth and continued into childhood	**W1**. Big families with many children rarely see effects of Shisha Kibondo as they are often distributing the Shisha Kibondo among all children in the household rather than only serving to the malnourished child
OPPORTUNITIES	**THREATS**
O1. Close monitoring through home visits to ensure Shisha Kibondo is properly prepared and consumed **O2**. More holistic support to vulnerable family instead of to just one child **O3**. Administer Shisha Kibondo outside the home, e.g., directly in health facilities or ECDs	**T1**. Provides contradictory messaging to family planning interventions **T2**. Beneficiaries sell Shisha Kibondo rather than consuming it **T3**. Beneficiaries dilute and share Shisha Kibondo among many children at home **T4**. Forgotten age group (support lasts only until 2 years)

A major concern that interviewees raised about NSDS is that, given that mothers are only eligible for the cash transfer during pregnancy and up until their infant reaches 2 years of age, they may be incentivized to become pregnant again to avoid losing the nutritional support. A common criticism among interviewees about the Shisha Kibondo program was the inability to ensure that after distribution, the product is being used properly. Many beneficiaries choose to sell the product instead of feeding it to their malnourished child or dilute it to share among all the children at home. As a result, malnourished children in families with many siblings rarely see the intended effects of Shisha Kibondo. When asked how the program could be improved, interviewees suggested conducting close follow-up to ensure Shisha Kibondo was being administered properly.

P4-R1. To address the concerns surrounding NSDS about incentivizing women to become pregnant, we recommend complementing any monetary support to beneficiaries with targeted education about family planning. We also recommend extending the support until the child reaches three years of age instead of two, at which point children are generally eligible to attend ECDs.

Relevant S,W,O,Ts: **S1; W1; O2; T1, T4**

P4-R2. Currently, Shisha Kibondo is distributed at community health centers at regular growth monitoring sessions for women to take home and administer themselves. We recommend linking the Shisha Kibondo program to ECD centers by training caregivers to administer Shisha Kibondo at ECDs. This could both ensure that mothers and children receive adequate quantities of the product and additionally incentivize pregnant and lactating women to attend ECDs where they could receive other antenatal and postnatal services and counseling. After the first initiation at ECDs, beneficiaries could begin to receive it again for at-home administration but with close and regular follow-up.

Relevant S,W,O,Ts: **S1; W1, O1, O2, O3; T2, T3**

 doi:10.20944/preprints202405.0572.v1

P4-R3. Currently, the quantity of Shisha Kibondo provided to beneficiary households is based on the estimated quantity needed for only one child. We recommend calculating the quantity of Shisha Kibondo provided based on household size (i.e., number of children or household members) instead. This could reduce the likelihood of beneficiaries diluting the product to meet the needs of all family members.

Relevant S,W,O,Ts: **W1, O2, T3**

4. Discussion

The four programs evaluated in this paper represent four entry points to tackle the double burden of malnutrition in Rwanda in four key sectors: health, agriculture, education, and social protection. Although the recommendations are specific to each program and are based on the specific experiences of the interviewees, some common themes are apparent across all evaluated DDA programs in Rubavu and Rusizi and should be priority areas for improvement.

First, interviewees often cited a lack of physical materials, space, or capacity as a barrier limiting an intervention's success. Insufficient or poor quality feed (P2), and insufficient capacity of school kitchens (P3), for instance, all hinder the effective implementation of these programs and should be a first step priority for NICE and other development partners to address for improvement.

Second, a commonly cited barrier among participants was that of shared beliefs concerning nutrition and food. Previous household assessments done in Rwanda in 2019 have confirmed this in their finding that optimal feeding and physical activity practices among children were limited because of cultural beliefs that overweight in children is a sign of good health and that fruits are only meant for wealthy families [23]. Shared beliefs that nutrition programs should be the responsibility of the government (P3), that healthy food is only for the wealthy (P2), and that quantity of nutrition outweighs quality (P4) should be targeted through social behavior change campaigns (SBCCs), interventions proven to be effective in the past at improving dietary practices when combined with nutrition interventions in Rwanda [24].

Third, community educators including teachers, caregivers, FFS facilitators, and community health workers (CHWs) frequently expressed a desire for more trainings to further their education. Increasing the frequency of trainings for caregivers and CHWs on topics of their choice (P1), providing regular refresher trainings for FFS facilitators (P2), and training ECD caregivers to administer Shisha Kibondo (P4) are all steps that can enhance knowledge, motivation, and even empowerment in educators from different sectors who all have a strong impact on their communities.

Fourth, interviewees often explained that nutrition programs were most effective when community members were directly involved and felt a sense of ownership and autonomy in the program. Assigning parents roles and responsibilities at ECD centers (P1) and schools (P3) and assisting them in forming their own SLCs are ways to engage program beneficiaries and increase the likelihood of the programs becoming sustainable without government or donor support.

Fifth, interviewees across all sectors highlighted the importance of close follow-up with program beneficiaries to ensure lessons were being followed and best practices implemented at home. At-home follow-up sessions by ECD caregivers (P1) and regular SMS reminders by FFS facilitators (P2), for instance, are steps that can be taken to incorporate monitoring and follow-up into the respective programs. Importantly, these steps would have to be taken with a specific plan in mind with whom the results of this monitoring would be shared and how they would be used for future program improvement.

As illustrated in **Figure 1**, DDA interventions targeting DBM's shared drivers are still siloed by sector with different authorities responsible for their implementation [6]. Moving forward, it will be important to find synergies between DDAs across sectors to ensure they are not working in isolation or in conflict with one another. Linking schools and FFS for procurement and training purposes (P3) and training ECD caregivers how to administer Shisha Kibondo (P4) are examples of how programs can be linked to engage multi-stakeholder collaboration for mutual benefit.

Finally, it must be acknowledged that the DDA interventions in Rwanda are almost all designed to target women specifically. Shisha Kibondo, ECDs, and NSDS, for example, all directly target

 doi:10.20944/preprints202405.0572.v1

pregnant women or mothers. Even agricultural interventions and educational interventions like the school feeding program focus more on engaging women in the community than men.

Formative consumer research in Rwanda has shown that the cultural norm considers all food-related activities as a woman's duty [25]. Purchasing food, preparing meals, and feeding the family are generally roles assigned to women in the household. Women are also more involved in growing food, with 79.1% of Rwanda's female population engaged in agricultural activities compared to 54.4% of men [26]. However, men in Rwanda are considered the heads of households and hold the final purchasing and decision-making power, thus having a large influence over nutrition and dietary practices at home. Importantly, qualitative assessments of gender roles in nutrition interventions have found that men in Rwanda are interested in learning about nutrition and in receiving training, particularly in male-only spaces [25]. This introduces an important question for further investigation: what can be done to increase the involvement of men in DDA nutrition interventions?

While addressing this issue in depth exceeds the scope of this study, it is important to mention that all four programs discussed can be improved by targeting the involvement of fathers and men, particularly in educational and behavior change efforts.

Strengths and Limitations

This study provides a rare glimpse into local perspectives and insights from an area where qualitative data coverage is generally limited, and adds a valuable piece of research to the sparse literature on DDAs and their implementation [27]. Several key limitations must be acknowledged. First, the selection of programs for evaluation and the relative importance given to the strengths, weaknesses, opportunities, and threats documented was biased by the experiences of the participants interviewed. Second, purposive sampling to select participants is prone to bias as it depends on the researcher's subjective judgment of which professions are most relevant to the study. A SWOT analysis similarly depends on the researcher's judgment in categorizing which factors fall into the four SWOT categories. Another limitation is the possible loss of meaning or context during transcription given that answers were first orally translated from Kinyarwanda to English. Lastly, the focus group discussions were limited by time constraints and low availability of group members. Outside the scope of this study, more rounds of discussion and validation would be necessary to ensure the feasibility, cultural appropriateness, and relevance of the strategies proposed in the paper.

5. Conclusions and Recommendations

Rubavu and Rusizi, two secondary cities in Rwanda's Western province, suffer from higher rates of stunting and overweight and lower dietary diversity than the national average [28]. Rapidly urbanizing areas in LMICs tend to be most at risk of the DBM due to contradictory nutrition policies and siloed governance, compounded by a lack of proper infrastructure and physical capacity [6,29].

This study aimed to evaluate the potential for DDAs in Rwanda's nutrition policies and programs to help tackle the growing DBM in these at-risk areas. Through a desk review and subsequent in-person interviews, we identified twelve programs in Rubavu and Rusizi – four of which were discussed in detail – with DDA potential, and evaluated their local implementation to identify areas for improvement. Findings were summarized into strategy recommendations which were grouped across all interventions into seven strategic actions.

First, we recommend increasing access to the basic physical materials and building the capacity necessary for program implementation. Second, we suggest incorporating mobilization and education components into all interventions to target culturally shared beliefs related to nutrition. Third, we recommend improving the quality of interventions by ensuring community educators attend recurring and reliable trainings. Fourth, we recommend designing interventions to be self-sustaining by increasing community involvement to build a sense of ownership and responsibility. Fifth, we recommend all interventions have a plan for follow-up after program initiation and monitoring the impact after uptake. Sixth, we encourage merging different DDA interventions where there are synergies to avoid siloed governance. Lastly, we recommend taking measures across all

 doi:10.20944/preprints202405.0572.v1

interventions to ensure a more balanced involvement of men and women in matters of household and community nutrition.

Author Contributions: Conceptualization and writing , Sophia Demekas, Helen Prytherch and Dominique Barjolle; ; methodology, Sophia Demekas; data collection, Sophia Demekas, Innocente Turinimigisha, Immaculée Nabacu, and Francine Bayisenge; validation, Straton Habumugisha, Jimena Monro-Gomez, Klaus Kraemer, and Cornelia Speich; review and editing, Sophia Demekas, Dominique Barjolle and Helen Prytherch. All authors have read and agreed to the published version of the manuscript.

Funding: This study took place in the frame of the Nutrition in City Ecosystems (NICE) Project which is supported by the Swiss Agency for Development and Cooperation (SDC) co-financed by a public-private Swiss consortium comprising the Swiss Tropical and Public Health Institute (Swiss TPH), ETH Zürich (Sustainable Agroecosystems Group and World Food Systems Centre), Sight and Life, and the Syngenta Foundation for Sustainable Agriculture.

Institutional Review Board Statement: The study was approved by the Rwanda National Ethics Committee (FWA Assurance No. 000001973) on the 16th of June 2023 and by the ETH Ethics Commission (EK 2023-N-128) on the 28th of June.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Acknowledgments: The authors extend their gratitude to the leadership of the districts of Rubavu and Rusizi for having permitted this study to take place, to Olive Izabayo and Rosine Uwera for their translation and interpretation services, to all key informants who gave their time to take part in the interviews, and to the staff at Sight and Life and Swiss TPH in Kigali, namely Elvis Gakuba and Jocelyne Ingabire for their input.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A. DDA Interventions by Program

A detailed summary of which actions by document qualified as DDAs is provided in Appendix A.

 doi:10.20944/preprints202405.0572.v1

Fourth Health Sector Strategic Plan 2018-2024						
Priorities by Services, Programs, and Health Systems	Health Services	Social Safety Nets	Educational Setting	Agriculture	Food Environments	10 Priority Candidates
Chapter 4.1 Health Services and Programs Across the Life Cycle						
4.1.1 MCCH (Pregnancy, Early Life, and Children)						
Improve and sustain quality of MCH (maternal child health) services	X					1,3
Increase ANC and postnatal care uptake	X					1
4.1.2 Nutrition						
Community education and awareness on dietary and complementary feeding practices	X					3
Establishment and use of ECDs as entry point of provision health interventions (specifically nutrition)	X					1,3,4,5
Prevention and management of malnutrition (acute and chronic)	X					1,3,4
3.4.1 Strategies for mainstreaming NCDs in various sectors						
a. Education Sector						
Integrate NCD prevention and control in school curricula at various levels of education	X		X			5,7
c. Agriculture Sector						
Ensure production of healthy food crops (fruit, vegetables, cereals and other sources of healthy food)				X		8,9
h. Trade and industry sector						
Regulate the trade of processed food and beverages		X			X	6,10
Maternal Newborn and Child Health Strategic Plan 2018-2024						
Key Priorities by Strategic Intervention	Health Services	Social Safety Nets	Educational Setting	Agriculture	Food Environments	10 Priority Candidates
Strategic Objective 1. Universal access to quality MNCH services for all citizens						
Key Implementation Priorities						
Maternal and child nutrition: maternal pre- and during pregnancy and post-partum; child nutrition especially between 6-24 months	X					1,2,3,5
Stunting prevention: coordinate with the National Food and Nutrition Secretariat on implementation priorities (promotion and implementation of services, interventions and practices that prevent stunting during the 1st 1000 days of life; micronutrient supplementation; timely identification and treatment of undernutrition)	X					1,2,3,4
Strategic Objective 3. Enhanced community health literacty, skills and practices through social, behavioral and community engagementn efforts to improve equitable MNCH						
Key Implementation Priorities						
Complementary feeding among 6-24 months	X					3
Strategic Objective 4. Available, accessible, acceptable and high quality MNCH workforce developed and enforced at all levels of service delivery						
Key Implementation Priorities						
Maternal, newborn and child nutrition	X					1,3
Antenatal care (8 contacts) - including counseling and care in early pregnancy	X					1
National Agriculture Policy 2018						
Outcomes and Policy Actions by Pillar	Health Services	Social Safety Nets	Educational Setting	Agriculture	Food Environments	10 Priority Candidates
Pillar 2: Technological Upgrading and Skills Development						
Outcome: Technological upgrading and capacitated farmers and rural value chain actors who make informed decisions and profitably engage in off-farm activities						
2.3 Promote research on nutrient-rich crops through bio-fortificaiton, to position Rwanda as a trusted source of bio-fortified food for the region				X	X	9,10
2.19 Promote research on diversified animal products				X		8
2.29 Focus on domestic market research on identifying dietary gaps, mapping consumption patterns and the links with production, trade analysis, impact of regulations				X	X	8,10
2.44 Broaden the public extension services to include business orientation, nutrition, gender and savings, using weather and climate information, IMP and climate smart agriculture				X		8
2.52 Provide targeted support to women to access suitable financial products for income-generating on-farm and off-farm activities				X		8
2.53 Support access to start-up funds for women to start or grow their agribusiness enterprises				X		8
Pillar 4. Inclusive Markets and Off-Farm Opportunities						
Outcome: Improved inclusiveness of agricultural market systems and increased value addition and competitiveness of diversified agriculture commodities for domestic, regional,						
4.10 Develop household nutrition guidelines	X					5
4.11 Develop practical skills training from local Community Health staff, extensionists, and Farmer Field Schools	X			X		3,8
4.12 Expand and revise kitchen garden programs				X		8,9
4.13 Scale up the availability of bio-fortified foods					X	10
4.14 Coordinate with social protection programs to asset building mechanisms (distribute small livestock, access to inputs)		X		X		6,8
4.15 Promote local procurement of diversified nutritious foods for school meals			X			7
4.16 Mainstream and coordinate efforts to identify and address specific dietary gaps through direct investments in agriculture and rural development				X		8
4.20 Expand the body of publicly available data on prices and production and facilitate market linkages between smallholder farmers, cooperatives, traders, and the processing industries					X	10
National Comprehensive School Feeding Policy 2019						
Recommended Policy Actions	Health Services	Social Safety Nets	Educational Setting	Agriculture	Food Environments	10 Priority Candidates
5.1 Scale up the coverage of school feeding programs						
Universal coverage of school feeding programs for pre-primary, primary, and secondary school children (including private schools, which prior was not the case past primary school) thorugh increased government subsidies and parents' contribution			X			7
Vulnerable children (e.g. orphans and OVC) and children from vulnerable households (Ubudehe 1 and 2) are exempt from parent requirement to contribute for feeding			X			7
5.2 Ensure health and nutrition sensitive school feeding programming						

 doi:10.20944/preprints202405.0572.v1

MINEDUC will work with Nutrition and Food Technologist to develop a guide on a school menu that ensures nutritious meals with sufficient macro and micronutrients			X			7
Guidelines on how to develop appropriate food menu (include fresh food in food baskets) will be developed by MINEDUC			X			7
School feeding program accompanied by comprehensive package of complementary interventions: water, sanitation, hygiene facilities; health, nutrition, hygiene education; systematic deworming; micronutrient supplementation; psychosocial support; energy saving stoves and clean cooking			X			7
MINEDUC to develop guidelines for minimum requirements for school feeding requirements (infrastructure and equipment required)			X			7
5.3 Promotion of school gardening and farming						
School gardening and farming programs will act as educational forum for children and parents and increased production for school feeding			X	X		7.8
MINAGRI will define minimum package and provide support to school gardening and farming			X	X		7.8
Parents of targeted school children will be involved in the management of school gardens and farming			X	X		7.8
Food production from gardens/farms will be added to school feeding basket when available			X	X		7.8
5.5 Create appropriate policies and frameworks linking market access to farm produce by local farmers to the school feeding programs using unconventional procurement						
School feeding programs will be linked to locally produced food for long-term food and nutrition security and community development			X	X		7.9
MINEDUC will develop appropriate supply chain or procurement model with detailed guidelines to ensure transparent, efficient and accountable approach from local farmers using unconventional procurement method			X	X		7.9
National Early Childhood Development Policy (NECDP) Strategic Plan 2018-2024						
Key Strategic Interventions by Priority Area and Pillar	Health Services	Social Safety Nets	Educational Setting	Agriculture	Food Environments	10 Priority Candidates
Strategic Direction 2. Improved and sustained quality health and nutrition status of infants and young children in first 1000 days of life						
Outcome 2. Increased, equitable access to high impact, evidence-based health, nutrition, family planning and reproductive health services at primary and community level to						
1. Promote 4-8 antenatal care visits and integrate/strengthen surveillance and prevention of malnutrition as part of antenatal care	X					1,4
3. Support for early initiation and exclusive breastfeeding	X					2
4. Support continued breastfeeding up to 24 months and appropriate complementary feeding	X					2,3
6. Establish and strengthen mechanisms to address anaemia among adolescent girls	X					5
7. Strengthen growth monitoring and promotion at health facility and community levels, including Intervention and referral	X					4
8. Roll-out the child length mat to support visualization and early detection of stunting	X					4
9. Strengthen the quality and coverage of Maternal Infant and Young Child Nutrition counselling (individual and group counselling) through existing opportunities such as ANC (antenatal care), PNC (post-natal care), immunization sessions, and IMCI (Integrated Management of Childhood Illness), targeting all care providers (mothers, fathers and caretakers)	X					1,2
10. Build capacity of health care providers for identification, quality care/treatment, referral, and follow up after discharge of moderate and severe acute malnutrition	X					4
14. Improve nutrition practices and education in schools (primary & secondary) and ECD facilities			X			7
Strategic Direction 4. Improved and sustained equitable food security for family health in vulnerable households with pregnant and/or lactating women						
Outcome 4. Enhanced availability and accessibility of quality, nutrient-rich and diversified food in targeted households, and improved consumption practices						
1. Increase local food production among vulnerable households of nutrient dense rich foods for own consumption (all-year productive kitchen gardens, fruit trees)				X		8,9
2. Scale-up planting of nutritious trees and processing of their produce to mitigate the existing gaps in micronutrients with a focus on Spirulina and moringa among others				X		8
3. Increase coverage of vulnerable households supported to produce animal sourced foods for own consumption				X		8
4. Sustain Effective Food Consumption practices in vulnerable HH	X			X		5,8
5. Increase access to fortified foods to vulnerable households	X				X	5,10
7. Scale-up food fortification and bio-fortification efforts (protein iron rich beans, orange sweet potatoes, widely consumed food stuffs).					X	10
Strategic Direction 5. Improved social protection systems for the poor and most vulnerable households						
Outcome 5. Increased access to and use of social protection services by targeted households to ensure adequate nutrition and access to IECD (Integrated Early Childhood						
Output 5.2 Improved coverage, adequacy and appropriateness of social protection for reducing malnutrition, including nutrition-sensitive direct support, alternative income opportunities, food assistance and awareness raising on health, hygiene, and nutrition		X				6
Strategic Direction 7. Strengthened community-based platforms to enhance demand for and use of effective frontline service delivery system of integrated high quality high						
Outcome 7. Strengthened community-based platforms to enhance demand for and use of quality, integrated frontline ECD services						
4. Improve quality of measurements and reporting systems for child growth monitoring and promotion at community level	X					4
5. Strengthen community based nutrition programs including nutrition education counselling	X					3,5
a. Review and operationalize community-based screening and early identification systems of children at risk, including adoption of new methods (innovative Growth Monitoring and Promotion GMP at community level)	X					4
c. Scale up a package of prioritized community-based nutrition interventions to prevent and manage malnutrition in children less than 5 years, with a focus on those aged less than 2 for stunting and pregnant and lactating mothers	X					1,2,3,4
National Food and Nutrition Policy Strategic Plan 2013-2018						
Key Outputs and Activities by Strategic Direction	Health Services	Social Safety Nets	Educational Setting	Agriculture	Food Environments	10 Priority Candidates
Strategic Direction 2. Prevent Chronic Malnutrition						

 doi:10.20944/preprints202405.0572.v1

Output: Families and officials across Rwanda know and give value to the first 1000 days						
Create national awareness on First 1000 Days around 1st 1000 days through national mass media, district media, organizational and non-formal channels	X					3
Effectively communicate the knowledge on the services and practices needed to protect children from stunting through a multichannel mix (mass, group and interpersonal) and formal education for families and caregivers throughout the country	X					1,2,3,4
Output: Monthly 1st 1000 Days Community Based Food and Nutrition Programs with monthly sessions effectively balance anthropometric tracking with a wide range of						
Organize and conduct monthly 1st 1000 days community based food and nutrition program activities including growth promotion activities with integrated early childhood (IEC) discussions with topics covering range of interventions to prevent stunting with participation from all pregnant women and families with children under 2 to participate	X					1,2,3,4
Design and implement at household level promotional activities including kitchen garden, small animal husbandry and production of staple foods				X		8
Strategic Direction 3. Improving Household Food Security						
Output: Households increasingly diversify their food production						
Establish village nurseries for fruit and agroforestry trees				X		8
Support development of homestead garden				X		8
Support development of small livestock				X		8
Establish model for nutrition gardens at village level				X		8
Provide food to very vulnerable groups (community kitchen programs)		X		X		6,8
Output: Improve nutrition-related agricultural knowledge/practices of households						
Prepare in Kinyarwanda "Book of nutritious local recipes" and disseminate locally	X			X		5,8
Contribute to updates of 1st 1000 Days Campaign	X			X		1,3,8
Output: Income generating capacities of food and nutrition insecure households support						
Provide technical and financial assistance to vulnerable households in greenhouse farming				X		8
Provide technical and financial assistance to vulnerable households in commercial vegetable and fruit production				X		8
Output: Availability, affordability and quality of nutritious food improved						
Provide extension and input support to producers of fortified beans and maize seeds and sweet potato vine				X	X	8,10
Implement national campaign for planting and consuming biofortified foods				X	X	8,10
Publicize the benefits of milk consumption for children	X			X		5,8
Support entrepreneurs to develop innovative milk products and packaging		X		X	X	6,9,10
Output: Increased access to and use of appropriate food for most vulnerable households						
Households of Ubudehe categories 1 and 2 targeted for nutritious complementary food during 1st 1000 days periods	X	X				3,6
Households of Ubudehe categories 1 and 2 targeted for direct cash transfers during 1st 1000 Days periods		X				6
Small livestock and seeds to Ubudehe categories 1 and 2 during their 1st 1000 Days periods		X		X		6,8
Strategic Direction 4. Prevention and management of all forms of malnutritoin						
Output: Continued and strengthened activities to promote lowering of acute malnutrition						
Build capacity for active identification and management of acute malnutrition through health facilities, routine and annual screening, referral and reporting based on growth monitoring and promotion in the 1st 1000 days campaign	X					4
Build capacity of health care providers at health facilities and CHWs on management of severe acute malnutrition through trainings and supportive supervision	X					4
Output: Maternal Infant and Young Child Nutrition (MIYCN) effectively promoted						
Reinforce optimal MIYCN through antenatal care visits, during health facility birth stays and throughout first two years by CHWs and health care providers at all levels and 1st 1000 Days campaign	X					1,3
Output: Improve micronutrient nutrition						
Conduct gap analysis on Fe+FA supplementation of pregnant women	X					1,5
Improve Fe+FA supplementation coverage and compliance for pregnant women and link to 1st 1000 days campaign	X					1,5
Sustain vitamin A supplementation in children > 5 and lactating women	X					5
Implement nationally new strategies to reach children 6-24 months of age with sufficient iron (in-home fortification using MNP and commercially fortified complementary cereals)	X					3,5
Promote and monitor implementation of 2013 regulation requiring staples foods fortification					X	10
Promote wide and rapid adoption and use of appropriate biofortified crops					X	10
Promote growing and use of mushrooms and highly nutritious crops				X	X	8,9,10
Output: Prevention of obesity strategy developed and alliances formed to address growing prevalence of overnutrition and nutrition-related non-communicable diseases						
Develop national strategy for obesity prevention	X	X			X	5,6,10
Create "Rwanda Alliance Against Obesity" with government, NGOs, RNS, civil society, private sector	X	X			X	5,6,10
Develop Rwanda Dietary Guidelines with adaptations for groups with different nutritional requirements including recommendations for physical activity	X					5
Strategic Direction 5: Improving food and nutrition in schools						
Output: Food and nutrition education has been substantially expanded throughout school curriculum and extra-curricular activities						
Conduct curriculum gap analysis focused on key elements of food and nutrition and life skills including 1st 1000 days			X			7
Develop curricular and extracurricular age appropriate learning modules and activities expand food and nutrition learning components (urban vs. rural settings to be considered)			X			7
Produce and disseminate learning materials along with appropriate in service training of teachers on new learning modules/activities			X			7
Incorporate food and nutrition learning package into pre-service training of teachers			X			7
Implement school gardens and "grow areas" as pedagogical tools for learning teaching about food and nutrition			X	X		7,8

 doi:10.20944/preprints202405.0572.v1

Link school teaching and activities on food and nutrition with the key concepts, services and practices of the 1st 1000 Days campaign and community based nutrition programmes			X			7
Output: The implementation of school feeding program has been expanded countrywide						
Expand the "one cup of milk per child" in collaboration with MINAGRI		X	X			6,7
Operationalize and Institutionalize home-grown school feeding program			X			7
Sustain and improve the secondary boarding school feeding model			X			7
Output: The School Health Policy has been implemented						
Develop program to screen preschool and school children for malnutrition	X		X			4,7
Provide micronutrient supplements (vitamin A) to children under 5 in preschool	X		X			5,7
Collaborate with MOH on national strategy to eliminate anemia target groups particularly girls in secondary school (weekly campaign Fe+FA)	X		X			5,7
National Social Behavior Change and Communication Strategy for Integrated Early Childhood Development, Nutrition and WASH 2018-2024						
Priority Behaviors to Promote	Health Services	Social Safety Nets	Educational Setting	Agriculture	Food Environments	10 Priority Candidates
Adult Nutrition						
Increase awareness that women of reproductive age, particularly pregnant and lactating women should eat meals four times each day that contain foods from at least four food groups out of seven food groups (demand).	X					1
Address taboos related to food and promote correct knowledge	X					5
Address food insecurity and rising price of nutritious food (access and resilience).		X		X		6,9
Promote reduced consumption of energy-dense food high in saturated fats and sugars, and increase physical activities among those who are obese.	X	X			X	5,6,10
Infant and Young Child Nutrition						
Promote good infant and young child feeding practices with a focus on quality of food as opposed to only the quantity of food; address resource allocation and prioritize nutritious food for children.	X					3
Promote optimal breastfeeding and early initiation of breastfeeding (within 30 min after delivery) and emphasis on colostrum.	X					2
Encourage adequate and timely complementary feeding to young children between 6 and 23 months.	X					3
Educate about minimum meal frequency; Minimum dietary diversity; adequate amount of food and consistency, active/responsive feeding, exclusive breastfeeding (not giving any other foods or liquids to infants besides breastmilk in the first 6 months of life).	X					2,3
Health seeking behavior						
Raise awareness to parents and caregivers to responsive child feeding practices	X					3
Promote regular attendance to the monthly growth monitoring and promotion sessions to assess the growth of the child.	X					3,4
Educate mothers and caregivers of children under 5 about the importance of complying with the instruction on how to give micronutrient powders to eligible children.	X					5
Promote full attendance at ANC/PNC visits	X					1

National School Health Strategic Plan 2014						
Activities by Strategic Objectives	Health Services	Social Safety Nets	Educational Setting	Agriculture		10 Priority Candidates
Strategic Objective 5. Promotion of School Nutrition						
Operationalize home-grown school feeding program (HGSFP) at all schools (pre-primary, primary, and secondary schools)			X			7
Continue other school feeding interventions (One cup of milk per child, secondary school feeding program)			X			7
Supplementation of micronutrients bi-annually (vitamin A) in schools	X		X			5,7
Promotion of nutrition education through school gardens			X	X		7,8
Strategic Objective 6. Promotion of Physical Education						
Strengthening of physical education and sports curriculum in schools (train PE/sports teachers in life skills and involve PTAs/local communities in implementation)			X			7
Promotion of sports activities to raise awareness (campaigns)			X			7
National Strategy and Costed Plan for the Prevention and Control of Non-Communicable Diseases in Rwanda 2020-2025						
Strategic Actions by Strategic Objective and Priority Areas	Health Services	Social Safety Nets	Educational Setting	Agriculture	Food Environments	10 Priority Candidates
Strategic Objective 1. NCD Prevention through health promotion and reduction of risk factors						
Priority Area 1. Awareness-raising/education to reduce exposure to modifiable NCD risk factors						
Establish a school health program for NCDs including injuries and disabilities increasing awareness and preventions as part of primary and secondary school curriculums	X		X			5,7
Promote community awareness of prevention of NCD risk factors	X					5
Empower districts to run NCD prevention and education programs	X					5
Develop and disseminate NCD prevention communication material targeting general population. These should focus on balanced diets, reducing alcohol consumption, promoting physical activities and reducing tobacco addiction	X					5
Develop and integrate NCD-related education and awareness messages into package of service provided by all levels of health care and community health workers	X					3
Priority Area 3. Establish and strengthen the implementation of policies and regulations addressing NCD risk factors						
Establish regulations or policies related to healthy diets (e.g. trade of trans-fats, sugary beverages, processed food and sodium)		X			X	6,10
Conduct public awareness campaigns, including mass and social media, to inform and engage consumers about healthy diets based on locally available food and drink	X			X	X	5,9,10
Promote user-friendly or easy-to-understand food labelling on processed food packaging and translate international food labels into local languages		X			X	6,10
Reduce sugar consumption through increased taxation on sugar-sweetened beverages		X			X	6,10
Raise community awareness of healthy diets, including salt consumption	X				X	5,10
Promote farming with controlled use of agrochemicals, ensuring crop diversity, and cultivating fruits and vegetables				X		8
Develop and disseminate guidelines for the general population on physical activity and sports					X	10

 doi:10.20944/preprints202405.0572.v1

Create enabling environments for promoting physical activity (e.g. road design and recreational spaces)					X	10
Increase general awareness on physical activity and benefits					X	10
Strategic Objective 2. Strengthening health systems for quality NCD early detection, care and treatment at all levels						
Priority Area 1. Human resources development for NCD early detection, care and treatment						
Train in-service health providers in early detection, diagnosis and management of NCDs including injuries and disabilities at all levels	X					3
Integrate national NCD prevention, early detection, care, and treatment guidelines into undergraduate pre-service training of the health workforce	X					3
National Strategy for Transformation (NST1) 2017-2024						
Key Strategic Interventions by Priority Area and Pillar	Health Services	Social Safety Nets	Educational Setting	Agriculture	Food Environments	10 Priority Candidates
Social Transformation Pillar						
Priority Area 1. Promoting resilience and enhanging graduation from poverty and extreme poverty						
Improve the management of the One Cow per Poor Family (Girinka) Program and other social programs run at the village level and support poor households to acquire small livestock.		X		X		6,8
Priority Area 2. Eradicating Malnutrition						
Ensure and sustain food security by distributing food and vitamin supplements using Fortified Blended Food (FBF) and one cup of milk per child	X	X				5,6
Promote at village level the 1000 days of good nutrition and antenatal care by sensitizing households on good nutrition and hygiene practices through ECDs, health centers, and faith based campaigns	X					1,3,5
Priority Area 3. Enhancing demographic dividend through ensuring access to quality health for all						
Strengthen disease prevention awareness and reduce communicable and non-communicable diseases (NCDs) through community mobilization to prevent diseases through maintaining hygiene, promoting physical exercises for all age groups, regular health checkups and scaling up screening services in communities and health facilities	X					4
National Social Protection Sector Strategic Plan (SP-SSP) 2018-2024						
Priority Actions by Outcome	Health Services	Social Safety Nets	Educational Setting	Agriculture	Food Environments	10 Priority Candidates
Outcome 2. Strengthened contribution of social protection to reducing malnutrition						
Nutrition sensitive direct income support provided to extremely poor mothers and infants		X				6
Develop guidelines delivery of sensitization on nutrition to ePW HBCC beneficiaries		X				6
Design behavioral change communication strategy (BCCS) to accompany VUP implementation		X				6
Rubavu District Plan to Eliminate Malnutrition (DPEM) 2022-2023						
Activities by Output and Strategy	Health Services	Social Safety Nets	Educational Setting	Agriculture	Food Environments	10 Priority Candidates
Strategy 2. Prevent stunting in children under two years of age						
Output 1. Ensure community awareness and promote ECDs to prevent stunting among children under 2 years						
Conduct nutrition and breastfeeding weeks	X					2,3
Coordinate Maternal Child and Community Health week	X					3
Conduct behavior change positive preventing sessions through home visitations	X					3
Output 2. Provide nutrition sensitive direct support						
Pay of beneficiaries (pregnant women and U2 children in Category 1) with NSDS (Nutrition-Sensitive Direct Support)		X				6
Conduct mobilization at community level on importance of 4 ANC standard visits by community health workers	X					1
Conduct screening of U2 children using Length Mat (stunting) in the community	X					4
Conduct screening of U5 children using MUAC (wasting) in the community	X					4
Strategy 3. Strengthen, expand, and promote services and practices that result in household food security year round						
Output 1. Households increasingly diversity their food production						
Distribute diversified seeds to ECD center				X		8
Strategy 4. Prevent and manage all forms of malnutrition						
Output 1. Continued and strengthened activities to reduce acute malnutrition						
Establish kitchen gardens to home based ECD				X		8
Screen pregnant women in all health centers	X					1
Output 2. Maternal Infant and Young Child Nutrition effectively promoted through providing holistic health and nutritional commodities						
Provide nutrition support (milk to U5 children with malnutrition)		X				6
Provide FBF (fortified blended food) to children aged 6-23 months (Category 1 and 2)	X	X				5,6
Provide folic acid and iron supplements to pregnant women	X	X				1,5,6
Provide nutritional supplements to children	X					5
Strategy 5. Strengthen nutrition education in schools and higher learning institutions through curricular and extracurricular activities						
Output 1. Food and nutrition education has been substantially expanded throughout school activities						
Conduct monitoring of the availability and sustainability of school gardens				X		8
Rusizi District Plan to Eliminate Malnutrition (DPEM) 2022-2023						
Activities by Output and Strategy	Health Services	Social Safety Nets	Educational Setting	Agriculture	Food Environments	10 Priority Candidates
Strategic Direction 1. Children healthy and able to thrive						
Output 1: Maternal, Infant and Young Child Nutrition (MIYCN) effectively promoted through providing holistic health and nutritional commodities						
Provide FBF to children under 2 years (Categorie 1&2)	X	X				5,6
provide Iron and Folic Acid to pregnant women	X	X				5,6
Provide FBF to pregnant and lactating women in Categories 1 and 2	X	X				1,5,6
Provide nutritional supplement to children (MNP, Vit A, RTUF, Ongera, etc.)	X	X				5,6
Screen children under 5 years for all forms of malnutrition with MUAC, height, length, weight, length mat	X					4
Transportation of FBF to additional sites	X	X				5,6
Conduct monthly growth monitoring of childrens under 5	X					4
Monitor the screening of children using LENGTH MAT	X					4
Strategic Direction 2. Young children learn and reach their development potential						
Output 1: Food and nutrition education has been substantially expanded throughout school and Health facilities; curriculum and extra-curricular activities						
Monitor the availability and sustainability of school gardens in all schools			X			7

 doi:10.20944/preprints202405.0572.v1

Output 2. Maternal Infant and Young Child Nutrition effectively promoted through providing holistic health and nutritional commodities						
Provide ECDs with food and Porridge and basic learning materials	X		X			3.7
Organize and conduct the training of caregivers (Home and community based ECDs)	X					3
Strategic Direction 3. Children are food secure and have a minimum standard of living						
Output 1. Local production of nutrient dense food crops among targeted HHs for own consumption through use of subsidiaries agricultural inputs (Fruit trees, Bio fortified						
Construction of 2 model kitchen gardens in each village				X		8
Provide inputs (Seeds and Fertilisers)		X		X		6.8
Provide Fruit plants to vulnerable families		X		X		6.8
Strategic Direction 6: Integrated frontline delivery						
Organize and conduct radio talk shows on first 1000 Days of child life, balanced diet, breast feeding and hygiene practices	X	X				1,2,3,4,6
Growth screening and monitoring and basic food supplementation at village level	X					4,5
Organize and implement SBCC and cooking demonstrations at village level	X	X				3,6
Conduct home visits that include counseling on nutrition, WASH, and ECD Services as recorded on new checklist by CHWs	X					3
Rwanda Agriculture and Animal Resources Development Board (RAB) Strategic Plan 2020						
Strategic Objectives by Outcome	Health Services	Social Safety Nets	Educational Setting	Agriculture	Food Environments	10 Priority Candidates
Outcome 2. Increased productivity, nutritional value, and resilience through sustainable, diversified, and integrated crop, livestock, and fish production systems						
Promotion of nutrition sensitive agriculture (chicken, pigs, cows distributed)				X		8
Increasing kitchen gardens and school gardens			X	X		7,8
Promoting production and consumption of highly nutritious fruits and vegetables				X		8
Strategic Plan for the Transformation of Agriculture Phase III (PSTA IV) 2018-2024						
Activities by Strategic Outcome	Health Services	Social Safety Nets	Educational Setting	Agriculture	Food Environments	10 Priority Candidates
1.3 Skills developed for agriculture value chain actors						
1.3.3 Women empowerment and skills development						
Capacity building for developing skills and promoting increased involvement of women in agribusiness				X		8
Capacity building for developing leadership and management skills for women				X		8
2.4 Nutrition sensitive agriculture						
2.4.1 Mainstreaming nutrition						
Training of MINAGRI, RAB, and NAEB staff on NSA mainstreaming				X		8
Promote nutrition dense food e.g. iron fortified beans				X		8
Promote PPP models for food fortification				X	X	8,10
Nutrition education for farming households				X		8
2.4.2 Upscaling of kitchen gardens program and home-grown school feeding program						
Technical assistance for expanding kitchen garden program to promote more diversified diets at household level				X		8
Promote urban agriculture and agro-forestry (fruit trees, vegetables, small stock, fish ponds) program				X		8
Pilot nutrition campaigns in kitchen gardens				X		8
Subsidize kitchen gardens				X		8
Develop and expand school gardens			X	X		7,8
Source locally produced food for school feeding program			X	X		7,8
Contribute in the development of school curriculum with integrated nutrition education			X	X		7,8
2.5 Mechanisms for increased resilience						
2.5.2 Asset building for vulnerable groups						
Support vulnerable groups with chicken transfer, pig transfer		X		X		6,8
Girinka program		X		X		6,8
Asset transfer of other small-stock (goats, rabbits)		X		X		6,8

Appendix B. Interview Guide English-Kinyarwanda

HEALTH SECTOR INTERVIEW GUIDE / Umuyoboro w'ibazwa ku rwego rw'ubuzima

Health Sector Potential Interviewees:/**ABABAZWA B'INGENZI MU RWEGO RW'UBUZIMA**

- Directors of Health/**Umuyobozi ushinzwe ubuzima** (Rubavu and Rusizi Districts/**Akarere ka Rusizi na Rubavu**)
- ECD District Focal Points, Caregivers, Volunteers/ **Abayobozi b'ibanze bashinzwe amarerero y'incuke, abarezi n'abakorerabushake**
- Community Health Workers (CHWs)/**Abakozi bita k'ubuzima**
- Antenatal care providers/**Abita ku bagore batwite**
- Health-related NGO and FBO Representatives (ADEPE, African Evangelical Enterprise) **Imiryango itegamiye kuri leta yita k'ubuzima, abahagarariye imiryango ishingiye ku kwemera (ADEPE, Abashoramari mu ivugabutumwa Nyafurika**
- World Vision Rwanda members/**Abanyamuryango ba World vision Rwanda**

A. Stunting and wasting (undernutrition) in children under 5/Igwingira n'imirire mibi mu bana bari munsi y'imyaka 5

A1. *Assessing the Nutrition Problem/* ***Gusuzuma Ikibazo cy'imirire***

A1.1 In your experience, how common is stunting and/or wasting in children under 5? /**Mu bushishozi bwawe, Ubona hari igwingira n'imirire mibi mu bana bari munsi y'imyaka 5?**

If yes: Which children do you think are most affected? What do you think are the biggest contributing factors?

 doi:10.20944/preprints202405.0572.v1

/Niba ari yego, ni abahe bana utekerezeko bagirwaho ingaruka nabyo? utekereza ko biterwa niki?
If no: Please explain your view. Recent improvements or intervention successes? / **Niba ari oya, gerageza usobanure uko ubyumva. Igiheruka kugerwaho cyangwa igikorwa cyagezweho neza.**

A1.2 Have you seen recent improvement or worsening of these conditions? /**Hari impunduka nziza ubona cyangwa igituma biba bibi kurushaho muri iki kibazo?**
If yes: What do you think were the drivers of this change? /**Niba ari yego, utekereza ko ari iki gituma habaho izo mpinduka?**

A2. *Evaluating Interventions*/***Gusuzuma ibikorwa***
A2.1 Are you aware of specific policies or programs that have been successful at targeting stunting and wasting (undernutrition) in children under 5? /**Waba uzi politiki cg gahunda yihariye yagezweho mu gukumira igwingira n'imirire mibi mu bana bari munsi y'imyaka 5?**
If yes: What has made these interventions successful? /**Niba ari yego, niki cyatumye ibyo bikorwa bigerwaho neza.?**

A2.2 Please review the relevant policies and programs identified through our desk review (below). Out of those listed, which interventions are you directly involved with? / **Gerageza usuzume politiki na gahunda bifitanye isano byagaragajwe binyuze mu isuzuma ryacu(hepfo), muri uru rutonde ni ubuhe buryo wagizemo uruhare?**
Prompt: Please describe your experience working in this intervention. / **Gerageza usobanure imikoranire yawe niyi gahunda?**
Prompt: What works the best? What works the least? / **Ni iyihe ikora neza cyane? Ni iyihe idakora neza?** *Prompt*: What do you consider the biggest challenges**? / Ni iyihe mbongamizi nyamukuru wahuye nayo?** *Prompt:* What do you think could be done to improve it? / **Ni iki utekerezako cyakorwa ngo bigende neza kurushaho?**

A2.3 Are there any other interventions targeting undernutrition in children under 5 that you're involved with that are not listed here? / **Haba hari indi gahunda cg igikorwa cyo gukumira igwingira n'imirire mibi mu bana bari munsi y'imyaka 5 wagizemo uruhare kitari mu byavuzwe hano?**
If yes: Please describe your experience working in this intervention. /**Niba ari yego, gerageza usobanure imikoranire yawe nicyo gikorwa**

Relevant Interventions Identified by Desk Review/ibikorwa bifitanye isano byasuzumiwe hamwe
Antenatal and post-natal care visits and counseling (nutrition, supplementation, breastfeeding, child feeding, positive parenting**) / Gahunda yo kwita k'umugore utwite, gusura umugore ukimara kubyara no kumugira inama (kubijyanye n' imiririre myiza, imfashabere, konsa, kugaburira umwana, no kurera neza)**
Growth monitoring and screening of children under 5 at health centers **/ Gahunda yo gukurikirana no kugenzura imikuririre y'abana bari munsi y'imyaka 5 ku kigonderabuzima**
Vitamin A supplementation to lactating women/ **Guhabwa inyongera ya vitamin A ku bagore bonsa**

 doi:10.20944/preprints202405.0572.v1

Iron and folic acid supplementation to pregnant women (ANC visits)/ **Guhabwa inyongera y' ubutare (feri) ku bagore batwite**
Iron supplementation to children 6-24 months / **Guhabwa inyongera y ubutare (feri) ku bana bari hagati y'amezi 6 na 24**
Distribution of fortified blended foods (Shisha Kibondo by Africa Improved Foods) to Ubudehe Category 1 and 2 households/**Gahunda yo gutanga Shisha Kibondo ku ngo ziri mu kiciro 1ni cya 2 cy'ubudehe.**
Nutrition education and counselling (ECDs, health centers, FBOs) /**Inyigisho kumirire myiza n'inama (ku Marerero y'incuke, ku bigonderabuzima, ibigo bishingiye ku kwemera)**
Home visits including counseling on nutrition, WASH, and ECD services/**Abantu basura ingo batanga inama ku mirire myiza, isuku na serivisi z'amarerero y'incuke.**
Food and porridge provided at ECDs/ **Gutanga ibiribwa n'igikoma ku marerero y'incuke.**
Awareness Campaigns: 1000 Days, Day of African Child, World Breastfeeding Week, Maternal and Child Health Week / **Ubukangurambaga ku'minsi igihumbi, umunsi w'umwana w'umunyafurika, icyumweru cyahariwe konsa, icyumweru cyahariwe ubuzima bw'umwana n'umubyeyi.**
In-home fortification: MNPs, complementary cereals / **Gukora imvange z'intungamubiri y'ibinyampeke mu rugo.**
Rwanda Alliance Against Obesity/Obesity prevention programs / **Ihuriro Nyarwanda mu gukumira umubyibuho ukabije**
NCD prevention and education programs /**Gahunda yo gukumira no kwigisha indwara zitandura**
One Egg per Child, Everyday/**Gahunda y'igi kuri buri mwana buri munsi**

B. Exclusive breastfeeding until 6 months/ Konsa umwana amezi 6 ntakindi umuvangiye

B1. *Assessing the Nutrition Problem*/***Gusuzuma Ikibazo cy'imirire***

B1.1 In your experience, how long do women usually exclusively breastfeed after birth? **Mu bushishozi bwawe, ubona ababyeyi bakunda konsa abana igihe kingana gite ntakindi babavangiye Nyuma yo kubyara?**

Prompt: Which types of women are most/least likely to do so (e.g. young/old, urban/rural)? **Ni abahe bagore bakunda kubikora (urugero: abagore bakuze, bakiri bato, abagore bo mu cyaro cyangwa abagore bo mu muyji?**

B1.2 In your experience, are women aware of the benefits of exclusive breastfeeding for 6 months after birth?

/Mu bushishozi bwawe, ubona abagore bazi akamaro ko konsa umwana amezi 6 akivuka ntakindi amuvangiye?

If yes: Where do most women receive this information? **/ Niba ari yego, ni hehe abagore bahabwa ayo makuru?**

 doi:10.20944/preprints202405.0572.v1

B1.3 In your opinion, why do some women stop breastfeeding exclusively before 6 months? / **Ku bwawe, ni ukubera iki abagore bahagarika konsa abana mbere igihe cy'amezi 6 ntakindi babavangiye?**

B1.4 Are you aware of any breastmilk substitutes sold or promoted in your city/district? **Waba hari imfashabere uzi zicuruzwa cyangwa zatejwe imbere mu mujyi/Akarere kawe?**
If yes: How popular do you think these substitutes are? **Niba ari yego, utekerezako izo mfashabere zizwi bingana iki?**
If yes: Do you think their availability contributes to lower rates of exclusive breastfeeding? **/Utekerezako kuboneka kwazo kugira uruhare mu kugabanuka ku mubare w'ababyeyi bonsa mu buryo budasanzwe?**

B2. *Evaluating Interventions*/***Gusuzuma igikorwa***
B2.1 Are you aware of specific policies or programs that have been successful at improving breastfeeding practices? **/Waba hari politiki cyangwa gahunda yihariye uzi yagenze neza mu guteza imbere uburyo bwo konsa?**
If yes: What has made these interventions successful? / **Niba ari yego, ni iki cyatumye iyo gahunda igenda neza?**

B2.2 Please review the relevant policies and programs identified through our desk review (below). Out of those listed, which interventions are you directly involved with? **Gerageza usuzume politiki na gahunda bifitanye isano byagaragajwe binyuze mu isuzuma ryacu(hepfo), muri uru rutonde ni ubuhe buryo wagizemo uruhare?**
Prompt: Please describe your experience working in this intervention. **Gerageza usobanure imikoranire yawe niyi gahunda?**
Prompt: What works the best? What works the least? **Ni iyihe ikora neza cyane? Ni iyihe idakora neza?**
Prompt: What do you consider the biggest challenges? /**Ni iki ufata nk' mbogamizi nyamukuru?**
Prompt: What do you think could be done to improve it? / **Ni iki utekereza ko cyakorwa kugira ngo birusheho kugenda neza?**

B2.3 Are there any other interventions targeting exclusive breastfeeding that you're involved with that are not listed here? **/Haba hari indi gahunda urumo igamije konsa bidasanzwe (konsa ntakindi uvangiye umwana) urimo butavuzwe hano?**
If yes: Please describe your experience working in this intervention. / **Niba ari yego, gerageza usobanure imikoranire yawe niyo gahunda**

Relevant Interventions Identified by Desk Review/ ibikorwa bifitanye isano byasuzumiwe hamwe.
Antenatal and post-natal care visits and counseling on breastfeeding/ **Gahunda yo kwita ku bagore batwite n'abamaze kubyara no kubaha inama zijyanye no konsa.**
ECD breastfeeding and positive parenting program for pregnant women/**Gahunda y'irerero ry'incuke,konsa no kurera neza ku bagore batwite.**
World Breastfeeding Week awareness campaign/**Gahunda y'ubukangurambaga ku cyumweru cya hariwe konsa ku isi.**

 doi:10.20944/preprints202405.0572.v1

C. Overweight and obesity in women of reproductive age/Ibiro byinshi bikabije n'umubyibuho ukabije ku bagore bari mu myaka yo kubyara.

C1. *Assessing the Nutrition Problem/**Gusuzuma Ikibazo cy'imirirre***

C1.1 In your experience, how common is overweight and obesity among women? / **Mu bushishozi bwawe, umubyibuho ukabije n'ibiro byinshi bikabije bikunze kugaragara mu bagore?**

Prompt: Which types of women are most likely to be overweight? / **Ni abahe bagore bakunze kugira umubyibuho ukabije?**

C1.2 In your experience, are overweight women aware that they are overweight? / **Ukurikije uko ubibona, ubona abagore bafite umubyibuho ukabije bamenya ko bafite umubyibuho ukabije?**

Prompt: Are women in the community generally aware of the health risks of being overweight or obese?

/Abagore muri rusange bazi ingaruka k' ubuzima zo kugira umubyibuho ukabije cg Ibiro byinshi bikabije?

C1.3 Have you noticed a difference in overweight prevalence between men and women? / **Waba hari itandukaniro wabonye hagati y'ubwiyongere bw'ibiro bukabije ku abagabo n'ubwiyongere bw' Ibiro bukabije ku bagore? /**

If yes: At what age do you begin to notice this difference? / **Ni kuyihe myaka utangira kubona iryo tandukaniro?**

Prompt: What do you think could be the reasons for this difference? **Utekereza ko ari iki gishobora kuba impamvu yiri tandukaniro?**

C1.4 Do you consider overweight and obesity among women to be a problem? /**Utekerezako Ibiro byinshi bikabije n'umubyibuho ukabije ari Ikibazo ku bagore?**

If yes: What do you think could be the reasons for this problem? / **Utekereza ko ari iki gishobora kuba Impamvu ziki kibazo?**

C2. *Evaluating Interventions/ **Gusuzuma ibikorwa***

C2.1 Are you aware of specific policies or programs that have been successful at targeting overweight and obesity among women? /**Waba uzi politiki cg gahunda yagezweho neza mu kurwanya Ibiro byinshi n'umubyibuho ukabije ku bagore?**

If yes: What has made these interventions successful? / **Niba ari yego, ni iki cyatumye iyo gahunda igerwaho neza?**

C2.2 Please review the relevant policies and programs identified through our desk review (below). Out of those listed, which interventions are you directly involved with? / **Gerageza usuzume politiki na gahunda bifitanye isano byagaragajwe binyuze mu isuzuma ryacu(hepfo), muri uru rutonde ni ubuhe buryo wagizemo uruhare?**

Prompt: Please describe your experience working in this intervention. **Gerageza usobanure imikoranire yawe niyi gahunda?**

Prompt: What works the best? What works the least? **Ni iyihe ikora neza cyane? Ni iyihe idakora neza?**

Prompt: What do you consider the biggest challenges? **Ni iki ufata nk' imbogamizi nyamukuru?**

 doi:10.20944/preprints202405.0572.v1

Prompt: What do you think could be done to improve it? / **Ni iki utekereza ko cyakorwa kugira ngo birusheho kugenda neza?**

C2.3 Are there any other interventions targeting overweight among women that you're involved with that are not listed here? **/Haba hari indi gahunda witabiriye igamije gukumira umubyibuho ukabije itari muzavuzwe hano?**

If yes: Please describe your experience working in this intervention. **/Niba ari yego, gerageza usobanure imikoranire yawe niyo gahunda.**

Relevant Interventions Identified by Desk Review/ Ibikorwa byasuzumiwe hamwe
Maternal and Child Health Week Awareness Campaign/**Gahunda y'icyumweru cyahariwe ubukangurambaga k'ubuzima bw'umwana n'umubyeyi.**
Rwanda Alliance Against Obesity/obesity prevention programs **/ Gahunda y'ihuriro Nyarwanda rigamije gukumira umubyibuho ukabije**

D. Anemia among women and children/ Ikibazo cy'amaraso make ku bana n'abagore D1. *Assessing the Nutrition Problem/* ***Gusuzuma Ikibazo cy'imirire***

D1.1 In your experience, how common is anemia in the population? / **Mu bushishozi bwawe, ubona hari Ikibazo cy amaraso make mu baturage?**

Prompt: Which individuals or groups (e.g. age, gender) are most likely to be anemic? **Ni abahe bantu cg itsinda bakunze kwibasirwa (urugero: imyaka n'igitsina) n'ikibazo cy'amaraso make?**

D1.2 In your experience, are people in the community aware of the health risks of being anemic, especially while pregnant? / **Mu bushishozi bwawe, ubona abaturage bazi ingaruka zo kugira amaraso make cyane cyane ku mugore utwite?**

If yes: Where do most people receive this information? / **Niba ari yego, Nihehe abantu bahabwa ayo makuru?**

D2. *Evaluating Interventions/* ***Gusuzuma ibikorwa***

D2.1 Are you aware of specific policies or programs that have been successful at targeting anemia? / **Waba uzi politiki cg gahunda yagezweho neza mu gukumira Ikibazo cy'amaraso make?**

If yes: What has made these interventions successful? / **Niba ari yego, ni iki cyatumye icyo gikorwa kigerwaho neza**

D2.2 Please review the relevant policies and programs identified through our desk review/ (below)/. Out of those listed, which interventions are you directly involved with? / **Gerageza usuzume politiki na gahunda bifitanye isano byagaragajwe binyuze mu isuzuma ryacu(hepfo), muri uru rutonde, ni ubuhe buryo wagizemo uruhare?**

Prompt: Please describe your experience working in this intervention. / **Gerageza usobanure imikoranire yawe niyi gahunda?**

Prompt: What works the best? What works the least? **Ni iyihe ikora neza cyane? Ni iyihe idakora neza?**

Prompt: What do you consider the biggest challenges? **Ni iyihe mbogamizi nyamukuru uhura nayo?**

Prompt: What do you think could be done to improve it? / **Utekereza ko ariki cyakorwa kugira ngo birusheho kugenda neza?**

 doi:10.20944/preprints202405.0572.v1

D2.3 Are there any other interventions targeting anemia, especially among women and children under 5 years, that you're involved with that are not listed here? / **Haba hari ikindi gikorwa kigamije gukumira Ikibazo cy'amaraso macye cyane cyane ku bagore n'abana bari munsi y'imyaka 5 wakoranye nacyo kitari mu byavuzwe hano?**

If yes: Please describe your experience working in this intervention. / **Niba ari yego, gerageza usobanure imikoranire yawe nicyo gikorwa.**

Relevant Interventions Identified by Desk Review/ibikorwa byasuzumiwe hamwe
Antenatal and post-natal care visits and counseling (supplementation)/**igikorwa cyo kwita, gusura no kugira inama abagore batwite n'ababyaye**
Iron and folic acid supplementation to pregnant women (ANC visits)/ **igikorwa cyo gutanga inyongera y'ubutare (feri) na aside folike ku bagore batwite**
Iron supplementation to children 6-24 months/ **Igikorwa cyo guha inyongera y' ubutare (feri) ku bana bari hagati y'amezi 6-24**
Distribution of fortified blended foods (Shisha Kibondo) to Ubudehe Category 1 and 2 households (pregnant and lactating women, children 6-23 months)/ **Igikorwa cyo gutanga ifu y'igikoma ya Shisha kibondo ku miryango iri mukiciro cya 1 ni cya 2 cy'ubudehe (abagore batwite n'abonsa ,abana bari hagati y'amezi 6 na 23)**
In-home fortification: MNPs, complementary cereals/ **Igikorwa cyo kongera intungamubiri mu mvange y'ibinyampeke.**
Screening of pregnant women for anemia in all health centers/ **Igikorwa cyo kugenzura Ikibazo cy'amaraso macye ku bagore batwite mu bigonderabuzima byose.**

EDUCATION SECTOR INTERVIEW GUIDE/Umuyoboro w'ibazwa ku rwego rw'uburezi

Education Sector Potential Interviewees/**Ababazwa b'ingenzi mu rwego rw'uburezi:**

- School Feeding Program:/**Gahunda yo kugaburira abana ku ishuli**
- Director of Education, Joint Action Development Forum Officer, School Committee Members/ **Umuyobozi ushinzwe uburezi, Umukozi ushinzwe iterambere ry'ihururiro ry'ibikorwa, abanyamuryango b'ishuli**
- One Cup of Milk per Child Program: School Teacher Focal Point, Program Coordinator, Girinka Selection Officer/ **Gahunda y'igikombe cy'amata kuri buri mwana, umwarimu w'ishuri ry'ibanze, umuhuzabikorwa wa gahunda, Umukozi ushinzwe gutoranya abagenerwa girinka.**

D. Anemia among women and children/ Ikibazo cy'amaraso macye ku bagore n'abana D1.

Assessing the Nutrition Problem/ ***Gusuzuma Ikibazo cy' imirire***

D1.1 In your experience, how common is anemia in the population? /**Mu bushishozi bwawe, ubona hari**

ibura ry'amaraso mubaturage?

 doi:10.20944/preprints202405.0572.v1

Prompt: Which individuals or groups (age group) are most likely to be anemic? / **Ni irihe tsinda (imyaka n'itsinda) rikunze kwibasibwa nibura ry'amaraso?**

D1.2 In your experience, are people in the community aware of the health risks of being anemic, especially while pregnant? / **Mu bushishozi bwawe, ubona abantu bazi ingaruka zo kugira amaraso macye cyane cyane mu gihe cyo gutwita?**
If yes: Where do most people receive this information? /**Niba ari yego, nihehe abantu bahabwa ayo makuru?**

D2. *Evaluating Interventions*/ ***Gusuzuma ibikorwa***
D2.1 Are you aware of specific school-related policies or programs that have been successful at targeting anemia in children? /**Waba uzi politiki cg gahunda yihariye yagezweho neza mu gukumira Ikibazo cy'amaraso macye mu bana**?
If yes: What has made these interventions successful? / **Niba ari yego niki cyatumye icyo gikorwa kigerwaho neza?**

D2.2 Please review the relevant policies and programs identified through our desk review (below). Out of those listed, which interventions are you directly involved with? **Gerageza usuzume politiki na gahunda bifitanye isano byagaragajwe binyuze mu isuzuma ryacu(hepfo), muri uru rutonde, ni ubuhe buryo wagizemo uruhare?**
Prompt: Please describe your experience working in this intervention / **Gerageza usobanure imikoranire yawe niyo gahunda.**
Prompt: What works the best? What works the least? **Ni iyihe gahunda ikora neza cyane? ni iyihe gahunda idakora neza?**
Prompt: What do you consider the biggest challenges? / **Niki ubona nk' imbongamizi nyamukuru?**
Prompt: What do you think could be done to improve it? / **Utekereza ko ari iki cyakorwa ngo birusheho kugenda neza?**

D2.3 Are there any other school-focused interventions targeting anemia in children that you're involved with that are not listed here? /**Haba hari kindi gikorwa cyibanda ku mashuri cyo gukumurira Ikibazo cy'amaraso macye mu bana mwakoranye kitari mu byavuzwe hano?**
If yes: Please describe your experience working in this intervention. / **Niba ari yego, gerageza usobanure imikoranire yanyu nicyo gikorwa**

Relevant Interventions Identified by Desk Review /Ibikorwa byasuzumiwe hamwe
Weekly campaign about Fe + FA to target anemia in girls in secondary schools/ **Icyumweru cyahariwe ubukangurambaga ku butare (feri) na aside folike mu gukumira Ikibazo cy' amaraso macye ku bana ba bakobwa mu mashuli yisumbuye.**

E. Dietary intake /Imirire

E1. *Assessing the Nutrition Problem*/ ***Gusuzuma Ikibazo cy'imirire.***
E1.1 In your opinion, how do you think most community members define a healthy diet? /**Uko ubibona, utekereza ko abaturage benshi basobanura bate indyo yuzuye?**

 doi:10.20944/preprints202405.0572.v1

Prompt: Which food groups are considered healthy or unhealthy? / **Ni irihe tsinda ry'ibibiribwa rifatwa nk'indyo yuzuye cg indyo ituzuye?**
Prompt: Where do you think most people get their information about healthy diets? / **Utekereza ko ari he abantu benshi bakura amakuru yerekeranye n'indyo yuzuye**?
Prompt: Do you notice a difference in perceptions between children and their parents? / H**ari itandukaniro ubona mu bitekerezo hagati y'abana n'ababyeyi babo?**

E1.2 What do you think the biggest dietary gaps are among children in the community? /**Utekerezako icyuho kinini mu mirere mu baturage kiri mu bana?** /
Prompt: Which foods or food groups are the least consumed or lacking in the diet? / **Ni ibihe biribwa cg itsinda ry'ibiribwa biribwa gacye cg bitaboneka mu ndyo?**
Prompt: Are any foods or food groups consumed in excess? / **Haba hari ibiribwa cg itsinda ry'ibiribwa biribwa ku kigero gikabije?**
E1.3 Which individuals or groups (e.g. age) do you think most often do not receive an adequate diet (sufficient quantity and/or diversity of foods) at home? / **Ni abahe bantu cg amatsinda (urugero; imyaka) utekerezako badakunze kubona indyo ihagije (ingano ihagije n'ubwoko butandukanya bw'ibiribwa)**
*Prompt***:** Why do you think these groups in particular do not receive an adequate diet? / **Utekerezako ari kubera iki ayo matsinda by'umwihariko atabona indyo ihagije?**

E2. *Evaluating Interventions/* ***Gusuzuma ibikorwa***
E2.1 Are you aware of specific school-related policies or programs that have been successful at improving diets and dietary habits in children? / **Waba uzi politiki cg gahunda yihariye mu mashuli yagezweho neza mu gutezimbere indyo n'imirire ku bana?**
If yes: What has made these interventions successful? / **Niki cyatumye ibyo bikorwa bigenda neza?**

E2.2 Please review the relevant policies and programs identified through our desk review (below). Out of those listed, which interventions are you directly involved with? / **Gerageza usuzume politiki na gahunda bifitanye isano byagaragajwe binyuze mu isuzuma ryacu(hepfo), muri uru rutonde ni ubuhe buryo wagizemo uruhare?**
Prompt: Please describe your experience working in this intervention. / **Gerageza usobanure imikoranire yawe niyi gahunda**
Prompt: What works the best? What works the least? / **Ni iyihe ikora neza? Ni iyihe ikora gake?**
Prompt: What do you consider the biggest challenges? / **Niki ufata nk'inkombogamizi nyamukuru?**
Prompt: What do you think could be done to improve it? / **Utekerezako ari iki cyakorwa ngo bigende neza kurushaho?**

E2.3 Are there any other school-focused interventions targeting diets or dietary habits in children that you're involved with that are not listed here? **/ Hari indi gahunda yibanda ku mashuli mukwita ku biribwa n'imirire mu bana itavuzwe hano ugiramo uruhare?**
If yes: Please describe your experience working in this intervention. / **Niba ari yego, gerageza usobanure imirikoranire yawe niyi gahunda.**

Relevant Interventions Identified by Desk Review/ Ibikorwa Byasuzumiwe hamwe

 doi:10.20944/preprints202405.0572.v1

School feeding program/ **Gahunda yo kugabura ku mashuli**
One Cup of Milk per Child program / **Igikombe cy'amata kuri buri mwana**.
School menu development to ensure nutritious meals for different age groups /**Gutegura urutonde rw'ibiribwa ku ishuli** **mu rwego rwo kunoza indyo yuzuye mu matsinda y'imyaka itandukanye**
School gardens and farming educational programs / **Gahunda y'ishuli y'karima k'igikoni no kwigisha ubuhinzi.**
School garden production used for school feeding / **Gukoresha akarima k'igikoni mu kugabura ku ishuli**
School feeding linked to local procurement (locally produced food) **/ Gahunda yo kugabura ku ishuli ihuzwa** **n' amasoko ya hafi (ibiribwa bihingwa hafi)**
Food and nutrition education expanded in curriculum and extracurriculars / **Inyigisho zidasanzwe zagutse ku biribwa** **n'imirire**
Parent involvement in school feeding and gardening programs / **Uruhare rw'ababyeyi muri gahunda yo kugabura no** **gutunganya akarima k'igikoni ku ishuli.**
Vitamin A supplementation to children under 5 in preschools / **Inyongera ya vitamin A ihabwa abana bari munsi**

y'imyaka 5 bo mu kiburamwaka
Inkongoro y'Umwana (children from poor households receive free milk at school / **abana bavuka mu miryango itishoboye** **bahabwa amata nta kiguzi ku ishuli) /**

SOCIAL PROTECTION SECTOR INTERVIEW GUIDE / Umuyobora w'ibazwa ku rwego rurengera imiyoborere

Social Protection Sector Potential Interviewees: **Ababazwa bingenzi mu rwego rurerengera imiyoborere.**

- Nutrition Sensitive Direct Support Program (NSDS) members / **Abagize gahunda yo gufasha abagirwaho ingaruka n'imirire**
- Shisha Kibondo ECD District Focal Point/ **Abahagarariye amarerero y'incuke mu turere**.
- National Women's Council, Executive Committee at District level/**Abagize komite nyobozi y'urwego rw'igihugu rw'abagore mu Karere.**
- Faith-based community volunteers in Rubavu and Rusizi / **Abakorerabushake bashingiye ku kwemera muri Rubavu na Rusizi**
- SUN Civil Society Alliance members in Rubavu and Rusizi / **Abagize ihuriro rya SUN CIVIL SOCIETY muri Rubavu na Rusizi**

A. Stunting and wasting (undernutrition) in children under 5 /Igwingira n'imirire mibi ku bana bari munsi y'imyaka 5

A1. *Assessing the Nutrition Problem/* ***Gusuzuma Ikibazo cy'imirire***

 doi:10.20944/preprints202405.0572.v1

A1.1 In your experience, how common is stunting and/or wasting in children under 5? /**Mu bushishozi bwawe, hari igwingira n'imirire mibi mu bana bari munsi y'imyaka 5?**
If yes: Which children do you think are most affected? What do you think are the biggest contributing factors?
/ Niba ari yego, ni abahe bana bigiraho ingaruka cyane? Utekereza ko ari iyihe mpamvu nyamukuru ibitera?
If no: Please explain your view. Recent improvements or intervention successes? / **Niba ari oya, Gerageza usobanure uko ubibona. ibikorwa biheruka kugerwaho?**

A1.2 Have you seen recent improvement or worsening of these conditions? **Waba hari impinduka nziza uheruka kubona cg igutuma biba bibi kurushaho?**
If yes: What do you think were the drivers of this change? **Niba ari yego, utekerezako ari ki gitera izi mpinduka? /**

A2. *Evaluating Interventions*/***Gusuzuma ibikorwa***
A2.1 Are you aware of specific policies or programs that have been successful at targeting stunting and wasting (undernutrition) in children under 5? **Waba uzi politiki cg gahunda yagezweho mugukumira igwingira n'imirire mibi ku bana bari munsi y'imyaka 5? /**
If yes: What has made these interventions successful? Niba ari yego, ni iki cyatumye izo gahunda zigwerwaho neza?

A2.2 Please review the relevant policies and programs identified through our desk review (below). Out of those listed, which interventions are you directly involved with? **Gerageza usuzume politiki na gahunda bifitanye isano byagaragajwe binyuze mu isuzuma ryacu(hepfo), muri uru rutonde ni ubuhe buryo wagizemo uruhare?**
Prompt: Please describe your experience working in this intervention. **Gerageza usobanure imikoranire yawe niyi gahunda**
Prompt: What works the best? What works the least? **Ni iyihe gahunda ikora neza cyane? ni iyihe gahunda idakora neza?**
Prompt: What do you consider the biggest challenges? **Niki ubona nk'inkombogamizi ikomeye?**
Prompt: What do you think could be done to improve it? **Utekerezako ari iki cyakorwa ngo bigende neza kurushaho?**

A2.3 Are there any other interventions targeting undernutrition in children under 5 that you're involved with that are not listed here? / **Haba indi gahunda igamije gukumira imirire mibi mu bana bari munsi y'imyaka 5 wagizemo urahare itari muzo twavuze hano?**
If yes: Please describe your experience working in this intervention. / **Niba ari yego, gerageza usobanure imikoranire yawe niyi gahunda.**

Relevant Interventions Identified by Desk Review/ Ibikorwa byasuzumiwe hamwe
Co-responsibility cash transfers during first 1000 days to Ubudehe 1 and 2 / **Gufatanya kohereza amafaranga mu** **minsi 1000 ya mbere mu cyiciro 1 ni cya 2 cy'ubudehe**

 doi:10.20944/preprints202405.0572.v1

Distribution of fortified blended foods (Shisha Kibondo) to Ubudehe Category 1 and 2 households / **Gutanga imvange y'igikoma (shisha kibondo) ku miryango iri mu kiciro cya 1 ni cya 2 cy'ubudehe**.
Food assistance through community kitchen garden programs / **Inyunganizi ku biribwa bunyuze muri gahunda y'akarima k'igikoni mu baturage.**
Small livestock and seed distribution programs for Ubudehe 1 and 2 / **Gahunda yo gutanga imbuto n'ubworozi bw'amatungo bucirirtse ku bari mu kiciro cya 1 ni cya 2 cy'ubudehe**

C. Overweight and obesity among women of reproductive age / Ibiro byinshi bikabije n'umubyibuho ukabije ku bagore bari mu myaka yo kubyara.

C1. *Assessing the Nutrition Problem/* ***Gusuzuma Ikibazo cy'imirire***

C1.1 In your experience, how common is overweight and obesity among women? / **Mu bushishozi bwawe, ubona umubyibuho ukabije ukunze kugaragara mu bagore?**

Prompt: Which types of women are most likely to be overweight? / **Ni abahe bagore bakunze kugira umubyibuho ukabije?**

C1.2 In your experience, are overweight women aware that they are overweight? / **Mu bushishozi bwawe ubona abagore bafite umubyibuho ukabije babimenya ko bafite umubyibuho ukabije?**

Prompt: Are women in the community generally aware of the health risks of being overweight or obese?

/Muri rusange mu baturage abagore bazi ingaruka zo kugira umubyibuho ukabije?

C1.3 Have you noticed a difference in overweight prevalence between men and women**? /Waba warigeze ubona itandukaniro mukwiyongera k'umubyibuho ukabije hagati y'abagore n'abagabo?**

If yes: At what age do you begin to notice this difference? / **Niba ari yego, Ni kuyihe myaka utangira kubona iryo tandukaniro?**

Prompt: What do you think could be the reasons for this difference? / **Utekereza ko ari izihe mpamvu zitera iryo tandukniro?**

C1.4 Do you consider overweight and obesity among women to be a problem? / **Utekereza ko umubyibuho ukabije mu bagore ari ikibazo?**

If yes: What do you think could be the reasons for this problem? / **Utekereza ko ari izihe mpamvu zitera iki kibazo?**

C2. *Evaluating Interventions/* ***Gusuma ibikorwa***

C2.1 Are you aware of specific policies or programs that have been successful at targeting overweight and obesity among women? / **Waba uzi politiki cg gahunda yagezweho mu guhangana n'umubyibuho ukabije ku bagore?**

If yes: What has made these interventions successful**? / Niba ari yego, utekereza ko ari ki cyatumye bigerwaho?**

 doi:10.20944/preprints202405.0572.v1

C2.2 Please review the relevant policies and programs identified through our desk review (below). Out of those listed, which interventions are you directly involved with? / **Gerageza usuzume politiki na gahunda bifitanye isano byagaragajwe binyuze mu isuzuma ryacu(hepfo), muri uru rutonde ni ubuhe buryo wagizemo uruhare?**

Prompt: Please describe your experience working in this intervention. **Gerageza usobanure imikoranire yawe niyi gahunda**

Prompt: What works the best? What works the least? **Ni iyihe gahunda ikora neza cyane? ni iyihe gahunda idakora neza?**

Prompt: What do you consider the biggest challenges? **Niki ubona nk'inkombogamizi ikomeye?**

Prompt: What do you think could be done to improve it? **Utekerezako ari iki cyakorwa ngo bigende neza kurushaho?**

C2.3 Are there any other interventions targeting overweight among women that you're involved with that are not listed here? **/ Haba hari indi gahund igamije gukumira umubyibuho ukabije ku bagore wagizemo uruhare ikaba itari muzavuzwe hano?**

If yes: Please describe your experience working in this intervention. **Gerageza usobanure imikoranire yawe niyi gahunda**

Relevant Interventions Identified by Desk Review/ Ibikorwa byasuzumiwe hamwe
Regulations and taxes on products high in trans-fat and sodium, sugary beverages, and processed food /**Amabwiriza n'imisoro ku biribwa bifite ibinure byinshi, sodiyumu, ibyo kunywa birimo isukari n'ibiribwa bitunganijwe mu nganda.**
Rwanda Alliance Against Obesity/obesity prevention programs / **Gahunda y'ihuriro Nyarwanda rigamije gukumira umubyibuho ukabije.**
User-friendly labeling and translated international food labels/ **Abakoresha ibirango bya gishuti n'ibirango mpuzamahanga by'ibiribwa byahinduwe**
Educational and behavior change campaigns on physical activity / **ubukangurambaga ku guhingura imyigire n'imyitwarire ku bikorwa ngororamubiri.**

AGRICULTURE SECTOR INTERVIEW GUIDE/ Umuyoboro w'ibazwa mu rwego rw'ubuhnzi

Social Protection Sector Potential Interviewees:/ **Ababazwa bingenzi mu rwego rushinzwe imiyoborere.**

- One Acre Fund/Tubura Field Coordinators and Officers in Rubavu and Rusizi/ **Abahuzabikorwa n' abakozi ba Tubura muri Rusizi na Rubavu**
- Farmer Field Schools (FFS and Livestock FFS Facilitators in Rubavu and Rusizi/

  Abafashamyumvire mu ishuli ry'abahinzi n'aborozi muri Rubavu na Rusizi
- Girinka Program Focal Point, program coordinator/**Umuhuzabikorwa wa gahunda ya Gira inka**
- School Gardening: School Committee members, Program coordinator / **Umuhuzabikorwa wa gahunda y'akarima k'igikoni ku ishuli n'abagize komite y'ishuli**
- World Vision Rwanda members/ **Abagize world vision yo mu Rwanda**

 doi:10.20944/preprints202405.0572.v1

A. Stunting and wasting (undernutrition) in children under 5 years / Igwingira n'imirire mibi mu bana bari munsi y'imyaka 5

A1. *Assessing the Nutrition Problem* / ***Gusuzuma Ikibazo cy'imirire***

A1.1 In your experience, how common is stunting and/or wasting in children under 5? / **Mu bushishozi bwawe, ubona igwingira n'imirire mibi bikunze kubaho ku bana bari munsi y'imyaka 5?**

If yes: Which children do you think are most affected? What do you think are the biggest contributing factors?

/ Niba ari yego, ni abahe bana bikunze kugiraho ingaruka? Utekerezako biterwa niki?

If no: Please explain your view. Recent improvements or intervention successes? **Niba ari oya, gerageza usobanure uko ubibona, haba hari igikorwa giheruka kugerwaho**

A1.2 Have you seen recent improvement or worsening of these conditions? / **Waba hari impinduka nziza uheruka kubona cg igutuma biba bibi kurushaho?**

If yes: What do you think were the drivers of this change? **Niba ari yego, utekerezako ari ki gitera izi mpinduka? /**

A2. *Evaluating Interventions* / ***Gusuzuma ibikorwa***

A2.1 Are you aware of specific agriculture-related policies or programs that have been successful at targeting stunting and wasting (undernutrition) in children under 5? **Waba uzi politiki cg gahunda yihariye mu buhinzi yagezweho mu gukumira igwingira n'imirire mibi ku bana bari munsi y'imyaka 5?**

If yes: What has made these interventions successful? **Niba ari yego, niki cyatumye iyo gahunda igerwaho neza?**

A2.2 Please review the relevant agricultural policies and programs identified through our desk review (below). Out of those listed, which are you directly involved with? / **Gerageza usuzume politiki na gahunda z'ubuhinzi bifitanye isano byagaragajwe binyuze mu isuzuma ryacu(hepfo), muri uru rutonde ni ubuhe buryo wagizemo uruhare**

Prompt: Please describe your experience working in this intervention. **Gerageza usobanure imikoranire yawe niyi gahunda**

Prompt: What works the best? What works the least? **Ni iyihe gahunda ikora neza cyane? ni iyihe gahunda idakora neza?**

Prompt: What do you consider the biggest challenges? **Niki ubona nk'inkombogamizi ikomeye?**

Prompt: What do you think could be done to improve it? **Utekerezako ari iki cyakorwa ngo bigende neza kurushaho?**

A2.3 Are there any other agriculture-related interventions targeting undernutrition in children under 5 that you're involved with that are not listed here? / **Haba hari indi gahunda yerekeranye n'ubuhinzi igamije gukumira imirire mibi ku bana bari munsi y'imyaka 5 wagizemo uruhare ikaba itavuzwe hano?**

If yes: Please describe your experience working in this intervention / **Gerageza usobanure imikoranire yawe niyi gahunda**

 doi:10.20944/preprints202405.0572.v1

Relevant Interventions Identified by Desk Review Ibikorwa byasuzumiwe hamwe /
Promote research on biofortified crops and diversified animal products/ **Guteza imbere ubushakashatsi ku bihingwa bikomoka ku binyabuzima n'ibikomoka ku matungo atandukanye**
Girinka program (One cow per poor family) /**Gahunda ya Girinka (inka imwe kuri buri muryango ukennye)**

E. Dietary intake / Imirire

E1. *Assessing the Nutrition Problem* / ***Gusuzuma Ikibazo cy'imiririre***

E1.1 In your opinion, how do you think most community members define a healthy diet? / **Ku bwawe, utekereza ko abaturage benshi basobanura bate indyo yuzuye**?

Prompt: Which food groups are considered healthy or unhealthy? / **Ni ayahe matsinda y' ibiribwa afatwa nkatanga ubuzima bwiza n'adatanga ubuzima bwiza?**

Prompt: Where do you think most people get their information about healthy diets? / **Utekereza ko abantu benshi bakura he amakuru ajyanye n'imirire myiza?**

E1.2 What do you think the biggest dietary gaps are in the community? **Niki utekereza ko ari icyuho kinini mu mirire mu baturage?**

Prompt: Which foods or food groups are the least consumed or lacking in the diet? **Ni ibihe biribwa cg itsinda ry'ibiribwa biribwa gake cg bitaboneka mu ndyo?**

Prompt: Are any foods or food groups consumed in excess? / **Haba hari ibiribwa cg itsinda ry' ibiribwa biribwa ku kigero gikabije?**

E1.3 Which individuals or groups (e.g. age) do you think most often do not receive an adequate diet (sufficient quantity and/or diversity of foods)? / **Ni bahe bantu cg amatsinda (urugero: imyaka) utekereza ko badakunze kubona indyo ihagije (ingano ihagije, cg ubwoko butandukanya bw'ibiribwa)**

*Prompt***:** Why do you think these groups in particular do not receive an adequate diet? **Utekereza ko ari ukubera iki ayo matsinda atabona ibiribwa bihagije?**

E1.4 In your opinion, among farming households, which crops are most often produced? / **Ku bwawe, mu ngo z'abahinzi, ni ibihe bihingwa bikunze guhingwa?**

Prompt: Which crops are then mostly sold to the market and why? / **Ni ibihe bihingwa bikunze kugurishwa ku isoko, kubera iki?**

Prompt: Which crops are then mostly kept for at-home consumption and why? / **Ni ibihe bihingwa bijyanwa cyane kuribwa mu rugo, kubera iki?**

E2. *Evaluating Interventions/* ***Gusuzuma ibikorwa***

E2.1 Are you aware of specific agriculture-related policies or programs that have been successful at improving diets and dietary habits in the community? / **Waba uzi politiki cg gahunda ijyanye n'ubuhinzi yagenze neza mu guteza imbere indyo n'imirire mu baturage?**

If yes: What has made these interventions successful? **Niba ari yego, niki cyatumye izo gahunda zigerwaho neza?**

 doi:10.20944/preprints202405.0572.v1

E2.2 Please review the relevant policies and programs identified through our desk review (below). Out of those listed, which interventions are you directly involved with? **Gerageza usuzume politiki na gahunda bifitanye isano byagaragajwe binyuze mu isuzuma ryacu(hepfo), muri uru rutonde ni ubuhe buryo wagizemo uruhare?**

Prompt: Please describe your experience working in this intervention. **Gerageza usobanure imikoranire yawe niyi gahunda**

Prompt: What works the best? What works the least? **Ni iyihe gahunda ikora neza cyane? ni iyihe gahunda idakora neza?**

Prompt: What do you consider the biggest challenges? **Niki ubona nk'inkombogamizi ikomeye?**

Prompt: What do you think could be done to improve it? **Utekerezako ari iki cyakorwa ngo bigende neza kurushaho?**

E2.3 Are there any other agriculture-focused interventions targeting diets or dietary habits that you're involved with that are not listed here? **Haba hari ibindi bikorwa by'ubuhinzi byibanda ku ndyo n'imirire wagizemo uruhare bitari mubyavuzwe hano?**

If yes: Please describe your experience working in this intervention/ **Niba ari yego, gerageza usobanura imikoranire yawe n'ibi bikorwa.**

Relevant Interventions Identified by Desk Review/ Ibikorwa byasuzumiwe hamwes
Technical assistance for fruit trees and kitchen/homestead gardens in vulnerable households/ **Ubufasha muri tekiniki y'ibiti by'imbuto, akarima k'igikoni mu ngo zitishoboye.**
Girinka program (One cow per family)/ **Gahunda ya girinka (inka imwe kuri buri muryango)**
Vulnerable households supported to produce animal-source foods for own consumption through extension services/ **Ingo zitishoboye zifashwa gukora ibiryo bikomoka ku matungo binyuze muri serivisi zagutse**
Food fortification programs scale-up (iron-rich beans, maize, orange sweet potatoes) including extension and input support / **Gahunda yo kongera intungamubiri mu biribwa (ibishyimbo bikungahaye ku butare (feri), ibigoli, ibijumba bya karot**
Village nurseries for fruit agroforestry trees / **Ubuhumbikiro(pipiniyeri) bw'umudugudu bw'imbuto ziribwa n' izi biti bivangwa n'imyaka.**
School feeding linked to local procurement (locally produced food) / **Kugabura ku ishuli bihuzwa n'amasoko ya bugufi (ibiribwa bihingwa iwacu)**
Promoted growth of nutrient-dense crops (improved seeds, trainings) / **Gutezimbere gukura kw'ibihingwa bifite intungamubiri nyinshi (imbuto zivuguruye, amahugurwa)**
Targeted support to women for income-generating on- and off-farm activities / **Inkunga igenewe abagore mu kongera inyungu iva mu bikorwa by'ubuhinzi no mu bikorwa byo hanze y'ubuhinzi**
Chicken and/or pig transfer program for vulnerable households / **Gahunda yo gutanga inkoko cg ingurube ku ngo zikennye.**
Transfer programs of other small stock (goats, rabbits) / **Gahunda yo gutanga andi matungo magufi (ihene,inkwavu)**

 doi:10.20944/preprints202405.0572.v1

Behavior change campaigns to encourage vegetable gardens and fruit trees / **Ubukangurambaga mu guhindura imyitwarire no gushishikariza kugira akarima k'imboga n'ibiti by'imbuto**.
Farmer Field Schools, Livestock Farmer Field Schools / **Ishuli ry'abahinzi, ishuli ry'abahinzi borzoi**

SUPPLEMENTARY MATERIAL/ Ibikoresho by'inyongera

Literature Review Summary (available to provide context)/ ***Ubuvanganzo bugaragaza ingingo z'incamake***

Stunting/ igwingira	
33.1% of children under 5 years in Rwanda are stunted **/ 33.1% by'abana bari munsi y'imyaka 5 mu Rwanda baragwingiye**	DHS/ ubushakashatsi Ku mibare n'ubuzima
In Rusizi and Rubavu stunting rates are 28.6% and 49.4% respectively/ **Muri Rusizi na Rubavu ikigero cy'igwingira kiri kuri 28.6% na 49.4%**	2021 NICE Baseline Survey/Ubushakashatsibw'ibanze bwa NICE 2021
Stunting is higher in rural areas and in food insecure households / **Igwingira rigaragara cyane mu bice by'icyaro no mungo zidafite ibyo kurya bihagije**.	DHS/ ubushakashatsi Ku mibare n'ubuzima
Stunting decreases with mother's education level and household wealth / **Igwingira rigabanukana n'ikigero cy'ubumenyi bw'ababyeyi ndetse n'ubukungu bw'urugo**.	DHS/ ubushakashatsi Ku mibare n'ubuzima
Leading hypothesis is stunting is linked to undernutrition in the first 1000 days of life / **Ibyavuye mu bushakashatsi bihuza igwingira n'imirire mibi mu minsi 1000 ya mbere y'ubuzima.**	UNICEF/ Umuryango W'abibumbye wita ku bana
Wasting/ Imirire mibi	
1.1% of children under 5 years in Rwanda are wasted / **1.1% by'abana bari munsi y'imyaka 5 mu Rwanda bafite imirire mibi**	DHS/ ubushakashatsi Ku mibare n'ubuzima /
In Rusizi and Rubavu wasting rates are 2.1% and 2.8 % respectively/ **Muri Rusizi na Rubavu ikigero cy'imiririre mibi ni 2.1% na 2.8%**	2021 NICE Baseline Survey / Ubushakashatsi bw'ibanze bwa NICE 2021
Wasting is higher in children with underweight mothers and highest in children 6-8 months / **Imirire mibi yiganje cyane mu bana bafite ababyeyi bafite umubyibuho ukabije ndetse no mu bana bari hagati y'amezi 6 - 8**	DHS/ ubushakashatsi Ku mibare n'ubuzima

 doi:10.20944/preprints202405.0572.v1

Leading hypothesis is wasting is linked to premature end of exclusive breastfeeding/ **Ubushakashatsi buhuza imiriririre mibi no guhagarika konsa bidasanzwe imburagihe.**	UNICEF/ Umuryango W'abibumbye wita ku bana
Exclusive breastfeeding/ Konsa umwana ntakindi ahabwa.	
90.5% of women in Rwanda practice exclusive breastfeeding until 6 months / **90.5% by'abagore mu Rwanda bonsa abana ntakindi babaha kugeza ku mezi 6**	CFSVA / Isesengura Ryuzuye mu kwihaza mu biribwa
Exclusive breastfeeding until 6 months is lower in urban areas (86.7%) than in rural areas (91%)/ **Konsa ntakindi uha umwana kugeza ku mezi 6, biri hasi mu bice by'imijyi (86-7%) ugereranije n'ibice by'icyaro (91%)**	CFSVA/ Isesengura Ryuzuye mu kwihaza mu biribwa
Exclusive breastfeeding until 6 months is much lower in Rusizi (50%) and Rubavu (62.6%)	2021 NICE Baseline

than the national average / **Konsa mu gihe cya mezi 6 ntakindi umwana ahawe biri hasi muri Rusizi (50%) no muri Rubavu (62.2%) kurusha ikigereranyo cy'igihugu.**	Survey/ Ubushakashatsi bw'ibanze bwa NICE 2021
Overweight and obesity in women of reproductive age / Ibiro byinshi bikabije n'Umubyibuho ukabije ku bagore bari mu myaka yo kubyara	
26.3% of women 15-49 years in Rwanda are overweight and 5.8% are obese / **26.3 ku 100 by'abagore bari hagati y'imyaka 15 na 49 mu Rwanda bafite Ibiro byinshi bikabije na 5.8 ku 100 bafite umubyibuho ukabije.**	DHS/ ubushakashatsi Ku mibare n'ubuzima
Overweight in women 15-49 years in Rusizi is 32.9% and obesity is 7.9% / **Ibiro byinshi bikabije ku bagore bari hagati y' imyaka 15 na 49 bo muri Rusizi biri ku kigero cya 32.9 ku 100 nqho ubyibuho ukabije ukaba kuri 7.9 ku 100.**	2021 NICE Baseline survey Ubushakashatsi bw'ibanze bwa NICE 2021
Overweight in women 15-49 years in Rubavu is 36.4% and obesity is 7.9% / **Ibiro byinshi bikabije ku bagore bari hagati y' imyaka 15 na 49 bo muri Rubavu biri ku kigero cya 36.4ku 100 nqho ubyibuho ukabije ukaba kuri 7.9 ku 100.**	2021 NICE Baseline survey Ubushakashatsi bw'ibanze bwa NICE 2021
Prevalence of overweight and obesity in Rwandan women increases with age / **Umubare wa bagore babaNyarwanda bafite ibiro byinshi bikabije n'umubyibuho ukabije wiyongerana n'imyaka y'ubukure**.	DHS/ ubushakashatsi Ku mibare n'ubuzima

 doi:10.20944/preprints202405.0572.v1

Overweight (42.2%) and obesity (22.3%) is higher among urban women compared to rural women (14% and 3.7% respectively) in Rwanda / **Mu Rwanda, ibiro byinshi bikabije (42.3%) n'umubyibuho ukabije (22.3%) biri hejuru ku bagore bo mu mujyi ugereranije n'abagore bo mu cyaro (14% na 3.7%)**	DHS/ ubushakashatsi Ku mibare n'ubuzima
Overweight and obesity in Rwandan women increases by education level **/ Ibiro byinshi Bikabije n'umubyibuho ukabije ku bagore baba Nyarwanda byiyongera uko ubumenyi Uko ikigero cy'ubumenyi cyiyongera**	DHS ubushakashatsi Ku mibare n'ubuzima /
Overweight and obesity in Rwandan women increases with household wealth / **Ibiro byinshi bikabije n'umubyiho ukabije ku bagore baba Nyarwanda byiyongera uko ubukungu bw'urugo bwiyongera**	DHS ubushakashatsi Ku mibare n'ubuzima /
Anemia in women and children under 5/ Ikibazo cy'amaraso make ku bagore n'abana bari munsi y'imyaka 5	
13% of women 15-49 years and 37% of children under 5 in Rwanda are anemic / **13 ku 100 by'abagore bari hagati y'imyaka 15 ba 49 mu Rwanda na 37 ku 100 by'abana bari munsi y'imyaka 5 bafite Ikibazo cy' amaraso macye.**	DHS ubushakashatsi Ku mibare n'ubuzima /
Anemia is highest among children 6-8 months (70.1%) and decreases with age / **Ikibazo cy'amaraso macye kiri hejuru mu bana bafite hagatiy'amazi 6-8(70-1 ku 100) kandi kigabanuka uko imyaka igabanuka**.	DHS ubushakashatsi Ku mibare n'ubuzima
Anemia is highest among women who are pregnant (24.5%) / **Ikibazo cy' amaraso macye kiri hejuru cyane ku bagore batwite (24.5 ku 100)**	DHS ubushakashatsi Ku mibare n'ubuzima /

 doi:10.20944/preprints202405.0572.v1

Leading hypothesis is that anemia is linked to low maternal iron status and poor complementary feeding practices / **Ubushakashatsi bugaragaza ko kugira amaraso macye bifitanye i cy'ubutare (feri)kiri hasi ku babyeyi ndetse n'imirire ikennye.**	DHS ubushakashatsi Ku mibare n'ubuzima /
Dietary Intake / Imirire	
Less than 50% of children in Rwanda under 1 year are fed the minimum acceptable diet (MAD) for their age / **Hasi ya 50 ku 100 y'abana bari munsi y'umwaka 1 mu Rwanda bagaburirwa indyo yuzuye yemewe ku myaka yabo**	DHS ubushakashatsi Ku mibare n'ubuzima /
Children under 1 year in Rwanda living in rural areas are less likely to receive minimum acceptable diet (MAD) Than children in urban areas /**Abana bari munsi y'umwaka umwe mu Rwanda batuye mu nce z'icyaro ntibakunze kugaburirwa indyo yuzuye yemewe ugereranije n'abana batuye mu nce z'imijyi.**	DHS/ ubushakashatsi Ku mibare n'ubuzima
Children 6-8 months in Rwanda are the least likely to be fed adequate complementary foods / **Abana bari hagati y'amezi 6,8 mu Rwanda nibo badakunze kugaburirwa indyo yuzuzanya ihagije.**	CFSVA/ Isesengura Ryuzuye mu kwihaza mu biribwa
Proportion of children under 1 year in Rwanda fed MAD increases with mother's education /**Umubare w'abana bari munsi y'umwaka 1mu Rwanda bagaburirwa indyo yuzuye wiyongera uko ubumenyi bw'ababyeyi bwiyongera.**	DHS ubushakashatsi Ku mibare n'ubuzima /
Proportion of children under 1 year in Rwanda fed MAD increases with household wealth / **Umubare w'abana bari munsi y'umwaka 1mu Rwanda bagaburirwa indyo yuzuye wiyongera uko ubukungu bw'urugo bwiyongera.**	DHS ubushakashatsi Ku mibare n'ubuzima /
32% of Rwandan women 15-49 years meet minimum dietary diversity (MDD-W) / **32 ku 100 by'abagore baba Nyarwanda bari hagati y'imyaka 15 na 49 bafite imirire iboneye ntarengwa** .	CFSVA/ Isesengura Ryuzuye mu kwihaza mu biribwa
54% of Rwandan women 15-49 years in urban areas meet MDD-W compared to 28% in rural areas / **54 ku 100 by'abagore baba Nyarwanda bari hagati y'imyaka 15 na 49 batuye mu mujyi bafite imirire iboneye ntarengwa ugereranije na 28 ku 100 bo mu cyaro**	CFSVA/ Isesengura Ryuzuye mu kwihaza mu biribwa
Proportion of women meeting MDD-W in Rusizi is 39.3% and 26.7% in Rubavu / **Imibare y'abagore bafite imirere iboneye ntarengwa muri Rusizi ni 39.3 ku 100 na 26.7 ku 100 i Rubavu**	2021 NICE Baseline survey Ubushakashatsi bw'ibanze bwa

 doi:10.20944/preprints202405.0572.v1

	NICE 2021
Women in Rwanda have low consumption of vitamin A rich food, meat, milk, eggs, and fruit /**Abagore bo mu Rwanda bafungura ku kigero cyo hasi ibiribwa bikungahaye kuri vitamin A, inyama, amata, amagi n'imbuto**	CFSVA/ Isesengura Ryuzuye mu kwihaza mu biribwa
Children in Rwanda have low consumption of eggs, flesh food, and dairy products / **Abana bo mu Rwanda bafungura ku kigero cyo hasi amagi, ibiryo byiza, n'ibikomoka ku mata**	CFSVA/ Isesengura Ryuzuye mu kwihaza mu biribwa

Appendix C. DDA program descriptions

Detailed descriptions of these programs are provided in Appendix C.

Program	Description
1. Antenatal care (ANC) visits	Women are encouraged to attend eight ANC visits from the moment they know they are pregnant. At these visits they receive health screenings, vitamin supplements (iron and folic acid) and nutrition counselling.
2. Awareness campaigns/Community mobilization sessions	Community gatherings are held once a week across the country during which local leaders make announcement about national programs (e.g. school feeding) and community interventions (e.g. small stock distribution). Occasionally, these gatherings include educational sessions about proper nutrition.
3. Early Childhood Development (ECD) centers	These community centers provide services to children 3 to 6 years old to prevent delay in brain stimulation and to ensure healthy growth before primary school. Services include: education, nutrition, sanitation, and protection. ECDs also provide support to pregnant and breastfeeding women through education sessions.
4. Exclusive breastfeeding promotion	Counselling about exclusive breastfeeding until 6 months and proper complementary feeding practices is given at ANC visits, ECDs, and community sessions with community health workers (CHWs).
5. Farmer Field Schools (FFS)	This agricultural extension program recruits and trains facilitators in best agricultural practices to pass on to other farmers in their communities. FFS facilitators use small plots of

 doi:10.20944/preprints202405.0572.v1

	land (demo plots) to demonstrate planting local , nutritious crops and using modern and sustainable farming techniques.
6. Fruit trees	This campaign aims to mobilize every household in Rwanda to plant at least three different fruit trees to encourage fruit consumption in the home. The campaign also encourages schools and public offices to plant trees on their property to set an example in the community.
7. Kitchen gardens	This program mobilizes households to use a small plot on their land or in their homes to plant local and nutritious vegetables reserved for home consumption. Public institutions, such as schools and district offices, must also have model kitchen gardens on their property where demonstrations can take place on how to initiate and maintain a kitchen garden.
8. NCD prevention and physical activity promotion	At least one mass sports event is organized monthly in all districts followed by an education session on the importance of physical activity and proper nutrition to prevent overweight and obesity.
9. Nutrition-Sensitive Direct Support (NSDS) and Shisha Kibondo	NSDS is a cash transfer scheme targeting poor households with pregnant women and/or children under 2 years to purchase nutritious foods and health services. Shisha Kibondo, a fortified blended food (FBF), is a maize-corn blend with vitamin/mineral premix given to women from vulnerable households who have a child identified as malnourished.
10. School feeding program	The aim of this program is to ensure that every Rwandan child receives at least one healthy meal per day if they attend school. The average cost of a base meal for one child is 150 RWF. While the government subsidizes some of this cost per child (56 RWF), the child's parents are responsible for covering the rest. Parents unable to contribute money can choose to contribute food, materials, or small jobs instead.
11. Small stock distribution	Distribution of small stock (pigs, poultry, sheep, goats) to vulnerable families is led by youth and women cooperatives. The goal is to increase access to manure and income among vulnerable families. The beneficiaries of these programs are selected by the community during community gatherings.

 doi:10.20944/preprints202405.0572.v1

12. Trainings (caregivers, teachers, CHWs)	Caregivers, teachers, and CHWs attend trainings on a variety of topics including nutrition and preparation of healthy diets that are organized by government or development partners and usually occur 1-3 times per year.

Appendix D. Final SWOT Analysis Tables

D1. Antenatal Care Visits and Counselling.

STRENGTHS	WEAKNESSES
S1. CHW education sessions ensure they are well trained **S2**. Free iron and folic acid supplements provided to pregnant women **S3**. Household visits by CHWs encourage attendance and ensure women are following advice **S4**. Local leaders and para-socialsS encourage ANC visit attendance **S5**. Shisha Kibondo provided at visits	**W1**. Some women don't attend sessions or only attend few **W2**. No budget for providing incentives for attendance
OPPORTUNITIES	**THREATS**
O1. Increase recommended number of ANC visit from 4 to 8 **O2**. Provide incentives for attending ANC visits (e.g. soaps, umbrellas) **O3**. Change micronutrient (Fe, FA) supplement pack to only last 1 month instead of 2 **O4**. CHWs conduct household visits to pregnant women on a monthly basis **O5.** Provide Information Education Communication sessions at health centres (family planning, nutrition, maternal health)	**T1**. Superstition about showing pregnancy (women hide pregnancy out of fear) **T2**. Mindset (misunderstanding that health centres are for sick people) **T3**. High cost of healthy food and belief that nutritious food is only for wealthy people **T4**. Lack of health insurance **T5**. Women are working and have no time to attend ANC sessions **T6**. Women have many children and cost of feeding them healthy meals is too high **T7**. Women delay ANC visits to avoid having to pay for all sessions

D2. Awareness Campaigns/Community Mobilization Sessions.

 doi:10.20944/preprints202405.0572.v1

STRENGTHS	WEAKNESSES
S1. Knowledge of healthy diet has improved since NICE social marketing campaign (Neeza), especially due to brand recognition **S2**. People are motivated to learn and apply changes when campaigns are well designed **S3**. Collaboration with local government or leaders to run mobilization (e.g. church leaders)	**W1**. Low attendance at mobilization/education sessions especially among most vulnerable households **W2**. Low male or father engagement
OPPORTUNITIES	**THREATS**
O1. Target awareness campaigns to places of work or homes **O2**. Include memorable taglines, logos, images, etc. in campaigns **O3**. Provide uniforms for CHWs leading education sessions **O4**. Run radio programs and mobilization sessions to encourage men specifically to partake in nutrition interventions (men encouraging men) **O5.** Use physical demonstrations at community gatherings (e.g. how to prepare a balanced diet, how to practice proper hygiene)	**T1**. No time to attend campaigns or education sessions in the community **T2**. Lack of trust or respect for facilitators leading the education sessions **T3**. Lack of capacity or confidence to implement lessons taught through mobilization

 doi:10.20944/preprints202405.0572.v1

D3. Early Childhood Development (ECD) Centres.

STRENGTHS	WEAKNESSES
S1. Parents see changes in children and are motivated to follow ECD model at home **S2**. Home visits show that parents start implementing kitchen gardens after seeing them at ECDs **S3**. Training of ECD caregivers improves quality of services and trainings	**W1**. Low parent monetary contribution **W2**. Inconsistent and unequal support across ECDs (meals, materials, caregiver support) **W3**. Not enough food at ECDs for all children **W4**. Lack of fruits and animal products in meals provided at ECDs
OPPORTUNITIES	**THREATS**
O1. Option for parents to make non-monetary contributions (food; firewood and charcoal; cooking, cleaning, gardening services) **O2**. Increased trainings for caregivers (ensuring continuous education) **O3**. Increased parent involvement (e.g. parents form groups to raise money to improve ECDs) **O4**. Income or incentives for caregivers (money is best incentive even if small amount) **O5.** Close follow-up (home visits to monitor changes or adoption of practices) **O6**. Provide incentives for caregivers to attend trainings **O7**. Introduce attractive new topics for different trainings based on what caregivers want	**T1**. Shared mindset that ECDs are a government program and responsibility **T2**. High cost of healthy food at market (high price volatility) **T3**. Lack of sufficient funding **T4**. Caregivers not compensated or incentivized to attend trainings and many do not have the time **T5.** Stock-outs (porridge stock-outs lead to drop-outs or ECD closures) **T6.** Lack of long-term program sustainability without partner or government support **T7**. Inconsistent government budget (leads to stock-outs) **T8**. Lack of knowledge (parents do not know or value proper ECD services) **T9.** Parents do not have the time to attend ECD trainings or education sessions

D4. Exclusive Breastfeeding.

 doi:10.20944/preprints202405.0572.v1

STRENGTHS	WEAKNESSES
S1. Education materials (books) about 1000 days and proper breastfeeding **S2**. Growth monitoring program is effective and complemented with breastfeeding education	**W1**. Some lactating mothers are malnourished and don't have enough breastmilk to feed **W2**. Some poor mothers choose to leave baby at home to find work
OPPORTUNITIES	**THREATS**
O1. Provide Shisha Kibondo or FBF to malnourished pregnant or lactating women to help them improve nutrition status **O2**. Encourage women to leave breast milk at home when going to work **O3**. Designated spaces for breastfeeding (at workplaces, in public spaces) **O4**. Education about importance of breastfeeding at community gatherings	**T1**. Lack of knowledge about breastfeeding **T2**. Mothers have to work and are out of the house from early morning until evening **T3**. Mothers lack of trust or confidence in letting others feed their babies for them

D5. Farmer Field Schools.

STRENGTHS	WEAKNESSES
S1. SMS reminders for farmers (when to top dress, weed, harvest) work well when in-person follow-up is impossible **S2.** Model plot hands-on demonstrations effective at engaging farmers **S3**. Farmers reached through the program are motivated to learn new methods	**W1**. Animal products are the first thing farmers sell on the market (not kept for at-home consumption) **W2**. Lack of feed industry in many districts results in high costs and long wait times to acquire feed **W3.** Often there are not enough trained FFS facilitators to cover all farmers
OPPORTUNITIES	**THREATS**
O1. Improved quality of feed for small stock (alternative methods e.g. black soldier flies)	**T1.** Farmers prioritize selling production to buy land or other inputs rather than consuming it

 doi:10.20944/preprints202405.0572.v1

O2. Continuous education for farmers and follow-up from FFS facilitators **O3.** More frequent and recurring trainings for FFS facilitators on best practices and on facilitation	**T2**. Farmers who don't receive follow-up become disincentivized to continue implementing best practices **T3.** Inputs and feed are expensive on the market (organic fertilizers especially) **T4**. Shared mindset to value quantity of production over quality **T5.** Belief that nutritious food is for wealthy people **T6.** Small stock often fall ill (due to bad practices or poor quality of feed)

D6. Fruit trees.

STRENGTHS	**WEAKNESSES**
S1. Government initiative to have 3 fruit trees per household has increased adoption significantly	**W1**. Low survival rate of fruit trees (animals destroy them, lack of proper care, etc.)
OPPORTUNITIES	**THREATS**
O1. Provide seeds or seedlings as small but long-term investment **O2**. Invest in improving the quality of fruit tree seeds (e.g. modified seeds) with lower inputs and land needs **O3**. Increase adoption of trees in kitchen and school gardens **O4**. Increase mobilization about nutritional and economic benefits (diversified diet and income) **O5**. Collaborate with local government and leaders (especially on modified seeds) **O6**. Provide discounted seedlings over free fruit (higher success rate)	**T1**. Lack of land to plant trees (in homes and schools) **T2**. Selling fruit on the market to buy other foods instead of feeding first to the family **T3**. Lack of monitoring and follow-up (survival rate is low because no one is held accountable) **T4**. Inputs are expensive (organic fertilizer especially) **T5**. Disasters and shocks (Russia-Ukraine war, COVID, floods)

 doi:10.20944/preprints202405.0572.v1

D7. Kitchen gardens.

STRENGTHS	WEAKNESSES
S1. Model gardens at ECDs and in community serve as education opportunities to parents and incentivize them to start their own kitchen gardens **S2**. People are motivated to adopt changes and keep food for families	**W1**. Low adoption in urban areas where families do not have sufficient space or capacity in their homes
OPPORTUNITIES	**THREATS**
O1. Increase education sessions about specific nutritious vegetables easy to grow in small spaces **O2**. Increase education sessions and demonstrations about how to prepare meals with vegetables from garden **O3**. Scale up school and ECD gardens **O4**. Close follow-up at people's homes to monitor adoption and improvements **O5**. Provide vegetable seeds to parents of children with SAM with education on how to grow and eat them **O6**. Mobilization about the benefits of vegetables and fruits for at-home consumption **O7.** Make free manure available for collection at public dumping sites for biological waste (Rusizi)	**T1**. Many families discouraged by lack of land or capacity **T2**. Gender-based violence and family conflict prevent women from making changes or decisions in the home **T3**. Urbanization results in smaller land per household **T4**. Costs including bags for soil, manure, transportation **T5**. Families prioritize selling produce from gardens instead of consuming **T6**. Women don't have time to add more responsibilities to their home duties

D8. NCD prevention programs.

STRENGTHS	WEAKNESSES
S1. Mass sport sessions organized every month followed by health education sessions	**W1**. Little awareness or acceptance of NCDs and obesity as a nutrition-related problem

 doi:10.20944/preprints202405.0572.v1

about proper nutrition for NCD and obesity prevention (reduce oils, sugar, salt) **S2**. Growing awareness of the risks of overweight and obesity **S3**. Good participation in sports among youth (Rubavu especially) **S4**. Health care practitioners at health centres educated and trained about NCD prevention	**W2**. Low participation in sports among women **W3**. No specific interventions exist to encourage women to exercise despite them being at the highest risk of overweight and obesity
OPPORTUNITIES	**THREATS**
O1. Encourage women to exercise and participate in sports **O2**. Women leaders in sports (e.g. teachers at schools) **O3**. Increase education and awareness about health risks of overweight and obesity and links to NCDs **O4**. Hold physical competitions in schools and in the community	**T1.** Adults less motivated to participate in physical activity than youth **T2**. Mindset that being overweight is a sign of wealth **T3**. Women are ashamed or embarrassed to exercise in public **T4**. Exercise activities and sports are predominantly run by and for men **T5**. Women stop exercising and change diets after marriage and pregnancy **T6**. Women have no time to participate in physical activity and do not see it as a priority

D9. NSDS and Shisha Kibondo.

STRENGTHS	WEAKNESSES
S1. Stunting prevention measures taken before birth and continued into childhood	**W1**. Big families with many children rarely see effects of Shisha Kibondo as they are often distributing the Shisha Kibondo among all children in the household rather than only serving to the malnourished child
OPPORTUNITIES	**THREATS**

 doi:10.20944/preprints202405.0572.v1

O1. Close monitoring through home visits to ensure Shisha Kibondo is properly prepared and consumed **O2**. More holistic support to vulnerable family instead of to just one child **O3**. Administer Shisha Kibondo outside the home, e.g. directly in health facilities or ECDs	**T1**. Provides contradictory messaging to family planning interventions **T2**. Beneficiaries sell Shisha Kibondo rather than consuming it **T3**. Beneficiaries dilute and share Shisha Kibondo among many children at home **T4**. Forgotten age group (support lasts only until 2 years)

 doi:10.20944/preprints202405.0572.v1

D10. School feeding program.

STRENGTHS	WEAKNESSES
S1. Non-monetary contributions by parents can help subsidize school meals (e.g. small fish, peanuts, sweet potatoes) **S2**. Parent meetings and mobilization increase awareness, motivation, and contributions **S3**. Daily school meals have improved school attendance and focus in class	**W1**. Low parent contribution **W2**. Lack of animal products or vegetables or fruits in the menu (always maize, beans, rice, potatoes, soya)
OPPORTUNITIES	**THREATS**
O1. Increase collaboration between parents and school to increase contribution and involvement **O2**. Increase collaboration with local government or leaders to encourage parents **O3**. Run trainings at schools for parents on starting and maintaining vegetable gardens **O4**. Increased kitchen and eating materials to meet demand (e.g. "muvero", plates, utensils, cooking needs).	**T1**. Parents, especially those with many children, are unwilling or cannot afford to contribute to the program (contribution is per child) **T2**. Mindset that school feeding is government's responsibility **T3**. No specific room for eating (refectory) **T4**. Lack of trust or respect for teachers or school feeding committee **T5**. Lack of kitchen materials (makes food preparation time consuming)

D11. Small stock distribution.

STRENGTHS	WEAKNESSES
S1. Livestock to poor families (Girinka) has shown impressive improvements in nutrition **S2**. Diversification in income **S3.** Population decides who to prioritize for small stock	**W1**. Farmers don't replace livestock after they die or are sold **W2**. Livestock are not well cared for or fed and fall sick
OPPORTUNITIES	**THREATS**

 doi:10.20944/preprints202405.0572.v1

O1. Complement livestock (Girinka) program with small stock (chicken, birds, rabbits, goats) given their shorter reproduction rate, easier handling, and less expensive care **O2**. Complement livestock (Girinka) program with fruit tree seedling program (agroforestry) to diversify income **O3**. Close follow-up and monitoring to encourage farmers not to sell animals **O4**. Select groups and farmers who have proven to be responsible to be recipients	**T1**. Many discouraged by lack of capacity (old, weak, physically disabled) **T2.** Mindset that program is responsibility of the government or partners (unsustainable) **T3**. Lack of land and shelter **T4**. Farmers will sell production rather than keeping or reserving for home consumption **T5**. Poor quality of feed or high cost of feed due to no local producer **T6**. Insufficient veterinarians or inadequate veterinary services in rural areas

D12. Trainings (teachers, CHWs, caregivers).

STRENGTHS	**WEAKNESSES**
S1. Trainings provided to CHWs and ECD caregivers from various partners covering a range of nutrition topics (balanced diet, growing vegetables, 1000 days, etc.) **S2**. CHWs also act as community facilitators and share learnings from trainings in community **S3**. CHWs and caregivers are enthusiastic about trainings	**W1**. Trainings are too few and not repeated enough
OPPORTUNITIES	**THREATS**
O1. Introduce attractive new topics in different trainings (e.g. how to grow new nutritious vegetables like mushrooms) **O2**. Have new faces giving trainings **O3**. Provide incentives for caregivers and CHWs to attend trainings (bus tickets for transportation, free books or materials)	**T1**. Caregivers and CHWs not compensated or **incentivized** for attending trainings, many do not have the time **T2**. Lack of follow-up or refresher trainings hinder long-term learning

 doi:10.20944/preprints202405.0572.v1

O4. Provide more materials for use during and after trainings to improve long-term learning (e.g. 1000 Days book) **O5**. Increase refresher trainings and continuous education	

 doi:10.20944/preprints202405.0572.v1

Appendix E. Recommendations by Program

Recommendations by Program	SWOTs Addressed
1. Antenatal Care Visits and Counseling	
R1. Provide rewards for women who attend all 8 ANC visits	**O1, O2, W1, T2**
R2. Open egg or small fish retailer next to health centres with discounted prices for women who attend ANC visits where they can place orders to pick up at their next visit	**O1, O2, W1, W2, T3, T6**
R3. Incorporate family planning and mental health counselling at visits	**S1, O5, T1, T2, T3, T6**
R4. Facilitate the formation of community groups for pregnant women with assigned CHWs	**S1, S3, S4, O4, T1, T2, T6**
2. Awareness Campaigns/Community Mobilization Sessions	
R1. Conduct mobilization sessions and awareness campaigns at places of work (cross-border market, in the field, etc.) or community spaces (e.g. churches)	**S3, O1, W1, T1**
R2. Use radio programs and mobilization sessions to encourage men to participate in nutrition and health interventions	**W2, O4, T2**
R3. Design awareness campaigns that are recurring and recognizable (e.g. include logos, repeated taglines, images, posters)	**S1, S2, O2**
R4. Collaborate with local leaders (e.g. church leaders, community leaders) to promote messages of campaign in their spaces	**S3, W1, O1, T1, T2**
R5. Provide uniforms with recognizable logo to community facilitators or CHWs leading education sessions	**S2, O3, T2**
R6. Incorporate physical demonstrations into mobilization campaigns whenever possible	**S2, O5, T3**
3. Early Childhood Development Centres	
R1. Increase basic materials and improve management of home-based ECDs	**W2, O1, T3**

 doi:10.20944/preprints202405.0572.v1

R2. Consult with caregivers on which skills or topics they want training on and provide them with incentives to attend trainings. Possible incentives could include transport allowances or free manuals and educational materials to take home.	**S3, W2, O2, O4, O6, O7, T4**
R3. Assign roles and responsibilities to parents, especially fathers, to increase involvement and contribution. Help parents set up Saving Lending Committees (SLCs) to pool money for ECD resources and porridge or milk programs. Create a transparency program in SLCs to ensure parents see how budget is managed and complement these groups with SBC campaign to explain importance of parent contribution to ECDs.	**S1, S2, S4, W1, W2, W3, W4, O1, O3, T1, T2, T3, T5, T6, T7, T8**
R4. Establish links between ECDs and Farmer Field Schools (FFS) for local procurement and agricultural education sessions for caregivers. This can be done through food system platform and farmer hubs.	**S1, S2, S3, W4, O2, T6**
R5. Ensure all centers engage in at-home follow-up with households to ensure that parents are adopting ECD lessons on healthy diets and lifestyle practices at home	**S2, O5, T8, T9**
4. Exclusive Breastfeeding	
R1. Encourage women to leave breastmilk at home when they go to work and educate other household members on proper feeding practices	**W2, O2, T3**
R2. Increase maternity leave (currently at 12 weeks)	**W2, T2, T3**
R3. Provide designated spaces for breastfeeding in workplaces and in community (e.g. at marketplaces)	**O3, T2, T3**
R4. Increase CHW and health centre supply of books and educational materials about breastfeeding and 1000 Days	**S1, O4, T1**
R5. Incorporate education about exclusive breastfeeding and proper maternal nutrition at community gatherings combined with growth monitoring (not just for women at ANC visits)	**S2, O1, O4, T1, T3**
5. Farmer Field Schools	
R1. Scale up SMS reminders for farmers to ensure guidance is followed after trainings and to encourage them not to sell their production	**S1, W1, W3, O2, T2, T5**
R2. Help in recruiting more FFS facilitators	**W3, O2, T2**

 doi:10.20944/preprints202405.0572.v1

R3. Help in recruiting and training "model" or "example" farmers to pass on skills and educate community about nutrition (e.g. how to diversity meals, raise livestock, reserve animal products for home consumption)	**S2, S3, W1, W3, O2, T1, T2, T4, T6**
R4. Increase the number and frequency of trainings and provide regular refresher sessions for FFS facilitators to sustain their motivation and encourage continuous learning.	**S2, S3, W3, O3**
R5. Invest in establishing local feed industry and in research into new feed alternatives (e.g. rearing Black Soldier Flies as low-input low-cost option)	**W2, O1, T1, T3, T4, T6**
6. Fruit Trees	
R1. Work jointly with local government to invest in improved, modified seeds (require less inputs and land)	**W1, O2, O5, T1, T4**
R2. Phase out distributing seedlings to vulnerable families and replace with providing seedlings at a discounted price. Possibly include condition for future "payback" with fruit after a certain number of years	**O1, O6**
R3. Complement seedling distribution or discounted sales with a local mobilization campaign about importance of including fruits in the diet and incentivize keeping them for home consumption	**O3, O4, O5, T2**
R4. Help schools and ECDs find land in the community to plant fruit trees to supplement school feeding	**O3, T1**
7. Kitchen Gardens	
R1. Increase education sessions about best practices to grow vegetables on very small plots of land	**W1, O1, T1, T3**
R2. Provide seeds, bags, or soil needed to initiate kitchen gardens as incentives	**W1, O5, T1, T4**
R3. Scale up model plots and gardens in community (e.g. at ECDs) used for educational and training purposes. Complement this with awareness campaigns and mobilization about benefits of vegetables in the diet and reserving production for at-home consumption	**S1, S2, O1, O2, O3, O6, T1, T5**
R4. Assist families in accessing free or subsidized organic manure	**W1, O7, T1, T4**

 doi:10.20944/preprints202405.0572.v1

R5. Encourage male participation in adopting and maintaining kitchen gardens and attendance at nutrition education sessions (e.g. men-targeted awareness campaigns at homes or places of work)	**S2, O6, T2, T6**
8. NCD Prevention and Physical Activity	
R1. Organize separate mass sport events or physical competitions for youth and adults, always complemented by education session	**S1, S2, S3, W1, O4, T1**
R2. Target women specifically to exercise through behavior change communication strategy which emphasizes the link to positive impact on children	**S1, S2, W1, W2, W3, O1, T1, T3, T4, T5, T6**
R3. Focus on setting women as examples in sports	**W2, W3, O1, O2, T3, T4, T5, T6**
R4. Incorporate physical activity interventions run by female teachers and education about healthy diet for NCD prevention into school feeding program	**S2, S3, W1, O2, O3, O4, T2**
R5. Incorporate physical activity and sports events targeting women into programs and activities that women already attend (e.g. health centre gatherings)	**S1, S2, W2, W3, O1, T2, T3, T4, T5, T6**
9. Nutrition-Sensitive Direct Support (NSDS) and Shisha Kibondo	
R1. Complement any monetary support with targeted education about family planning and/or facilitated access to contraceptives. Extend support until the child has reached 3 years of age instead of 2.	**S1, W1, O2, T1, T4**
R2. Base quantity of Shisha Kibondo provided on household size of beneficiary rather than on quantity needed for one child only	**W1, O2, T3**
R3. Initiate Shisha Kibondo at ECDs as an opportunity to teach parents how to administer it properly at home. Eventually transition to distribution at homes with close follow-up	**S1, W1, O1, O2, O3, T2, T3**
10. School feeding program	
R1. Encourage monetary and non-monetary parent contributions through mobilization and at-home visits	**S1, S2, W1, O1, O3, T1, T2, T4**

 doi:10.20944/preprints202405.0572.v1

R2. Increase collaboration between parents, local leaders, and school teachers to help cultivate trust and support them in stablishing SLCs to pool money for resources to improve school feeding. Create a transparency program in SLCs to ensure parents see how budget is managed and complement these groups with SBC campaign to explain importance of parent contribution to school feeding	**S1, S2, W1, W2, O1, O2, T1, T2, T4, T5**
R3. Invest in building or finding designated eating spaces at schools (refectories) and in acquiring sufficient kitchen and cooking materials to meet demand	**O4, T3, T7**
R4. Establish links with Farmer Field Schools (FFS) for local procurement and agricultural education sessions (e.g. kitchen garden trainings)	**W1, W2, O2, O3, T4**
11. Small Stock Distribution Program	
R1. Replace or complement Girinka with small stock (chicken, rabbits, goats) using a sustainable business approach instead of distribution for free. Complement program with demand generation strategy to create consumer awareness about importance of animal products in the diet	**S2, O1, O4, T2**
R2. Combine livestock program with agroforestry initiatives (fruit seedlings at a discounted price)	**S2, O2, W2, T5**
R3. Involve entire family (youth especially) in trainings on livestock care	**W1, W2, T1**
R4. Invest in establishing local feed industry or in research into and adoption of new feed alternatives (e.g. rearing Black Soldier Flies as low-input low-cost option)	**W2, T5**
R5. Engage in close follow-up after distribution to ensure farmers are taking proper care of their livestock and to discourage them from selling	**W1, O3, T4**
R6. Help strengthen the veterinary system at the community level	**W1, W2, T6**
R7. Implement small stock distribution within structure of farmers hubs established by NICE project	**S3, O4, T2**
12. Trainings (CHWs and caregivers)	
R1. Consult with CHWs and caregivers on which trainings they want more of	**S2, S3, O1, O3, T1**

 doi:10.20944/preprints202405.0572.v1

R2. Provide more refresher classes and consistent repetitions of trainings	**S3, W1, O2, O5, T2**
R3. Implement a form of exam or evaluation for CHWs to test their knowledge following trainings and/or provide a certification at the end of the training	**S1, S2, O3, O5, T1, T2**
R4. Increase materials used at trainings to promote long-term learning and review (e.g. books, brochures, take-home materials)	**S2, S3, W1, O3, O4, T1**
R5. Provide incentives for CHWs or caregivers to attend trainings given that they are not compensated (e.g. bus tickets for transportation, free manual or educative materials to take home)	**S3, W1, O3, O4, T1**

References

1. World Health Organization. *The Double Burden of Malnutrition: Policy Brief*; World Health Organization, 2016.
2. Alem, A. Z.; Yeshaw, Y.; Liyew, A. M.; Tessema, Z. T.; Worku, M. G.; Tesema, G. A.; Alamneh, T. S.; Teshale, A. B.; Chilot, D.; Ayalew, H. G. Double Burden of Malnutrition and Its Associated Factors among Women in Low and Middle Income Countries: Findings from 52 Nationally Representative Data. *BMC Public Health* **2023**, *23* (1), 1479. https://doi.org/10.1186/s12889-023-16045-4.
3. Ministry of Health; Rwanda Biomedical Centre. National Strategy and Costed Action Plan for the Prevention and Control of Non-Communicable Diseases in Rwanda 2020-2025, 2020.
4. Thow, A. M.; Kadiyala, S.; Khandelwal, S.; Menon, P.; Downs, S.; Reddy, K. S. Toward Food Policy for the Dual Burden of Malnutrition: An Exploratory Policy Space Analysis in India. *Food Nutr. Bull.* **2016**, *37* (3), 261–274. https://doi.org/10.1177/0379572116653863.
5. Hawkes, C.; Ruel, M. T.; Salm, L.; Sinclair, B.; Branca, F. Double-Duty Actions: Seizing Programme and Policy Opportunities to Address Malnutrition in All Its Forms. *The Lancet* **2020**, *395* (10218), 142–155. https://doi.org/10.1016/S0140-6736(19)32506-1.
6. Kate Kennedy-Wood; Silvia Holschneider. From Double Burden to Double Duty: Policy Implications of Double-Duty Actions to Address the Full Spectrum of Malnutrition; Summary of technical consultation; World Bank Group, 2021.
7. National Policies and Plans to Address the Dual Burden of Malnutrition: A Multi-Country Policy Review; SPRING, 2018.
8. Batal, M.; Deaconu, A.; Steinhouse, L. The Nutrition Transition and the Double Burden of Malnutrition. In *Nutritional Health: Strategies for Disease Prevention*; Temple, N. J., Wilson, T., Jacobs, Jr., David R., Bray, G. A., Eds.; Springer International Publishing: Cham, 2023; pp 33–44. https://doi.org/10.1007/978-3-031-24663-0_3.
9. Erzse, A.; Goldstein, S.; Norris, S. A.; Watson, D.; Kehoe, S. H.; Barker, M.; Cohen, E.; Hofman, K. J. Double-Duty Solutions for Optimising Maternal and Child Nutrition in Urban South Africa: A Qualitative Study. *Public Health Nutr.* **2021**, *24* (12), 3674–3684. https://doi.org/10.1017/S1368980020002426.
10. The World Factbook. Rwanda, 2023.
11. Britannica, The Information Architects of Enyclopaedia. Rwanda, 2023. https://www.britannica.com/facts/Rwanda.
12. World Food Programme. Rwanda Annual Country Report: Country Strategic Plan 2019-2024, 2022.
13. Iruhiriy, E.; Olney, D. K.; Ramani, G. V.; Heckert, J.; Niyongira, E.; Frongillo, E. A. Stories of Change: Rwanda: Understanding How Rwanda Created an Enabling Environment for Improvements in Nutrition and the Challenges That Remain, 2019.
14. Committee on World Food Security (CFS). *New HLPE-FSN drafting team on uran and per-urban food systems*. HLPE. https://www.fao.org/cfs/cfs-hlpe/insights/news-insights/news-detail/new-hlpe-fsn-drafting-team-on-urban-and-peri-urban-food-systems/en.

15. Joseph Nkurunziza Ryarasa. City Context Assessment: Rwandan Report for the Secondary Cities of Rubavu and Rusizi, 2021.
16. Swiss Development and Cooperation Center (SDC). Nutrition in City Ecosystems: The Project Factsheet, 2022. https://nice.ethz.ch/wp-content/uploads/2022/11/NICE_Project_Factsheet_Final.pdf.
17. Barth-Jaeggi, T.; Speich, C.; Havugimana, C.; Bayisenge, F.; Kimenju, S.; Omondi, W.; Pasha, S. F.; Islam, S.; van Zutphen-Küffer, K. G.; van den Berg, S.; Barjolle, D.; Pannatier, M.; Prytherch, H. Nutrition Transition, Double Burden of Malnutrition, and Urbanization Patterns in Secondary Cities of Bangladesh, Kenya and Rwanda. *BMC Nutr.* **2023**, *9* (1), 125. https://doi.org/10.1186/s40795-023-00782-1.
18. World Health Organization. Global Nutrition Policy Review 2016-2017: Country Progress in Creating Enabling Policy Environments for Promoting Healthy Diets and Nutrition; World Health Organization: Geneva, 2018.
19. Harris, J. E.; Gleason, P. M.; Sheean, P. M.; Boushey, C.; Beto, J. A.; Bruemmer, B. An Introduction to Qualitative Research for Food and Nutrition Professionals. *J. Am. Diet. Assoc.* **2009**, *109* (1), 80–90. https://doi.org/10.1016/j.jada.2008.10.018.
20. Horton, J.; Macve, R.; Struyven, G. Chapter 20 - Qualitative Research: Experiences in Using Semi-Structured Interviews1. In *The Real Life Guide to Accounting Research*; Humphrey, C., Lee, B., Eds.; Elsevier: Oxford, 2004; pp 339–357. https://doi.org/10.1016/B978-008043972-3/50022-0.
21. Dhakal, K. NVivo. *J. Med. Libr. Assoc. JMLA* **2022**, *110* (2), 270–272. https://doi.org/10.5195/jmla.2022.1271.
22. Skinner, K.; Hanning, R. M.; Sutherland, C.; Edwards-Wheesk, R.; Tsuji, L. J. S. Using a SWOT Analysis to Inform Healthy Eating and Physical Activity Strategies for a Remote First Nations Community in Canada. *Am. J. Health Promot. AJHP* **2012**, *26* (6), e159-170. https://doi.org/10.4278/ajhp.061019136.
23. Williams, P. A.; Schnefke, C. H.; Flax, V. L.; Nyirampeta, S.; Stobaugh, H.; Routte, J.; Musanabaganwa, C.; Ndayisaba, G.; Sayinzoga, F.; Muth, M. K. Using Trials of Improved Practices to Identify Practices to Address the Double Burden of Malnutrition among Rwandan Children. *Public Health Nutr.* **2019**, *22* (17), 3175–3186. https://doi.org/10.1017/S1368980019001551.
24. Valerie L. Flax; Emily Ouma; Lambert Izerimana; Mary-Ann Schreiner; Alice O. Brower; Eugene Niyonzima; Carine Nyilimana; Adeline Ufitinema; Agnes Uwineza. Animal Source Food Social and Behavior Change Communication Intervention Among Girinka Livestock Transfer Beneficiaries in Rwanda: A Cluster Randomized Evaluation. *Glob. Health Sci. Pract.* **2021**, *9* (3), 640. https://doi.org/10.9745/GHSP-D-21-00082.
25. Farnworth, C. R.; Jumba, H.; Otieno, P. E.; Galiè, A.; Ouma, E.; Flax, V. L.; Schreiner, M.-A.; Colverson, K. Gender Roles and Masculinities in Leveraging Milk for Household Nutrition: Evidence from Two Districts in Rwanda. *Food Policy* **2023**, *118*, 102486. https://doi.org/10.1016/j.foodpol.2023.102486.
26. Gender Monitoring Office. Gender and Agriculture, 2017.
27. Menon, S.; Peñalvo, J. L. Actions Targeting the Double Burden of Malnutrition: A Scoping Review. *Nutrients* **2019**, *12* (1). https://doi.org/10.3390/nu12010081.
28. United Nations World Food Programme; National Institute of Statistics of Rwanda (NISR) [Rwanda], Ministry of Health (MOH) [Rwanda], and ICF; Ministry of Agriculture and Animal Resources. Comprehensive Food Security and Vulnerability Analysis 2021, 2021.
29. Kesso Gabrielle van Zutphen; Dominique Barjolle; Sophie van den Berg; Bredo Gavin-Smith; Klaus Kramer; Capucine Musard; Helen Prytherch; Johan Six; Simon Winter; Kris Woltering. *Secondary Cities as Catalysts for Nutritious Diets in Low- and Middle-Income Countries*; Center for Development Research (ZEF) in cooperation with the Scientific Gropu for the UN Food System Summit 2021: Bonn, 2021.