Report of the Stakeholder Mapping and Crop Prioritization workshop for the BOLDER Project on Neglected and Underutilized Species (NUS)

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Moureen Awori, Daudi Mubiru and Gloria Otieno

Building Opportunities for Lesser-known Diversity in Edible Resources (BOLDER)

A Report of the Stakeholder Mapping and Crop Prioritization workshop for the BOLDER Project on Neglected and Underutilized Species (NUS) in Tanzania

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Arusha, Tanzania

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Alliance of Bioversity International and CIAT (ABC)

2024

The Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT) delivers research-based solutions that address the global crises of malnutrition, climate change, biodiversity loss, and environmental degradation.

The Alliance focuses on the nexus of agriculture, nutrition and environment. We work with local, national and multinational partners across Africa, Asia, and Latin America and the Caribbean, and with the public and private sectors and civil society. With novel partnerships, the Alliance generates evidence and mainstreams innovations to transform food systems and landscapes so that they sustain the planet, drive prosperity, and nourish people in a climate crisis.

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We also acknowledge the active participation and engagement of all attendees, whose contributions enriched the discussions and outcomes. The facilitation team, comprising Nora Castaneda and Juna Thimnu from Crop Trust, alongside co-facilitators from Alliance of Bioversity International & CIAT and WorldVeg, for skilfully guiding the workshop proceedings. Lastly, we appreciate the generous support from the Government of Tanzania, TPHPA, and the National Gene Bank for providing the venue and logistical assistance.

Contents

Acronyms and Abbreviations

ABC	Alliance of Bioversity International and CIAT
BOLDER	Building Opportunities for Lesser-known Diversity in Edible Resources
BSF	Benefit-Sharing Fund of the ITPGRFA
CSA	Climate-Smart Agriculture
CSBs	Community Seed Banks
EA	East Africa
Envirocare	Environmental, Human Rights Care and Gender Organisation
IITA	International Institute of Tropical Agriculture
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
MOA	Ministry of Agriculture
NM-AIST	The Nelson Mandela African Institution of Science and Technology
NPGRC	National Plant Genetic Resources Center
NUC	Neglected and Underutilized Crops
NUS	Neglected and Underutilized Species
PELUM	Participatory Ecological and Land Use Management
PGRFA	Plant Genetic Resources for Food and Agriculture
PPB	Participatory Plant Breeding
PPD	Public–Private Dialogue
TABIO	Tanzania Alliance for Biodiversity
TARI	Tanzania Agricultural Research Institute
TOSCI	Tanzania Official Seed Certification Institute
TPHPA	Tanzania Plant Health and Pesticides Authority
QDS	Quality Declared Seed
SUA	Sokoine University of Agriculture
TARI	Tanzania Agricultural Research Institute
TRICOT	Triadic Comparison of Technologies
UDSM	University of Dar ES Salaam Mwalimu Nyerere Main Campus
WFP	World Food Programme
WorldVeg	World Vegetable Center

Executive Summary

The Building Opportunities for Lesser-known Diversity in Edible Resources (BOLDER) initiative seeks to enhance nutrition security in West and East Africa by promoting underutilized, climate-resilient crops. Recently introduced as Work Package 7 within the Biodiversity for Opportunities, Livelihoods and Development project, BOLDER focuses on Neglected and Underutilized Species (NUS) to create diverse and sustainable food systems.

A stakeholder workshop in Tanzania convened 55 participants to identify priority **Neglected and Underutilized Species (NUS)** crops, develop comprehensive stakeholder lists, and define roles within NUS food systems. The workshop identified five key priority crops: **sweet potatoes**, **finger millet**, **Moringa**, **Bambara groundnuts**, and **Jute mallow**.Participants emphasized the importance of selecting crops with traits such as **pest and disease resistance**, **drought tolerance**, **high nutritional value**, and **marketability**. These traits are critical for enhancing food security, improving nutrition, and ensuring the resilience and sustainability of local food systems. The collaborative efforts of stakeholders aimed to strengthen NUS integration into Tanzania's agricultural value chains and promote their broader adoption.

The **BOLDER project** will focus on conserving, characterizing, and evaluating **Neglected and Underutilized Species (NUS)** while enhancing their integration into sustainable agri-food systems and building the capacity of farmers and researchers. Key activities will include the development of **climate-resilient NUS crop varieties**, strengthening stakeholder engagement, supporting **Gene Banks**, promoting **market development**, and fostering **policy support** to create an enabling environment for NUS.

Collaboration among stakeholders will be crucial for the project's success. The initiative will demonstrate the potential for collective action in strengthening the role of resilient, underutilized crops within local food systems. By aligning stakeholder priorities, researchers, policymakers, and community leaders will develop targeted strategies to promote these crops, addressing future challenges related to food security, malnutrition, and sustainable livelihoods in Tanzanian communities.

The prioritized NUS crops will provide transformative opportunities to enhance livelihoods, build resilience, and secure food systems in the face of climate change. Through the implementation of the BOLDER project's recommendations, Tanzania will contribute to the establishment of resilient, multi-functional agri-food systems that support **diverse diets**, improve **nutrition**, and empower communities across Africa.

1 Background

The Building Opportunities for Lesser-known Diversity in Edible Resources (BOLDER) initiative, newly introduced as Work Package 7 within the Biodiversity for Opportunities, Livelihoods and Development (BOLD) project, represents an exciting step towards improving nutrition security in West and East Africa. This effort is focused on the value of nutritious, underutilized crops that are naturally resilient to climate change and environmentally sustainable. The project emphasizes that a heavy reliance on just a few staple crops can heighten the risk of micronutrient deficiencies and negatively affect the resilience of food systems. By expanding the diversity of crops grown and consumed, BOLDER aims to create food systems that are both diverse and sustainable.

Central to BOLDER's mission is the promotion of Neglected and Underutilized Species (NUS)—plant species often marginalized by mainstream agricultural research, breeding, and policy, despite their potential benefits. This initiative prioritizes NUS in Uganda, Tanzania, Benin, and Ghana, focusing on boosting national gene banks' technical capacities to conduct gap analyses and organize targeted collecting missions. Furthermore, BOLDER will evaluate selected NUS for cultivation and resilience to climate change. The project also includes innovative methodologies to analyze NUS value chains within local food systems, utilizing participatory approaches to ensure solutions are relevant and widely applicable. Through these initiatives, BOLDER seeks to build resilient, multi-functional agri-food systems that support diverse diets, enhance nutrition, and empower communities across Africa.

The purpose of the workshop was to conduct stakeholder consultations across selected countries— Tanzania, Uganda, Benin, and Ghana—to foster collaboration and insights on strengthening the role of underutilized, resilient crops within local food systems. These consultations brought together a diverse array of 55 stakeholders, including farmers and farmer groups, representatives from ministries responsible for health, agriculture, and nutrition, as well as research breeding programs, academia, government officials, international organizations, NGOs, community groups, private sector representatives, national gene banks and consultants, to share ideas and expertise, fostering collaboration to address common challenges. Through these varied perspectives, the workshop aimed to gather valuable input that would shape strategies for promoting nutritious, underutilized crops in sustainable and resilient food systems, addressing the unique needs and opportunities identified in each country

1.1 Workshop objectives

By Dr. Gloria Otieno – Alliance of Bioversity International and CIAT (ABC)

The objectives of the workshop included:

i) Identify and prioritize a list of four NUS crops for conservation and further research with stakeholders in a participatory manner
ii) To develop a comprehensive list of stakeholders in the NUS food systems taking into consideration conservation, seed production, breeding and variety development, food production and value chains and policy.
iii) To identify stakeholder roles and functions within the NUS food systems
iv) To have an overview of current existing NUS research, breeding value chains development or food systems issues being implemented by stakeholders
v) To identify areas of synergy and collaboration in the NUS food systems Research and Development (R&D) in each country.

1.2 Workshop Methodology

The workshop employed a comprehensive, two-day consultative approach to achieve its objectives. On the first day, stakeholders delivered presentations showcasing existing projects related to Neglected and Underutilized Species (NUS). This was followed by a stakeholder mapping exercise, which aimed to clearly delineate the roles and responsibilities of each stakeholder within the NUS food systems. The exercise facilitated a thorough understanding of the stakeholder landscape and fostered collaboration. On the second day, participants engaged in a NUS

prioritization exercise, which enabled them to identify and agree upon the four NUS crop species to focus on, along with their prioritized traits. This exercise ensured that the stakeholders' collective expertise informed the selection process, ultimately guiding the direction of future NUS initiatives.

1.3 Workshop participants and facilitators

The workshop brought together a diverse group of 55 seed system actors and stakeholders, with participants representing: Academic/Research Institutions: Sokoine University of Agriculture, Tanzania Agricultural Research Institute, University of Dar ES Salaam, and The Nelson Mandela African Institution of Science and Technology, Government Agencies: Tanzania Plant Health and Pesticides Authority, Ministry of Agriculture, Tanzania Official Seed Certification Institute, and Liwale District Council, International Organizations: IITA, World Vegetable Center, Alliance of Bioversity International and CIAT, Crop Trust, and ECHO-East Africa, Non-Governmental Organizations: SWISSAID Tanzania, Tanzania Alliance for Biodiversity, CARITAS, Envirocare, and Participatory Ecological and Land Use Management, Community-Based Organizations: MVIWAARUSHA and UMAWGU, Private Sector: Syova seed and Norges Vel, Consultants: Agro-ecology consultant and Other: IDP – Tanzania. The sessions were facilitated by Nora Castaneda and Juna Thimnu from Crop Trust, with additional support from co-facilitators from Alliance of Bioversity International & CIAT and WorldVeg.

Table 1. Workshop Participants Description

S/N	STAKEHOLDER CATEGORY	NUMBER OF PARTICIPANTS
1	Farmers	2
2	Academic/Research Institutions	13
3	Government Agencies	13
4	International Organizations	15
5	Non-Governmental Organizations (NGOs)	5
6	Community-Based Organizations	3
7	Private Sector	4
	TOTAL	**54**

The full list of participants is available in Annex 1 of this report.

The workshop presentations are available on this link: BOLDER TZ Presentations

The workshop pictures are available through this link: - https://flic.kr/s/aHBqjBUoQK

2 Welcome Remarks

By Mr. Laurence Mapunda (The National Plant Genetic Resources)

Mr. Laurence Mapunda of The National Plant Genetic Resources, under the Tanzania Plant Health and Pesticide Authority (TPHPA), kicked off the BOLDER meeting with a warm welcome. Speaking on behalf of the Curator and the Ministry of Agriculture, he acknowledged the significance of the gathering, focused on addressing challenges related to Neglected and Underutilized Species (NUS). Mr. Mapunda outlined the National Gene Bank's mission to preserve traditional crops, including NUS, and stressed the need for expert engagement in thorough analysis. He was encouraged by the diverse representation of organizations and looked forward to fruitful discussions and meaningful outcomes.

By Dr. Nora Castaneda (Crop Trust) - Facilitator

Dr. Nora Castaneda, facilitator and representative of the Crop Trust, warmly welcomed participants to the gathering. Originally from Colombia, South America, Dr. Castaneda shared her affiliation with Crop Trust, an international organization headquartered in Germany. She previewed her upcoming presentation, promising to delve into her work with Crop Trust and the BOLDER project. Dr. Castaneda expressed delight at the diverse assembly of stakeholders

united by their interest in Neglected and Underutilized Species (NUS). She extended her appreciation to The National Gene Bank, The World Vegetable Center, and The Alliance of Bioversity International and CIAT (ABC) for collaboratively organizing the event, setting the stage for productive discussions.

By Ms. Colleta Nduguru (The World Vegetable Center) – Host and co-facilitator

Ms. Colleta Nduguru, newly appointed representative and co-facilitator of the World Vegetable Center (WorldVeg), warmly welcomed participants to the gathering. As a Tanzanian national with a background in economics and agriculture, Ms. Nduguru expressed her enthusiasm for joining the WorldVeg team just two weeks prior and being part of this significant meeting. She highlighted the uniqueness of the gathering, emphasizing WorldVeg's interest in traditional vegetables, many of which are nearing extinction, and its alignment with Tanzania's national priorities. Ms. Nduguru encouraged participants to explore the Gene Bank facility and adjacent fields, inviting them to share their observations and feedback to enhance the facility's operations. With that, she extended a hearty welcome and wished participants a productive and successful deliberation.

By Dr. Gloria Otieno (The Alliance of Bioversity International and CIAT) – Co-facilitator

Dr. Gloria Otieno, co-facilitator from the Alliance of Bioversity International and CIAT, delivered warm welcome remarks, extending gratitude to Tanzanian colleagues from the National Gene Bank and World Vegetable Center for their invaluable support in providing the facility and assisting with workshop organization. Emphasizing the collaborative nature of the gathering, Dr. Otieno assured participants that the workshop would be highly participatory, fostering collective input to identify suitable NUS crops for future implementation. She contextualized the current research phase, focusing on data collection, crop prioritization, and assessing the availability of genetic materials in Gene Banks. Dr. Otieno highlighted that the actual project implementation would commence in a year, and one of the workshop's key objectives was to identify potential partners for future engagement, laying the groundwork for successful collaboration.

3 BOLDER Initiative project – objectives and components

By Dr. Nora Castaneda - Crop Trust

Dr. Nora Castaneda from Crop Trust presented the BOLDER Initiative, highlighting the Crop Trust's mission to conserve crop diversity for global food and nutrition security. Crop diversity, comprising traditional farmer varieties, is disappearing rapidly due to climate change. To address this, Crop Trust aims to ensure global conservation and availability of crop diversity.

Founded in 2004, Crop Trust partners with the International Plant Treaty, supports the Svalbard Global Seed Vault, and has a 20-year track record of connecting farmers and researchers with diverse seeds. Key achievements include:

- Long-term grants and partnerships
- $100 million diversity endowment fund
- 4,500+ seed samples collected
- $50 million for gene bank platforms
- 4.3 million gene bank samples made publicly available

Crop Trust collaborates with 150+ organizations in 48 countries, including Tanzania Gene Bank. The $20 million BOLDER project, funded by Norway, will run from 2024-2030 in Benin, Ghana, Uganda, and Tanzania, led by Alliance of Bioversity International and CIAT, World Vegetable Center, International Institute of Tropical Agriculture, and Norwegian University of Life Sciences.

3.1 Project goal and outputs.

The BOLDER initiative aims to improve ***nutrition security*** in West and East Africa by promoting the use and value of ***nutritious, underused, climate-resilient,*** and ***environmentally friendly*** crops. Key project outputs include:

- Secure conservation, characterization, and evaluation of Neglected and Underutilized Species (NUS), making

them accessible to breeders, researchers, and farmers.
- Enhanced use and value of NUS within sustainable agri-food systems.
- Improved support for NUS use among farmers and researchers through capacity building and supportive policies focused on use and conservation.

Dr. Nora Castaneda outlined the BOLDER project's 2024 activities, which commenced with stakeholder meetings in each country to determine priority crops, desired traits, and potential crop improvement strategies. Subsequent activities include gene bank conservation, participatory germplasm evaluations with farmers, and in-depth analyses of value chains and agri-food systems. These interconnected initiatives will inform and support the project's mission to promote nutritious, climate-resilient, and environmentally friendly crops in West and East Africa

The discussion, led by Dr. Nora Castaneda, revolved around the strategic selection of Neglected and Underutilized species (NUS) crops, with a focus on choosing four priority crops per country to maximize impact. These crops will be drawn from six categories: cereals, legumes, fruits, vegetables, root tubers and bananas, and nuts and seeds. Participants were invited to provide feedback via QR codes, suggesting additional NUS crops if necessary. Emphasizing the workshop's participatory nature, Dr. Castaneda assured that all issues would be documented for further action. Additionally, she clarified the Svalbard Global Seed Vault's role as a secure duplication mechanism, where organizations retain control over stored seeds, with National Gene Banks and universities already utilizing this service under the BOLD program, ensuring the preservation of crop diversity

4 Crowd sourced Citizen-science Approach for Participatory Evaluation and Selection

By Mr. Stephen Angudubo – Alliance of Bioversity International and CIAT

This innovative method involves engaging numerous farmers in data collection through small-scale experiments and observations. By leveraging the power of many, this approach enables the testing of crop varieties under local production conditions, understanding end-user preferences, and enhancing variety diffusion among farmers.

The approach utilizes **the Triadic Comparison of Technologies (TRICOT)** methodology, where farmers and end-users act as citizen scientists, observing and experimenting with three technologies each. This data is then analysed using **ClimMob statistical** models to identify top-performing technologies. The benefits of this approach extend to informing adoption, sales, genetic gain, breeding priorities, and product profiles.

Key lessons learned from this approach highlight the importance of co-ownership for success, with ongoing efforts to enhance ownership and expand beyond ranking. Plans focus on Neglected and Underutilized Species (NUS) crops, including capacity building for professionals, developing crop-specific protocols, continuing software development, and establishing new partnerships across crops.

During the Q&A session, concerns about data privacy on the ClimMob platform were addressed by Stephen Angudubo. He assured that project users maintain control over their data, with technical support accessible only upon explicit permission in case of issues. Stephen also revealed ongoing efforts to establish data sharing protocols, ensuring robust security measures. Additionally, he highlighted the platform's growing adoption by breeding programs and invited interested parties to explore the ClimMob website and YouTube channel for further information, demonstrating the platform's credibility and potential for facilitating collaborative crop research.

5 Existing NUS projects and Programmes in Tanzania

5.1 NUS conservation and Utilization in Tanzania

By Dr. William Hamisy - TPHPA-NPGRC

Dr. William Hamisy from TPHPA-NPGRC highlighted Tanzania's rich plant diversity, comprising approximately 10,000 species utilized for food, fodder, medicine, and crop improvement. Despite research and policies focusing primarily on major crops, traditional communities continue to cultivate Neglected and Underutilized Species (NUS). The National

Plant Genetic Resources Centre (NPGRC), established in 1991, aims to promote conservation. To date, NPGRC has collected and conserved around 10,000 accessions, with 67% being NUS or crop wild relatives. Of these, 2,237 accessions have been characterized and 2,824 distributed to researchers and breeders.

Dr. William Hamisy, highlighted past projects hosted by NPGRC which have significantly contributed to NUS conservation, including initiatives on underutilized vegetables, BAMLINK, on-farm conservation of priority NUCs in Southern Tanzania, and seed diversity conservation under the CSBs in Karatu. The centre has also promoted on-farm conservation through farmer-led seed systems and organized seed fairs in collaboration with stakeholders. Dr. Hamisy emphasized that Tanzania's diverse plant species are vital for local communities, contributing to nutrition and climate change adaptation. These efforts underscore the importance of preserving and utilizing NUS to ensure food security and sustainable agricultural practices.

The presentation sparked lively discussion, with participants raising concerns and questions. These included the omission of dioscorea yam species, a crucial Neglected and Underutilized Species (NUS), and whether the 2004 baseline survey captured reasons for farmers' neglect of NUS crops. Additionally, attendees inquired about conservation standards for wild fruits, vital for wildlife, and the consideration of farmers' traditional knowledge regarding indigenous varieties. Dr. William Hamisy addressed these concerns, noting that some farmers acknowledged the availability of NUS varieties, albeit grown by few individuals. He emphasized the need for *in-situ* forest protection, citing environmental degradation and the adaptive capacity of plants. Acknowledging the survey's outdatedness, Dr. Hamisy recognized that NUS classification may have changed over 20 years. He assured that farmers' indigenous knowledge is integral to conservation efforts and efforts are underway to integrate this knowledge into practices.

5.2 The status of NUS breeding in Southeastern Tanzania

By Dr. John Jasper Tenga – TARI Mtwara

The Tanzania Agricultural Research Institute (TARI), established in 2016, aims to strengthen agricultural research nationwide, with a mandate to conduct, regulate, promote, and coordinate research activities. TARI's nine research centers and eight sub-centers, strategically located across agro-ecological zones, focus on various crops. At TARI Naliendele, research priorities include cashew, sesame, groundnuts, Bambara groundnuts, and finger millet.

Through collaborative research, TARI Naliendele has made significant strides in NUS breeding, releasing six Bambara groundnut and three finger millet varieties. Additionally, 59 germplasm lines are being maintained and evaluated for desirable traits. Partnerships with SwissAid have facilitated the collection of local Bambara groundnut (20) and finger millet (23) varieties, establishment of Mother and Baby trials, and participatory variety selection. Moving forward, TARI plans to expand its research activities to other NUS crops. Dr. Tenga expressed gratitude to SwissAid for financial support and acknowledged the vital role of Local Government Authorities and farmers in the research process.

The discussion delved into the nutritional attributes of NUS and their preservation during breeding. Dr. John Jasper Tenga clarified that Bambara groundnuts, rich in proteins, fats, and amino acids, and finger millet, abundant in carbohydrates and iron, collectively provide a balanced diet. He assured participants that breeders prioritize maintaining these nutritional values during the breeding process. Furthermore, Dr. Tenga emphasized the importance of community involvement, explaining that seeds are returned to the original farmer communities or collectors, ensuring the preservation of genetic diversity and cultural heritage.

5.3 Mainstreaming African traditional vegetables into national agrifood systems in sub-Saharan Africa

By Dr. Soningbe N'Danikou – World Vegetable Center

With over 1,000 vegetable species globally, efforts are needed to promote conservation, utilization, and policy support. A key recommendation is investing in Gene Bank infrastructure, as currently, only one sub-Saharan African country has a functioning Gene Bank, conserving merely 62% of selected African vegetables.

To address this, the World Vegetable Center has developed a rescue plan for African vegetable biodiversity. This plan involves rescuing and conserving vegetable diversity, developing integrated seed systems, conducting innovative research, networking, enhancing human resource capacity, and raising awareness. WorldVeg Tanzania serves as

Africa's vegetable Gene Bank, housing over 6,000 accessions and distributing 3,687 seed samples to researchers, breeders, and farmers through seed kits and seed samples over the past decade.

Utilizing the TRICOT approach, WorldVeg collaborates with farmers to identify preferred traits, guiding breeders in developing tailored materials. Successful school programs and ongoing research on five NUS crops across four countries further support this initiative. To enhance traditional vegetable production and consumption, Dr. N'Danikou recommended creating an enabling environment through policy formulation, leveraging African vegetable germplasm in R&D programs, and adopting a market-oriented approach.

The discussion centered on the complexities of farmer seed registration and commercialization in Tanzania, particularly in relation to the Seed Act. Dr. Soningbe N'Danikou highlighted that the Act does not recognize local seed varieties, restricting farmers from commercializing their produce, despite being allowed to grow them. To commercialize, farmers must undergo a certification process. Notably, two farmers have attempted registration, with one successful case and another pending. The Tanzania Official Seed Certification Institute (TOSCI) has established procedures for registering farmer seeds to prevent adulterated products in the market. Participants were encouraged to collaborate with TOSCI to facilitate farmer seed registration, bridging the gap between local seed production and formal commercialization.

5.4 Neglected and Underutilized Crops (NUC) and Community seedbanks

By Ms. Gladness Brush Martin – SWISSAID Tanzania

The Consumption of Resilient Orphaned crops and Products for Healthier Diets (CROPS4HD) project aims to enhance rural communities' livelihoods, food security, and nutrition through sustainable NUC utilization, conservation, agro-ecological practices, and climate change adaptation. SWISSAID collaborates with partners, including TARI, TAVIO, and WorldVeg, to integrate 14 identified NUS species into farming systems using PUSH (training farmers, research) and PULL (market linkages) approaches.

These NUS species, rich in micronutrients like iron, zinc, and vitamin A, have significant potential to contribute to Tanzania's national food system. Notable achievements include raising awareness about Bambara beans, developing 12 innovative NUS-based food products, creating NUS profiles and cookbooks, and promoting research activities. Key lessons learned emphasize investing in research, policy, and innovation for resilient and sustainable food systems.

SWISSAID has established 11 farmer-led Community Seed Banks (CSBs), each with a management committee, seed exchange mechanism, quality control, and cost-sharing arrangements. Despite challenges like limited resources, low seed volume, and market constraints, CSBs require financial, technical, and material support, including linkages to National Gene Banks. Gladness concluded by stressing the importance of conserving agrobiodiversity through informed food choices, strengthening farm-level resilience, and promoting NUS conservation.

The discussion centred on Community Seed Banks (CSBs) and related policies, with a participant highlighting the practicality of seed demonstration plots over storage buildings. Gladness Brush Martin from SWISSAID Tanzania shared lessons learned, noting that offering free space can hinder CSB independence. Instead, their model provides free training on establishing CSBs, empowering farmers to initiate the process with minimal resources and shared responsibilities. Regarding farmer seed registration, Gladness announced an upcoming protocol developed in collaboration with TOSCI and TARI. Additionally, SWISSAID plans to conduct a seed diversity assessment to understand available seed diversity and quantity, informing a sustainability plan. The role of media in disseminating vital information to farmers was also acknowledged, underscoring the importance of multi-faceted support for CSBs.

6 Stakeholder Mapping

The stakeholder mapping exercise involved three main steps:

i. First the workshop participants were classified into different categories based on the NUS food and seed system functions covered in Table 2. below.

Table 2. NUS food and seed system functions and stakeholder categories

NUS FOOD AND SEED SYSTEM FUNCTIONS	STAKEHOLDER CATEGORIES AND THEIR ROLES
NUS BIODIVERSITY USE AND MANAGEMENT CONSERVATION RESEARCH AND BREEDING SEED SYSTEMS CROP PRODUCTION **NUS FOOD SYSTEMS** VALUE ADDITION & PROCESSING MARKETING CONSUMPTION **CROSS CUTTING** KNOWLEDGE VALIDATION, POLICY FORMULATION AND IMPLEMENTATION CAPACITY DEVELOPMENT COMMUNICATION	**Farmers and local communities** – are primary custodians of NUS and conserve them in-situ and on-farm **Genebanks** – conserve NUS ex-situ **Researchers and breeders** – evaluation, breeding and development of new technologies and innovation they also provide scientific knowledge **Private sector including restaurants and chefs**– invest in value chains and market development, seed sector **Non-Governmental organizations** – capacity development, value addition, policy advocacy, consumer awareness **Knowledge management organizations, Government agencies** – formulate policies, laws and regulations and provide funding **Media** – consumer awareness and knowledge dissemination

The end-result was 5 main groups classified as below

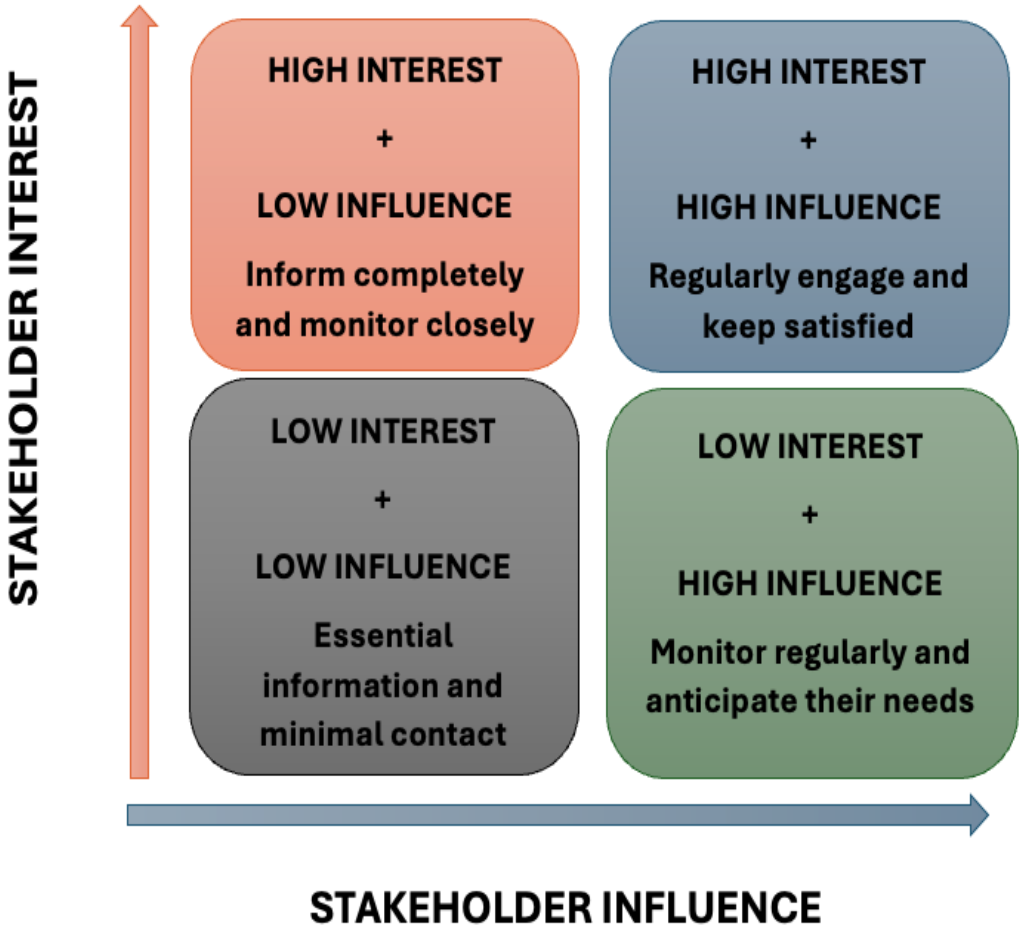
Stakeholder groups and facilitators

1. NUS biodiversity uses and management - farmers and local communities (Gloria Otieno - ABC and N'Danikou Sognigbé - WorldVeg)
2. NUS biodiversity uses and management – Gene Banks, researchers, breeders and seed sector (Olaniyi Oyatomi - IITA and Abdul Shango - WorldVeg)
3. NUS food systems - human health and nutrition + NGOs (Daudi Mubiru - ABC, Nora Castaneda – Crop Trust)
4. NUS food systems - private sector (value addition, marketing, consumption) (Juana Thimnu – Crop Trust, Anastasia Wahome - ABC)

5. Cross-cutting: policy formulation and implementations, capacity development, communication + NGOs (Stephen Angudubo - ABC and William Hamisy - TPHPA)

ii. The stakeholders were then asked to work in their groups to identify other stakeholders that they work with and summarize them in a table based on the above-mentioned categories and functions. See the stakeholder mapping table template in Annex 3.

iii. Using a flip chart, **participants** classified stakeholders according to the interest and capacity to influence using the following matrix:



All the stakeholders listed in the 'high interest' and 'high influence' categories are then listed separately with their contact information as these are the stakeholders that are critical for the success of the project.

6.1 Stakeholder Mapping: The Human Health and Nutrition Group

The Human Health and Nutrition stakeholder mapping identified a diverse array of organizations, each playing a vital role in promoting nutrition and health outcomes in Tanzania. **Private sector entities**, including Tanya Company, Three Sisters, TAHA, SIDO, Camartec, and Intermech, contribute significantly to food processing, production, and capacity building landscape. Specifically, they process nutrient-dense foods, produce and export horticultural produce, fabricate food processing machines, and build capacity for local entrepreneurs.

Non-Governmental Organizations (NGOs) such as Catholic Relief Services, Rikolto, Recoda, Counsenuth, CARE, Kolping Society of Tanzania, GAIN, and WFP prioritize farmer capacity building, community mobilization, seed system support, nutrition advocacy, and emergency food assistance. These NGOs work tirelessly to enhance farmers' skills, promote community-led initiatives, develop robust seed systems, advocate for nutrition policies, and provide critical food assistance during emergencies.

National research organizations – TARI, TFNC, CGIAR CIAT, IITA, and CIP – drive research, breeding, and capacity building in biofortification and seed systems. Their groundbreaking work focuses on developing nutrient-rich crop varieties, improving seed quality, and strengthening farmer field schools. Additionally, they conduct critical research on nutrition and health, enforce regulatory standards, and promote nutritional materials.

Universities, including SUA, NM-AIST, MUHAS, UDOM, and UDSM, provide critical training, research, and consultancy services. They offer specialized training programs in nutrition, public health, and value addition, fostering innovation and capacity building. Furthermore, these institutions conduct pivotal research, provide consultancy services, and engage in policy analysis and advocacy.

Consumer groups, comprising Under 5 years groups and Women of Reproductive Age, address nutritional assessment, feeding practices, and women's empowerment. These groups focus on improving nutrition outcomes for vulnerable populations, promoting optimal feeding practices, and enhancing women's roles in food production and processing.

Government agencies, notably the Ministry of Health (MOA) and Local Government, play a crucial role in formulating policies, enforcing regulations, and monitoring nutrition programs. They develop national strategies, guidelines, and standards, ensuring a coordinated approach to nutrition and health.

Lastly, National Food Reserve Agents ensure food security during emergencies by storing and distributing food, planning emergency responses, and maintaining food reserves.

For a comprehensive overview of stakeholders and their specific roles as mapped by the Human Health and Nutrition Group, please refer to the detailed table in the Annex 4 section.

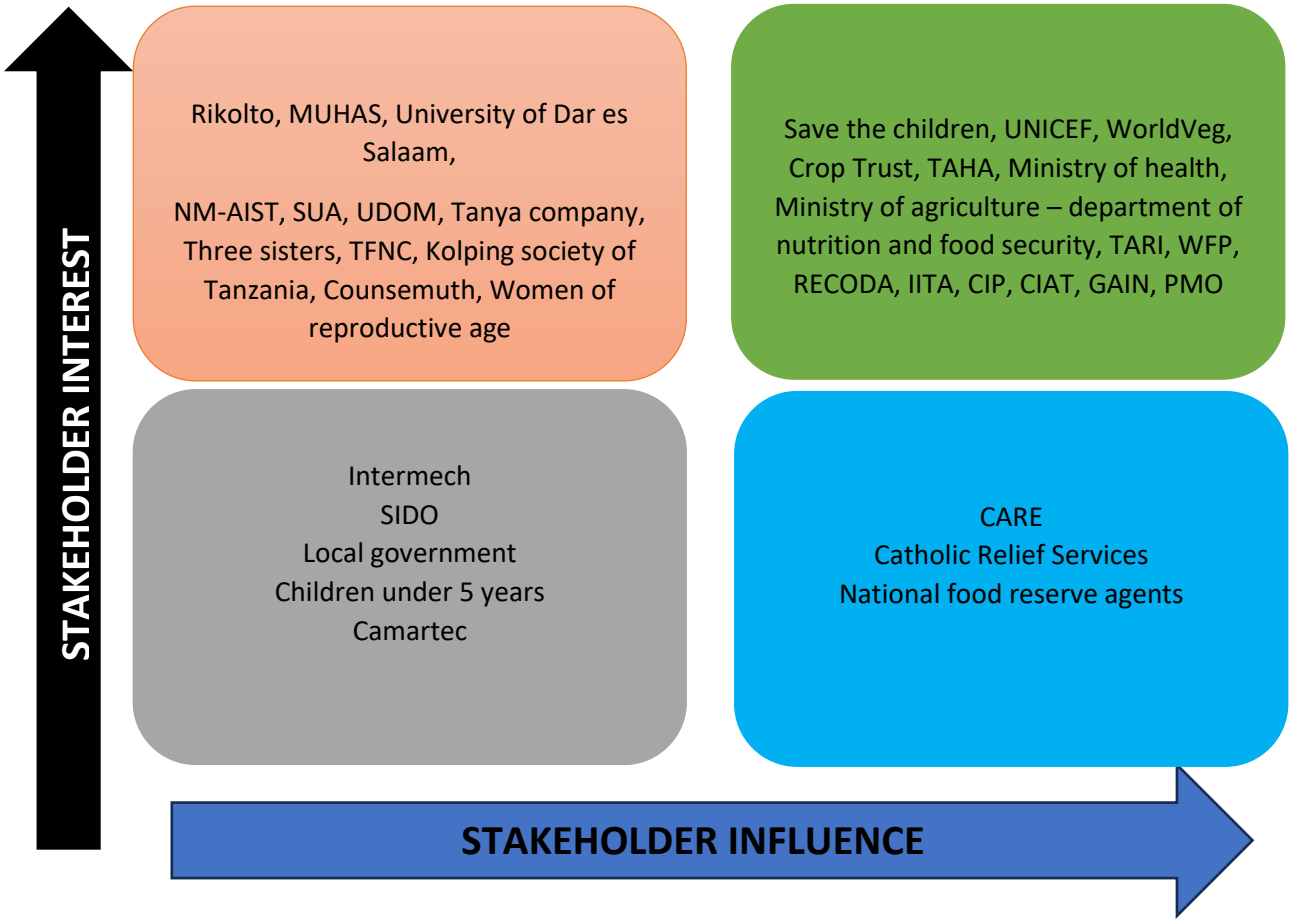


Figure 1. Influence Vs. Interest Chart for the Human Health and Nutrition Group

6.2 Stakeholder Mapping : Gene banks, researchers, breeders and seed sector Actors

Gene Banks, Breeders, and Researchers identified several organizations they collaborate with conserve, conduct research, and development of Plant Genetic Resources. This collective effort aims to preserve crop diversity, improve agricultural productivity, and ensure food security.

Private sector entities, including the Tanzanian Seed Trade Association (TASTA) and the Tanzania Horticultural Association (TAHA), coordinate the seed trade and horticultural crop sectors, facilitating the distribution of high-quality seeds, promoting best practices, and advocating for industry development**. Producer organizations** like the Agricultural Seed Agency (ASA) focus on seed production, multiplication, and distribution, ensuring the availability of quality seeds for farmers.

Non-Governmental Organizations (NGOs) such as the IDP, World Vegetable Center (WorldVeg), ECHO, PELUM, and SWISSAID prioritize community-led initiatives. These initiatives include establishing Community Seed Banks to preserve local crop diversity, promoting on-farm conservation to protect Genetic Resources, and conserving seeds through seed banking. Additionally, PELUM promotes the use of NUS to enhance crop diversity and resilience.

National research organizations, comprising the Tanzanian Agricultural Research Institute (TARI), The Alliance of Bioversity International and CIAT (ABC), International Maize and Wheat Improvement Center (CIMMYT), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), and International Institute of Tropical Agriculture (IITA),

drive research and conservation efforts. They develop climate-resilient and disease-resistant crop varieties, conserve Genetic Resources, and build capacity for farmers.

Universities, including Muhimbili University of Health and Allied Sciences (MUHAS), Sokoine University of Agriculture (SUA), Nelson Mandela African Institution of Science and Technology (NM-AIST), University of Dodoma (UDOM), University of Dar es Salaam (UDSM), and Mbarara University of Science and Technology (MUST), provide critical research, training, and capacity building. They advance crop science, genetics, and breeding research, develop skilled professionals, and enhance institutional capacity.

Consumer groups, comprising Tanzania Breweries Limited (TBL), Serena Breweries Limited (SBL), AZAM, and MeTL, engage in food processing and crop utilization. They create value-added products, promoting efficient use of Genetic Resources.

Government agencies, notably the Agricultural Seed Agency (ASA), Tanzanian Agricultural Research Institute (TARI), Tanzania Plant Health and Pesticides Authority (TPHPA), and Tanzania Official Seed Certification Institute (TOSCI), regulate and oversee research, conservation, and management of Genetic Resources. They guide scientific inquiry, protect Genetic Resources, and ensure effective use.

Furthermore, institutions like ECHO, Tanzania National Parks (TANAPA), Tanzania Wildlife Authority (TAWA), Tanzania Wildlife Research Institute (TAWIRI), Tanzania Forest Research Institute (TAFORI), Tanzania Forest Service (TFS), and TPHPA conserve and conduct research on Plant Genetic Resources. They preserve seeds, plants, and tissues through *ex situ* conservation, protect Genetic Resources in natural habitats through *in situ* conservation, and advance understanding of Genetic Resources through research.

For a detailed Stakeholder Mapping Matrix for the Gene bank, Breeders and Researchers Group, refer to a detailed Table in Annex 6. Below.

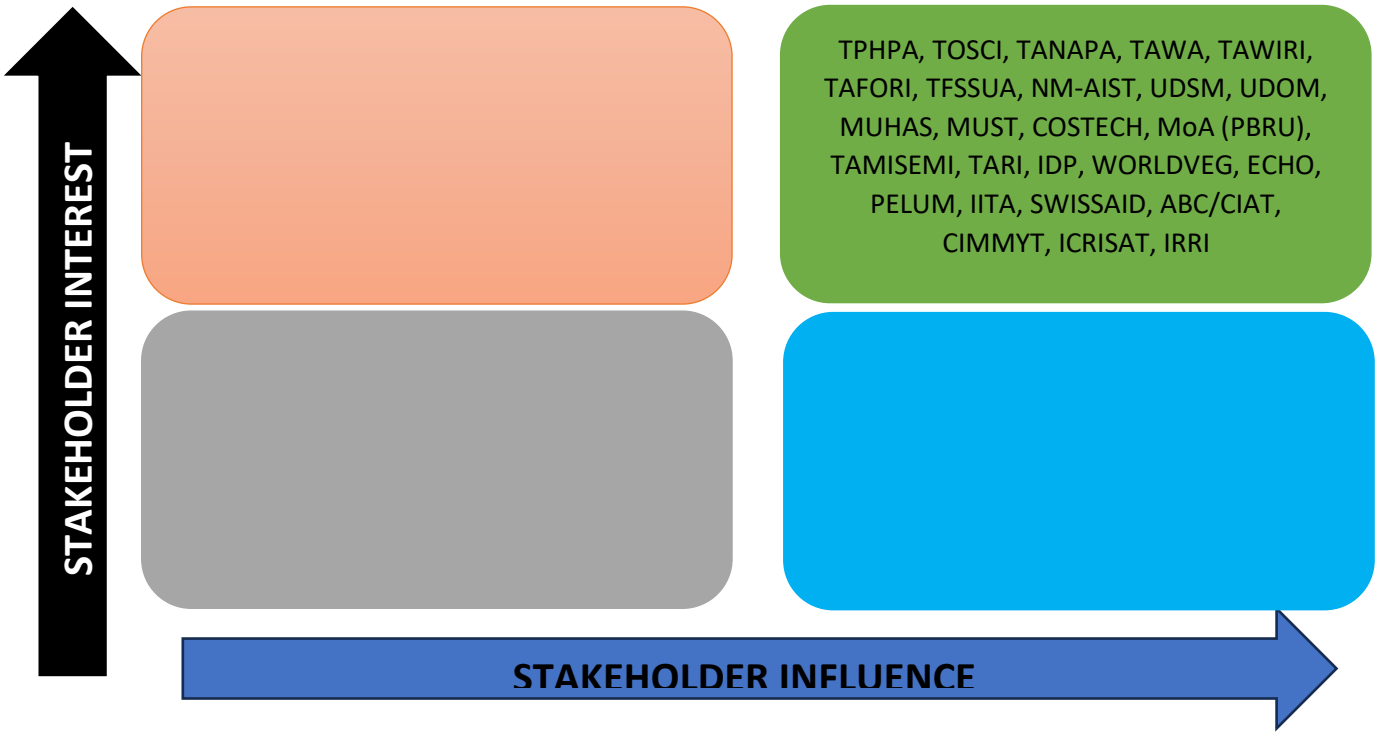


Figure 2. Influence Vs. Interest Chart for Gene banks, breeders and Researchers Group

6.3 Stakeholder Mapping: Private sector actors

The private sector plays a pivotal role in promoting sustainable agriculture and robust seed systems in Tanzania, with various stakeholders contributing to this endeavour. Organizations like Caritas Tanzania and other Dioceses are at the forefront of organic farming, indigenous seed promotion, and seed bank development, enhancing crop diversity and resilience. TASTA serves as a vital link between government and private seed services, facilitating collaboration and coordination. Eco and Organic Co. Ltd specializes in seed production, supply, import, and export, ensuring the availability of high-quality seeds.

The Tanzania Horticultural Association (TAHA) advocates for the growth of horticultural products, promoting sector development and expansion. **Producer organizations**, including Seed Co, ZAM Seed, KIBO Seed, BAYER, ADVANTA, and WESTERN SEED, operate as seed producers and suppliers, providing essential inputs for farmers. These organizations contribute significantly to the country's seed sector, enhancing food security and agricultural productivity.

Non-Governmental Organizations (NGOs) like Mkulima Mbunifu create awareness on best agricultural practices, publish informative materials, and offer farmer advisories, empowering farmers with critical knowledge. Semi Cao, ECHO, and MVIWA Arusha provide additional farmer advisories, while SAT promotes organic farming and training, enhancing farmers' skills. EAIS supplies seed and organic farming inputs, and TOAM promotes organic farming certification, ensuring environmental sustainability.

Research institutions, including the Tanzanian Agricultural Research Institute (TARI) and International Institute of Tropical Agriculture (IITA), drive agricultural research and seed production, developing climate-resilient crop varieties. **Universities** like Sokoine University of Agriculture (SUA) offer agricultural education, training, and seed production, cultivating the next generation of agricultural professionals.

Consumer groups, comprising farmer groups, benefit directly from these initiatives, accessing improved seeds, training, and advisory services. **Government agencies**, such as the Ministry of Agriculture (MoA), District Officers, Extension officers, and Agricultural Seed Agency (ASA), provide critical services, including farmer advisories, regulation, policy development, training, and seed production and supply. TARI also conducts agricultural research and produces seeds, further supporting the sector.

For a comprehensive overview of stakeholders and their specific roles, please refer to the detailed table in the Annex 8 section.

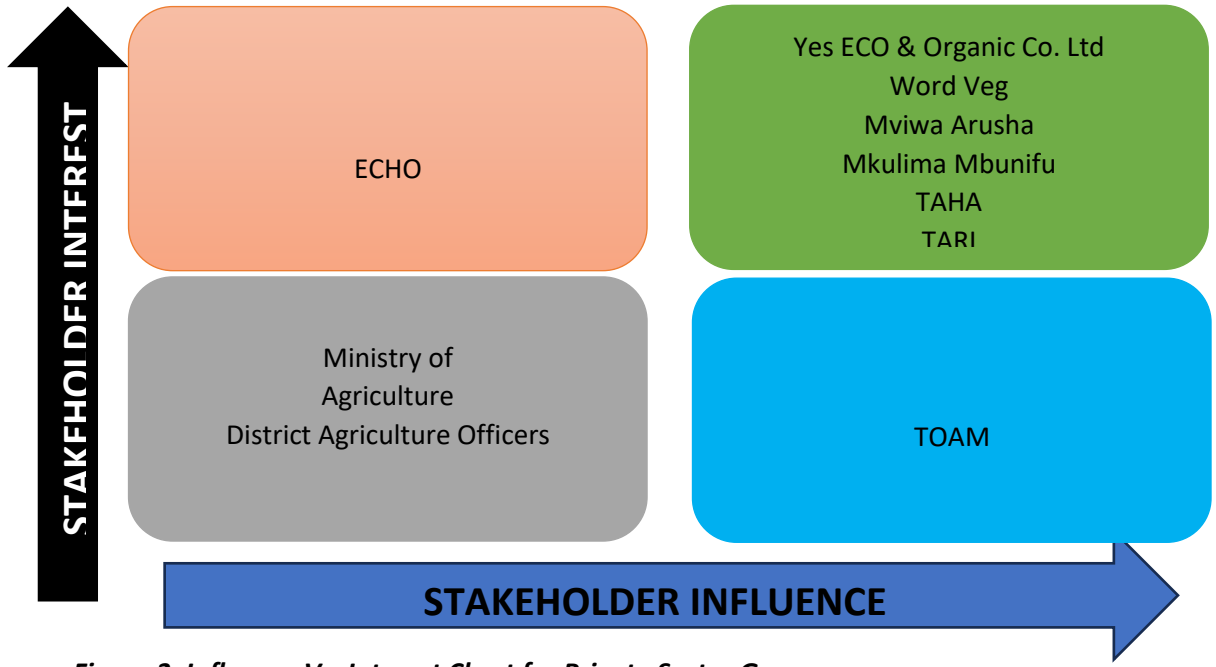


Figure 3. Influence Vs. Interest Chart for Private Sector Group

6.4 Stakeholder Mapping: Cross-cutting Group

The Cross-cutting stakeholder group plays a vital role in promoting sustainable agriculture, robust seed systems, and agroecological practices in Tanzania. **Private sector** entities, including, MESULA organic shop, IAM Organic shop, SAT Holistic group, Biofertilizer enterprises, Chanzi, E-Market M-KILIMO, Muzele Restaurant, Finedrop Restaurant and seed companies dealing in Neglected and Underutilized Species (NUS) seeds, contribute significantly to the sector. They are involved in roles such as: trading organic produce, training farmers on organic farming, and operating restaurants serving Neglected and Underutilized Species (NUS) food products. Others trade organic inputs and produce, support out-growers in spice production, market spices for export, supply NUS seeds, provide agronomic advice, and produce biofertilizers. Additionally, some process waste into animal feeds and fertilizers, link farmers with buyers through digital platforms, and sell NUS food products, ultimately enhancing the organic and NUS value chain.

Producer organizations, such as SHIWAKUTA (Tanzania National Farmers Federation), MVIWA Farmers Association, and Tanganyika Farmers Association (TFA), serve as crucial links between farmer associations, protecting farmers' rights, providing training, and advocating for government programs that benefit farmers. These organizations also facilitate market linkages, support small-scale entrepreneurs, and promote informal seed sales and exchange.

Non-Governmental Organizations (NGOs)/Civil Society Organizations (CSOs) – including TABIO, PELUM-Tanzania, ENVIRO-CARE, Sustainable Agriculture Tanzania, IDP, SWISSAID, MVIWATA, ANSA, ESSAF, ECHO, and Mukulima Mbunifa – prioritize advocacy, training, crop research, environmental conservation, seed policy, and nutrition. They promote sustainable agriculture practices, support Community Seed Banks, and enhance farmers' capacity to adapt to climate change.

National Research Organizations, comprising TARI, TAFORI, NPGRC, TALIRI, and **CGIARs** like the Alliance of Bioversity International and CIAT, WorldVeg, IITA, ICRAF, and CIMMYT, drive research and dissemination of cutting-edge technologies, innovations, and management practices. Their work focuses on crop improvement, conservation of Genetic Resources, and development of climate-resilient crop varieties.

Universities, including Sokoine University of Agriculture (SUA), University of Dar es Salaam, and Nelson Mandela African Institution of Science and Technology (NMU), provide comprehensive agricultural education, training, research on NUS, seed production, outreach, and incubation hubs. These institutions cultivate the next generation of agricultural professionals and support innovation in the sector.

Government agencies, such as TOSCI, Agriculture Seed Agency (ASA), TPHPA, and Local Government agencies, regulate seed business, ensure quality assurance, provide farmer advisory services, and conduct plant health and quality control. They enforce regulatory standards, support seed certification, and promote environmentally friendly farming practices.

For a comprehensive overview of stakeholders and their specific roles, please refer to the detailed table in the Annex 10 section.

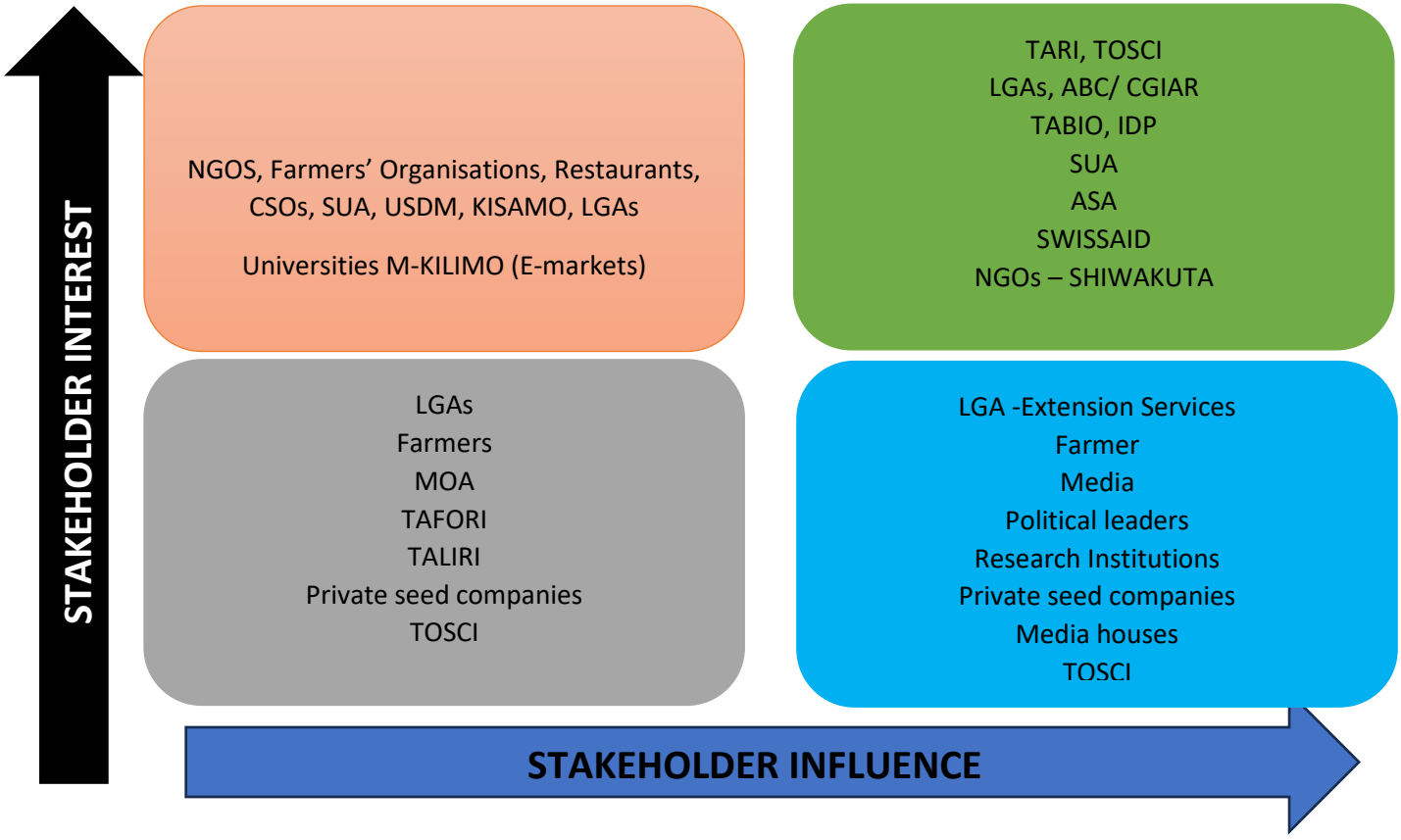


Figure 4. Influence Vs. Interest Chart for the Cross-cutting Group

6.5 Stakeholder Mapping: Farmers and Local Communities' Group

The Farmers and Local Communities' group collaborates with stakeholders dedicated to advancing sustainable agriculture and enhancing livelihoods in Tanzania. **Private sector** entities, including TBL, I Am Organic, Hatari Lodge, TAHA Fresh, KIBO Seeds, SAT Holistic, EA Seed, VEG Seed, and East West Seed, play a crucial role in promoting sustainable agriculture practices. They engage in contract farming, purchase products directly from farmers, sell vegetable seeds, and produce seeds for local conservation and exchange, thereby supporting local economic development.

Producer Organizations, such as Farmer Organizations, SHIWAKUTA, ESAFF, and MVIWAARUSHA, serve as vital links between farmers, markets, and policy makers. They focus on advocacy, capacity building, seed conservation, value addition, and market linkages, empowering farmers to improve their productivity and income.

Non-Governmental Organizations (NGOs) – including SWISSAID, IDP, TABIO, NORGES VEL, PELUM, ENVIROCARE, RIKOLTO, RECODA, WE EFFECT, SJS, SAT, WODSTA, TOAM, FLORESTA, FARM RADIO, MC DONALD, Action Aid, INADES, TAHA, TRIAS, Slow Food, and CARITAS – provide essential support to farmers and local communities. They offer capacity building, advocacy, knowledge management, financing, resource mobilization, consumer awareness, and support for value addition, enhancing farmers' resilience and competitiveness.

National Research Organizations, comprising TARI**, CGIARs** like WorldVeg, FIBL, ABC, ILRI, Africa Rice, IITA, and African Biodiversity Network, drive cutting-edge research, innovations, and policy formulation. These institutions develop and disseminate climate-resilient crop varieties, improve agricultural productivity, and inform policy decisions.

Universities contribute to breeding, dissemination of knowledge, and capacity building, cultivating the next generation of agricultural professionals and innovators.

Government Agencies, including TOSCI, ASA, NPGRC, TPHPA, MOA, TBS, and LGAs, regulate, conserve, and ensure quality assurance of agricultural products and Genetic Resources. They enforce regulatory standards, support seed certification, and promote environmentally friendly farming practices.

For a comprehensive overview of stakeholders and their specific roles, please refer to the detailed table in the Annex 12 section.

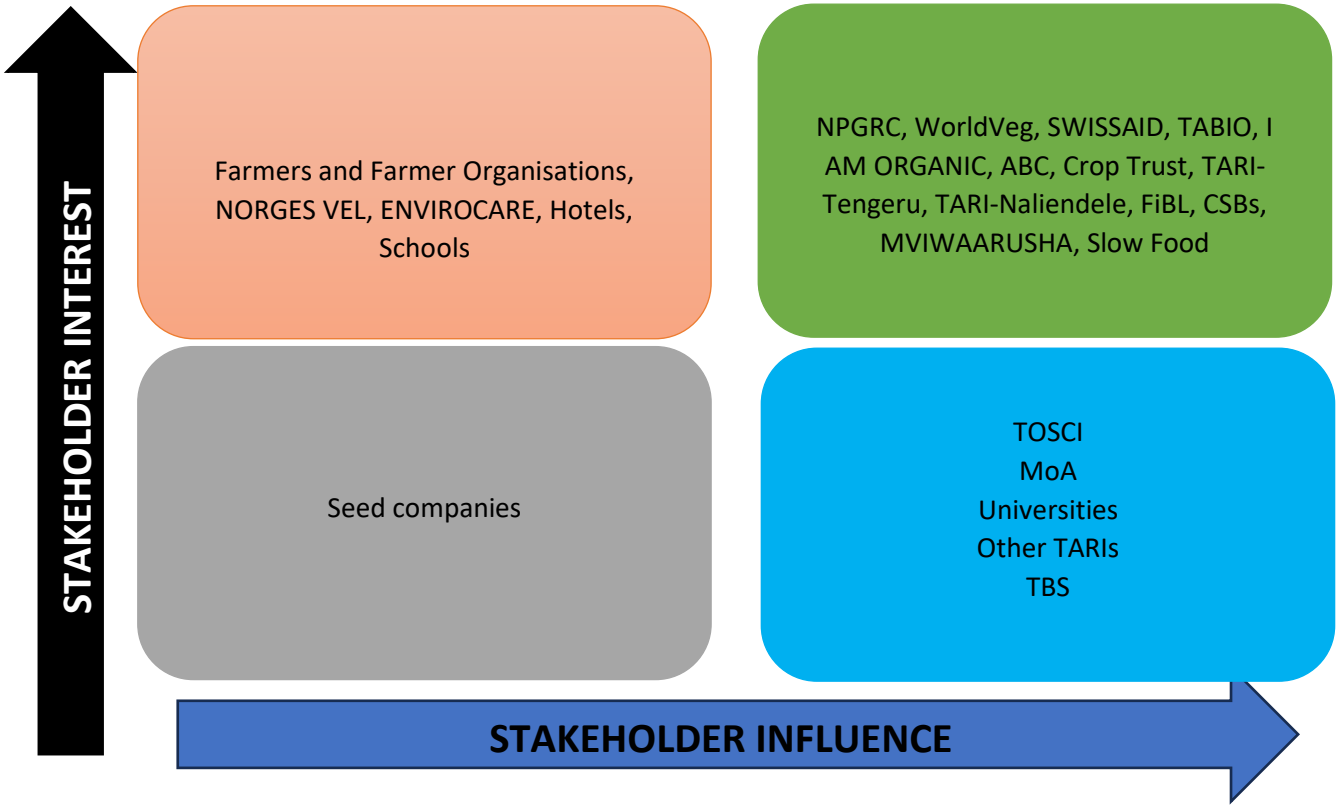


Figure 5. Influence Vs Interest Chart for Farmers and Local Communities

7 NUS and Trait Prioritization Group Exercise

The second day of the workshop entailed **a NUS prioritization exercise** to determine the four/five NUS crop species of focus within each country and their **prioritized traits**.

The NUS prioritization exercise involved preparing a master list comprising 186 Neglected and Underutilised Crops to guide the crop prioritization exercise with the meeting participants. This list was obtained from the 150 crops identified during Phase 1 of the prioritization exercise of the Vision for Adapted Crops and Soils (VACS) (https://www.state.gov/the-vision-for-adapted-crops-and-soils/), 99 species of the African Orphan Crops Consortium (https://africanorphancrops.org/), 97 species of FAO's compendium of forgotten foods in Africa (https://www.fao.org/family-farming/detail/en/c/1681304/), 50 species prioritized in van Zonneveld et al., 2023 and 21 crops NUS community.

Table 3. Table summarising the crop category and number of crops

Crop Category	*Number of crops*	*Crop Category*	*Number of crops*	*Crop Category*	*Number of crops*
Vegetables	49	Nuts, seeds and oilseeds	19	Legumes	14
Fruits	71	Cereals	14	Roots and tubers	11

Participants engaged in a process to redefine and clarify the concept of "Neglected and Underutilized Species" (NUS), including identifying crops that do not qualify as NUS. They were encouraged to list crops that, by consensus, should not be considered NUS. To guide the discussion, participants considered key questions such as:

- Is this crop widely consumed in the country, but still lacking in research?
- Is there a dedicated breeding or agronomy program in the country focusing on this crop?

These guiding questions helped participants distinguish NUS from other crops and form a clearer, shared understanding of which species align with NUS criteria.

Participants were then tasked with prioritizing selected NUS crops within major crop categories: fruits, vegetables, cereals, roots and tubers, legumes and nuts, and seeds and oilseeds. The crops were selected based on the following criteria:

1. **Climate Adaptability**: Potential to adapt to climate change, including resilience to high temperatures, long dry spells, low precipitation, and arid conditions.
2. **Nutritional Value**: Contribution to improving nutrition and health.
3. **Cultural Acceptance**: The extent to which the crop is part of local diets and traditional food practices.
4. **Local Market Potential**: Opportunities for market expansion and demand growth within the country.

These criteria ensured a comprehensive approach to selecting crops that could sustainably enhance local food systems and contribute to resilience.

7.1 Prioritised NUS and the rationale for their selection

The Tanzania team strategically identified four Neglected and Underutilized Species (NUS) crops as top priorities, recognizing their exceptional resilience, nutritional value, cultural significance, and market potential. These crops hold immense promise for enhancing food security, nutrition, and climate resilience in Tanzania.

Moringa takes the lead, demonstrating remarkable adaptability to dry and hot environments, boasting an impressive nutritional profile rich in protein, vitamins A and C, and high iron levels. Its medicinal properties and significant local market demand for derived products, such as powder and oil, further solidify its position.

Sweet potato ranks second, showcasing resilience during dry periods and thriving in rainy seasons. Its notable nutritional value, including fiber, vitamin A, and essential minerals, complements its social significance in Mwanza, where dried sweet potato serves as a vital food source during shortages.

Finger millet and Bambara groundnut share third and fourth priority, respectively, due to their adaptability to hot environments, impressive nutritional profiles, and robust local market demand. While finger millet's nutritional value is tempered by anti-nutritional factors, processing mitigates these effects, and its social significance in local brew production underscores its importance. Bambara groundnut's adaptability to dry conditions, high protein content, and significance in flour and groundnut production make it an attractive crop. Both finger millet and Bambara groundnut exhibit high local market potential, with demand influenced by seasonal fluctuations and festivals for finger millet. The market demand for these crops is driven by their versatility in various products, including flour, brew, and snacks.

By prioritizing these NUS crops, the Tanzania team aims to leverage their unique strengths to:

- Enhance food security through climate-resilient crops
- Improve nutrition with nutrient-rich food sources
- Boost local economies through robust market demand
- Preserve cultural heritage through traditional crop promotion
- Support sustainable agriculture practices

These prioritized NUS crops offer a transformative opportunity to improve livelihoods, foster resilience, and ensure a food-secure future for Tanzania.

A comprehensive table outlining the prioritized NUS and the justification for their selection is provided in the table in Annex 13

7.2 Trait Prioritization for the Four NUS

Stakeholder groups in Tanzania, including Human Health and Nutrition, Farmers and Local Communities, Cross-cutting, Gene banks, Breeders and Researchers, and Private Sector, prioritized traits for four Neglected and Underutilized Species (NUS) crops: Moringa, Sweet Potatoes, Finger Millet, and Bambara Groundnuts. The goal is to enhance these crops' potential for improved nutrition, food security, climate resilience, and market value.

Key priorities across crops and stakeholder groups included:

- Resistance to pests and diseases
- Drought tolerance and adaptability
- Nutritional value
- Early maturity
- Yield parameters

Specific priorities varied by crop:

- Moringa: oil content, larger leaves, canopy size, and diversified uses
- Sweet Potatoes: high vitamin A quality, biofortified purple varieties, root tuber flesh color, diversified recipes and acceptability
- Finger Millet: low anti-nutrient content, panicle size, seed color, marketability and disease resistance
- Bambara Groundnuts: high yield, remove anti-nutritional factors, fast cooking, marketability and resistance to wilting

Stakeholder-Specific Priorities:

- Human Health and Nutrition Group: focused on nutritional value and nutrient content
- Farmers and Local Communities Group: prioritized food and nutrition security, adaptability and early maturity
- Gene banks, Breeders and Researchers Group: emphasized early maturity, nutrient content and yield traits
- Cross cutting Group: focused on adaptability and yield, pests and disease resistance and early maturity

These priorities reflect the diverse needs and goals of different stakeholders, from improving human health and nutrition to enhancing crop resilience and improved productivity. By understanding these priorities, researchers, policymakers, and stakeholders can develop targeted strategies to improve these NUS crops, enhancing food security, nutrition, and livelihoods for communities in Tanzania.

For detailed information on Trait Prioritization, please refer to the table in the Annex 14

8 Closing remarks

By Dr. Soningbe N'Danikou - WorldVeg

Dr. Soningbe N'Danikou of WorldVeg delivered the closing remarks, expressing heartfelt gratitude to the team for their enthusiastic participation. He confidently declared that the workshop had successfully achieved its objectives, yielding valuable outputs that would significantly contribute to the BOLDER project. Dr. N'Danikou urged the Gene Banks involved in the project to initiate preparations for its commencement. In conclusion, he extended warm wishes to all participants for a safe and pleasant journey back to their respective homes, bringing the productive workshop to a successful close.

By Mr. Mujuni S. Kabululu - TPHPA

In his closing address, Mr. Mujuni S. Kabululu, representing TPHPA and the Government of Tanzania, extended sincere appreciation to the team for their diligent efforts in prioritizing strategic crops, including sweet potatoes, finger millet, Moringa, and Bambara groundnuts. He lauded the BOLDER project as a flagship initiative and expressed optimism regarding future stakeholder engagement. Prior to declaring the workshop's closure, Mr. Kabululu respectfully requested the facilitation team to circulate all presentations among participants, facilitating broader knowledge sharing and project continuity.

9 Annexes

9.1 Annex 1: Workshop Participants

No	Name	Organisation	Email
1	George Muhamba Tryphone	Sokoine University of Agriculture	
2	Gladness Brush Martin	SWISSAID Tanzania	
3	Zahra Said Majili	Sokoine University of Agriculture	
4	Elibaraka Joseph	TPHPA	
5	Joel Meliyo	TARI	
6	Aloyce Kundy	TPHPA - NPGRC	
7	Abdul Shango	WorldVeg	
8	Davie Manongi	TABIO	
9	Shazil K. Metta	Liwale District Council	
10	Benadetha K. Birahi	Liwale District Council	
11	Joyce E. Mosile	MOA	
12	Gloria Otieno	ABC	
13	Richard Masindika	MVIWAARUSHA	
14	Rose Machange	UMAWGU	
15	Sesilia Jeremia	Norges Vel	
16	Adolf G. Saria	TOSCI	
17	Soningbe n'danikou	WorldVeg	
18	Donati Alex senzia	PELUM	
19	Euphrasia Shayo	Envirocare	
20	Anastasia Wahome	ABC	
21	Filemon Elisante	Agro-ecology consultant	
22	Richard Mbunda	UDSM	
23	Pricilla Marimo	ABC	
24	Daudi Mubiru M.	ABC	
25	Stephen Angudubo	ABC	
26	Zakeo Bundala	TPHPA	
27	Regina Kapinga	IITA	
28	Ind Mapenda	TPHPA-NPGRC	
29	Salim A Ngoma	MOA	
30	Menley Kihwele	TARI	
31	Joseph Hella	SUA	
32	Gloria Kapakala	TPHPA - NPGRC	
33	Eutropia V. Tairo		
34	John Tenga	TARI	
35	William Hamisy	TPHPA-NPGRC	
36	Charles Bonaventure	ECHO-EA	
37	Moureen Awori	ABC	
38	Julia de Buyn	WorldVeg	
39	Juana Thimnu	Crop Trust	
40	Emmanuel Laswai	TARI Tengeru	
41	Joseph Adonia	TARI Tengeru	
42	Clara Mollay	NM - AIST	
43	Emmanuel David Katamba	TARI - Tengeru	

44	Oyatomi, Olaniyi	IITA	
45	Titus Theophil	Syova seed	
46	Eliud Letungaa	MVIWAARUSHA	
47	Fr. Deo Mgumia	CARITAS - Dioces of Same	
48	Emmanuel Kasembe	IDP - Tanzania	
49	Andekelile Mwamahonje	TARI-Makutupora	
50	Aminiel Bethel	Norges Vel	
51	Mujuni S. Kabululu	TPHPA	
52	Lazaro Tango	ABC	
53	Emmanuel Kahumba	SUA	
54	Nora Castaneda-Alvarez	Crop Trust	
55	Laurence Mapunda	The National Plant Genetic Resources Center	

9.2 Annex 2: Agenda

DAY 1

Time	Activity	Responsibility
8:00-9:00	**Arrivals, Registration, Introductions**	
9:00 to 9:30 AM	**Welcome Remarks**	Colleta Nduguru – World Vegetable Center Samson Poneja – Ministry of Agriculture Livestock and Fisheries
9:30-9:45 AM	**Workshop Objectives and Agenda**	Gloria Otieno – Alliance of Bioversity International and CIAT (ABC)
9:45-10:30 AM	**BOLDER Initiative project – objectives and components** **Crowd sourced Citizen-science Approach for Participatory Evaluation and Selection**	Nora Castaneda Crop Trust Stephen Angudubo – Alliance of Bioversity International and CIAT
10:30 -10:45AM	Q&A on Bolder project	ALL
10:45-11:15AM	**TEA BREAK**	
11:30-12.45 PM	**Existing Nus projects and Programmes in the country** 1. NUS conservation and Utilization in Tanzania 2. NUS development and breeding: Finger millet and Bambara Nuts 3. Mainstreaming Neglected vegetables into national agrifood systems in sub-Saharan Africa 4. NUS and Community seedbanks: Experiences from SWISSAID	Willy Hamisi - NPGRC Tanzania John Jasper Tenga – TARI Mtwara Tanzania Soningbe N'Danikou – World Vegetable Center – Arusha Tanzania Gladness Brush Martin – SWISSAID Tanzania
12:45 – 13:00	Q&A and Discussions: Administer the online Survey – QR Code; Tanzania survey: https://forms.gle/1vURGxsrvwK6Qcjt7	ALL
13:00-14:00PM	**LUNCH**	
14:00- 14:15PM	Ice breaker – dividing participants into groups Stakeholder mapping - objectives and methodology and instructions for participants	Nora Castaneda/Gloria Otieno

14:15 – 15.00PM	Group exercises to map stakeholders and their functions	All + Organizers
15.00 – 15.30PM	Plenary -session reporting back	ALL
15:30-16:00 PM	Summary day 1 Results of the survey (new crops to be added and the crops perceived as the most important)	Gloria Otieno – Alliance of Bioversity International and CIAT Juana Thimnu
16:00PM	**TEA BREAK AND DEPARTURE**	

DAY 2

8:00-9:00	**Arrivals and registration**	
9:00 to 9:30AM	NUS prioritization – guidelines and methodology (and instructions for participants)	Nora Castaneda /Juana Thimnu– Crop Trust
9:30-10. 45 AM	NUS prioritization exercise – Group work	ALL
10:45-11:15AM	**TEA BREAK**	
11:15-11:12:15PM	Plenary and discussions on NUS prioritization	
13:00-14:00PM	**LUNCH**	
14.00-15.00 PM	Continue trait prioritization Stakeholder Maps (draft) (10 mins) Final List of Prioritized NUS (10 mins)	Gloria Otieno – ABC Nora Castaneda – Crop Trust
15.00 – 16.00PM	Next Steps	Nora Castaneda
4:00PM	**TEA BREAK AND DEPARTURE**	

9.3 Annex 3: Stake holder Mapping template

Stakeholder	Local (Name)	National	Regional organizations and global	Main roles/functions
Private sector				
Producer organizations				
NGOs			SWISSAID, Slow Food	
National Research organizations				
CGIARs			ICRISAT ABC, World Veg, IITA, ICARDA, CIMMYT	
Universities				
Consumer groups				
Government AGENCIES				
Conservation and management of genetic resources				
Policy				

9.4 Annex 4: Stakeholder for the Human Health and Nutrition Group

Stakeholder	Local	National	Regional	International	Main roles/functions
Private sector	Tanya company				Food processors. Rice, cooking oil, nutrient dense flour, noodles
	Three sisters				Process oil
		TAHA			Produce, pack and export horticultural produce
		SIDO			Capacity building of local entrepreneurs, fabrication of food processing machines
		Camartec			Capacity building of local entrepreneurs, fabrication of food processing machines
		Intermech			Capacity building of local entrepreneurs, fabrication of food processing machines
NGOs				Catholic Relief Services	Farmers capacity building, community mobilization, seed system support, resource mobilization
				Rikolto	Farmers capacity building, community mobilization, seed system support, resource mobilization, standards, production, food environment
		Recoda			Seed systems, capacity building, community mobilization, support associations, cooking demonstrations
		Counsenuth			Seed systems, nutritional counselling, community mobilization, value addition
				CARE	Support communications, capacity building, resource mobilization, support farmers associations
			Kolping society of Tanzania		Support communications, capacity building, resource mobilization, support farmers associations, gender equality
				GAIN	Support nutrition, advocacy policy, biofortification, resource mobilization, research, gender equality
				WFP	School feeding program, procurement, community mobilization, food assistance (humanitarian work during crisis)
National research organizations		TARI			Breeding, seed system, farmer field schools, support health and nutrition, seed production, capacity building (biofortification)
		TFNC			Research on nutrition and health, capacity building, enforce regulatory standards on nutrition, dietary guidelines, advocacy and promotion of nutritional materials

Stakeholder	Local	National	Regional	International	Main roles/functions
CGIAR				CIAT	Biofortification (beans), research and development, capacity buidling, funding
				IITA	Biofortification (cassava, banana), support seed systems, research and development, funding, capacity building (laboratories)
				CIP	Biofortification (sweet potato), support seed systems, capacity building, funding
Universities		SUA			Training and research nutrition, value addition, consultancy, innovation
			NM-AIST		Training and research nutrition, value addition, innovation
		MUHAS			Training on public health, capacity building, outreach, consultants
		UDOM			Training on public health, capacity building, outreach, consultants
		UDSM			Political economy, food security, food sovereignity, gender
Consumer groups		Under 5 years groups			Nutritional assessment, feeding interventions, nutrition assessment
		Women of reproductive age			Feeding practices, antenatal and postnatal care, food production and processing, WASH, women empowerment
Government agencies		Ministry of health (MOA)			Policy formulation, enforcing laws and regulations, monitoring and evaluation of nutritional and health programs, planning and budgeting of nutritional activities, national strategy of nutrition, preparation of guidelines, national nutrition survey, national nutritional and health services
		MAO - department of food and nutrition security			Food and nutrition assessment, enforce laws and regulations, formulation and implementation of policies
		Local government			Enforcing laws and regulations, farmers mobilization, budgeting of nutritional programs, monitoring and evaluation, care practices
		National food reserve agents			Support food, emergencies

9.5 Annex 5: Stakeholder Contacts for the Human Health and Nutrition Group

Full name	Email	Organization	Job title	Notes
		Save the children		
Tuzie Edwin	tedwin@unicef.org	UNICEF		
Patrick Codjia	pcodija@unicef.org	UNICEF		
Jackline Mkindi		TAHA		
Nema Joshua		Ministry of health	Unit director (?)	
Kategano		MOA - department of food and nutritional security	Acting director	
Josephine Mganga	jnganga@recoda.or.tz	Recoda		
Deborah Esau	deborah.esau@wfp.org	WFP		
Dr. Bwana Thomas		TARI	Director General	
Joan Msuya	jmsuya@gainhealth.org	GAIN	Senior research associate	
Abigael Mourwa		PMO		
Kwame Hongero		CIP	Seed systems specialist	+255 689 457 461
Julia de Bruyn	julia.debruyn@worldveg.org	WorldVeg	Scientist healthy diets	
Regina Kapinga	r.kapinga@cgiar.org	IITA	Seed systems (other specialties)	
Gloria Otieno	g.otieno@cgiar.org	Alliance of Bioversity International and CIAT	Scientist GR, Seed Systems and Food Security Policy	

9.6 Annex 6: Stakeholder Mapping for the Gene banks, researchers, breeders and seed sector Group

Stakeholder	Local	National	Regional	International	Main roles/functions
Private sector		TASTA			Seed Trade Association coordinating private seed companies
		TAHA			Coordination of the horticultural crops sector
Producer organizations		TARI			Seed multiplication
		ASA			Seed production
NGOs			IDP	IDP	Community seed banks, on-farm conservation
				WorldVeg	Seed banking (Conservation/research)
			ECHO		Seed banking
			PELUM		Use/utilization of NUS, promote ecological land use anagement
				SWISSAID	
National research organizations		TARI			Research/Conservation
				ABC	Research/Conservation
				CIMMYT	Research/Conservation
				ICRISAT	Research/Conservation
				IITA	Research/Conservation
Universities		MUHAS			Research/Training
		SUA			Research/Training
		NM-AIST			Research/Training
		UDOM			Research/Training
		UDSM			Research/Training
		MUST			Research/Training
Consumer groups		TBL			Producer/Processor
		SBL			Producer/Processor
			AZAM		Producer/Processor
			MeTL		Producer/Processor

Stakeholder	Local	National	Regional	International	Main roles/functions
Government agencies		ASA			Regulatory Agency/Research
		TARI			Regulatory Agency/Research
		TPHPA			Regulatory Agency/Research
		TOSCI			Regulatory Agency/Research
Conservation and management of genetic resources			ECHO		PGR Conservation/Research
		TANAPA			PGR Conservation/Research
		TAWA			PGR Conservation/Research
		TAWIRI			PGR Conservation/Research
		TAFORI			PGR Conservation/Research
		TFS			PGR Conservation/Research
		TPHPA			PGR Conservation/Research

9.7 Annex 7: Stakeholder contacts for Genebanks, Breeders and Researchers Group

Full name	Email	Organization	Job title	Notes
Dr. Thomas Bwana	dg@tari.go.tz	Tanzania Agricultural Research Institute (TARI)	Director General (DG)	+255 713 200 652
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Gloria Otieno	g.otieno@cgiar.org	CIAT		
Ayesiga Buberwa	ayesiga.buberwa@tz.ilesdepaix.org	iles de paix (IDP)	Director Tanzania	
Prof. Aloys Mvuma	vc@mustnet.ac.tz	Mbeya University of Science and Technology (MUST)	VC	+255 754 255 085

9.8 Annex 8: Stakeholder Mapping for the Private Sector Actors' Group

Stakeholder	Local	National	Regional and global	Main roles/functions
Private sector		Caritas Tanzania and other Dioceses		Organic farming, Promotion of indigenous seeds, Seed bank development
		TASTA		Link to government and private seed services
		Yes Eco and Organic Co. Ltd		Seed producer, Seed supplier, Import and export
		TAHA		Advocate for growth of horticulture products
Producer organizations		Seed Co		Seed suppliers
		ZAM Seed		Seed producer, Seed supplier
			KIBO Seed	Seed producer, Seed supplier
			BAYER	Seed producer, Seed supplier, Import and export of seeds
		ADVANTA		Seed producer, Seed supplier, Import and export of seeds
			WESTERN SEED	Seed producer, Seed supplier
NGOs	Mkulima Mbunifu	Mkulima Mbunifu		Awareness creation, Publication of agriculture related information
	Semi Cao			
			ECHO	
	MVIWA Arusha			Farmer advisories
		SAT		Organic farming, training
		EAIS		Seed and organic farming inputs
		TOAM		Promoting organic farming, Organic farming Certification
Research organizations		TARI		Agricultural research Seed production

			IITA	
			World Veg	Seed production
Universities		SUA		Agricultural education & training, Seed production
Consumer groups	Farmer groups			
Government Agencies		MoA		Farmer advisory, Regulation, Policy, Training
	District Officers & Extension officers			Farmer advisory services
		ASA		Seed production and supply
		TARI		Agricultural Research, Seed producer
Policy		MOA		Regulation and policy, Training, Farmer advisories
	DAO's office			

9.9 Annex 9: Stakeholder Contacts for the Private Sector Group

Full name	Email	Organization	Job title	Notes
Avith Thophile	avitius@yahoo.com yesgroup.tanzania@gmail.com	Yes ECO & Organic Co. Ltd	Director	0768 852 190
Elica		Mkulima Mbunifu		0716 128 020
		Mviwa Arusha		
Loveness		TAHA		O767 415 227
		TARI		

9.10 Annex 10: Stakeholder Mapping for the Cross-cutting Group

Stakeholder	Local	National	Regional and global	Main roles/functions
Private Sector NB: Adolf Saria, IDP to provide names of seed companies	MESULA organic shop			Trading in organic produce, Training farmer on organic farming
	IAM Organic shop			Operates restaurant for NUS food products, Trading in organic inputs and produce
	SAT Holistic group			Trading organic inputs and produce, Supports out growers in spice production Marketing of spices, including export
	Seed Companies dealing in NUS seeds			Supply NUS seeds Provide agronomic advice on NUS
	Biofertilizer Enterprises			Production and marketing of biofertilizer
	Chanzi			Processing waste into animal feeds and fertilizers
	E-Market M-KILIMO			Link farmers and buyers
	Muzele Restaurant			Sell NUS food products
	Finedrop Restaurant			Sell NUS food products
Producer Organizations		SHIWAKUTA (Tanzania National Farmers Federation		Link up all producer/ farmer association, Protect farmers' rights, Policy and advocacy
			MVIWA Farmers Association	Training of farmers, Advocacy, Support SMES, Informal seed sales and exchange
		Tanganyika Farmers Association (TFA)		Training of farmers, Advocacy for government programs, Selling farm inputs, Market linkage
NGOs/ CSOs		TABIO		Advocacy, Training, Crop research (NUS), Promote environmental-friendly farming practices
			PELUM - Tanzania	Advocacy for land rights, Training, Seed policy and nutrition, Environmental awareness and conservation
		ENVIRO-CARE		Biocultural interventions for environmental conservation, Training, Support community seed banks, Seed policy and nutrition
		Sustainable Agriculture Tanzania		Training, Conserving traditional seeds, Capacity building on agro -ecological practices

Stakeholder	Local	National	Regional and global	Main roles/functions
			IDP	Support local organizations in agroecological practices, Support farmer-managed seed initiatives, Support agri-food value chains, Support promotion, exhibitions and platforms for sharing information on agroecology
			SWISSAID	Support local organizations in agroecological practices, Support farmer-managed seed initiatives, Support agri-food value chains, Support promotion, exhibitions and platforms for sharing information on agroecology
		MVIWATA		Training on community seed banaks
		ANSA		Advocacy and policy dialogue
			ESSAF	Advocacy and policy dialogue
			ECHO	Training, Advocacy, Conservation – Community seed banks
			FARM RADIO	Support communication on seeds, Awareness creation, Training using radio
		Mukulima Mbunifa		Awareness creation through mass media, Training using magazines
National Research Organizations		TARI		Conduct research and dissemination on technologies, innovations and management practices, Seed production (basic and certified)
		TAFORI		Conduct research on forest and edible trees
		NPGRC		Conservation of genetic resources, Training/ capacity building
		TALIRI		Research on animal feeds, Production of feeds
CGIARs			ABC	Research based solutions on agriculture, environment and nutrition
			WorldVeg	Seed production
			IITA	Research on Vision for Adapted Crops and Soils (VACS)
			ICRAF	Research trees, forests and agroforestry landscapes
			CIMMYT	Research on Vision for Adapted Crops and Soils (VACS)
Universities		SUA		Agricultural education & training, Research on NUS, Seed production Outreach, Incubation hubs
		University of Dar es salaam		Policy advocacy, Outreach, Research on policy framework, Capacity building – education and training
		NMU		Crop research on NUS, Seed production, Capacity building, Outreach

Stakeholder	Local	National	Regional and global	Main roles/functions
Government Agencies		TOSCI		Regulation of seed business, Quality assurance, Seed/ variety registration and certification, Training and awareness creation
		Agriculture Seed Agency (ASA)		Farmer advisory services, Seed production and marketing, Support seed out growers (contract farming
		TPHPA		Plant health and quality control, Pest management and control
	Local government agency -Extension			Training and advisory services

9.11 Annex 11: Stakeholder Contacts for the Cross-cutting Group

Full name	Email	Organization	Job title	Notes
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9.12 Annex 12: Stakeholder Mapping for the Farmers and Local Communities Group

Stakeholder	Local	National	Regional	Main roles/functions
Private sector		TBL		Buy products from farmers
		I am Organic		Contract farming
	Hatari Lodge			
	Tourist Hotel			
		TAHA Fresh		Buy and export
			KIBO seeds	Sell vegetable seeds

Stakeholder	Local	National	Regional	Main roles/functions
		SAT Holistic Comp		Capacity building and value addition
			EA seed	
		VEG Seed		
			East West Seed	
Producer Organizations	MVIWAARUSHA			Produce seeds, conserve and exchange local seeds
	Farmer Organizations			Advocacy and capacity building
		SHIWAKUTA		Conserve seed, Value addition
			ESAFF	Advocacy, capacity building, market linkages, value addition (member organisations)
NGOs			SWISSAID	Capacity building,
			IDP	Advocacy
		TABIO		Knowledge management
			NORGES VEL	Support for value addition
			PELUM	Market linkages (input and output)
		ENVIROCARE		
			RIKOLTO	Financing/ Resource mobilisation
		RECODA		Linkage to credit
			WE EFFECT	Consumer awareness
	SJS			R4D
		SAT		
		WODSTA		Consumer awareness
		TOAM		
		FLORESTA		
			FARM RADIO	
		MC DONALD Organic		
			Action Aid	
			INADES	
		TAHA		
			TRIAS	
			Slow Food	

Stakeholder	Local	National	Regional	Main roles/functions
			CARITAS	
National Research Organizations		TARIs		Research and Innovations, Advocacy
		Universities		Breeding, dissemination of knowledge
CGIARs			WorldVeg	
			FIBL	
			ABC	
			ILRI	
			Africa Rice	
			IITA	
			African Biodiversity Network	Research and policy
Government Agencies		TOSCI		Regulations
		ASA		Conservation
		NPGRC		Policy formulation
		TPHPA		
		MOA		Quality assurance
		TBS		Capacity building
Conservation of PGR		NPGRC		Conservation in and ex situ
			WorldVeg	PVS
	CSBs			Pre-breeding
		TARIs		Breeding
Policy		MOA		Policy and Regulations
		Ministry of Environment		
			EALA	
		Parliament		
	LGAs			

9.13 Annex 13: A matrix of prioritised NUS and the rationale for their selection

Prioritized Crops	Climate change adaptability	Nutritional value	Cultural acceptance	Local market potential	Evaluation/All parameters?
Moringa – 1st priority	**Adaptable to dry and hot environments.**	**Protein, vitamin A and C. High iron content (IQ children). Seed can cause diarrhea. Has phytates and tannins. Used as fodder.**	**Medicinal. Grown in the country.**	**Local market demand for products derived from moringa (fresh leaves not sold in the market)**	
Sweet potato – 2nd Priority	**Planted during the rainy season, may survive during the dry season.**	**Yes (fiber, vitamin A -orange fleshed sweet potato-, minerals)**	**Grown in the country (everywhere). Social significance: Mwanza uses dried sweet potato during shortage of food periods.**	**Local market demand, not associate to a specific festival or season.**	**Yes**
Finger millet – 3rd Priority	Doesn't grow in the off-season, grows in hot environments	Known for nutritional value, has anti-nutritional factors (some varieties have tannins - binds iron. Tannins removed through processing)	Grown in the country. Has social significance (local brew). No taboos associated	Strong market demand. Demand based on season and festivals. High value market. Many buyers	**Same level of preference with Bambara groundnuts**
Bambara groundnut – 4th Priority	**Not grown in the off-season. Adaptable to dry and hot environments. Grows under limited water availability.**	**Known for its nutritional value (protein). Some anti-nutritional factors (tannins, removed through processing)**	**Grown in the country. Social significance: flour, groundnuts (various uses).**	**High local market potential.**	**Yes – Same level of preference with finger millet**
Other Crops					

Prioritized Crops	Climate change adaptability	Nutritional value	Cultural acceptance	Local market potential	Evaluation/All parameters?
Jute mallow	**Can be found growing in the wild. Dry season crop**	**Protein, calcium, vitamin A, iron**	**Grown in the country. Medicine against constipation.**	**High market demand in some parts of the country. High seed demand (e.g. 600kg one user contacting WorldVeg's genebank)**	**Yes**
Amaranth grain	**Grown in the off-season.**	**Protein, iron, calcium, zinc, vitamin A, vitamin C, calories, fiber.**	**Grown in the country (everywhere).**	**Strong local market demand.**	**Yes**
Amaranth leave	**Grown in the off-season.**	**Protein, iron, calcium, zinc, vitamin A, vitamin C, calories, fiber. Few species can have anti-nutritional factors (considerable oxalytes content)**	**Grown in the country (everywhere).**	**Strong local market demand.**	**Yes**
African rice	Doesn't grow in the off-season,	Carbohydrates. Low nutritional value	Not common in the country	Unknown	
Sesame	Not grown in the off-season.	Known for nutritional value (iron, zinc, fat, dietary fiber, low cholesterol)	No taboo associated to the crop. Grown in the country. No special social significance associated. Male dominated crop.	High local market potential. Strategic crop for men.	
Cape gooseberry	Grows in high-altitude areas (water available during the off-season)	Rich in vitamin C, minerals	Eaten as kids, mostly known in the mountains	Profitable (known by people from the mountain). Weak local market demand	
Tamarind	Adaptable to climate change (grows in dry areas)	Iron, vitamins	Grown in the country (everywhere).	Strong local demand.	Yes (but Moringa is preferred)
Green grams/Mung bean	Not grown in the off-season.	Iron, proteins	Grown in the country. No special social significance. No taboo associated to the crop.	High local market potential. Demand not based on season or festival	

Prioritized Crops	Climate change adaptability	Nutritional value	Cultural acceptance	Local market potential	Evaluation/All parameters?
Macadamia	Grown off-season (tree). Grows in hot and dry environments	Vitamin C, protein, minerals	Grown in the country. No special social significance. No taboo associated to the crop. Not a local crop	No local market demand (needs promotion)	
Taro	Needs a lot of water	Dietary fiber, iron, vitamins, carbohydrates	Grown in the country. No special significance associated.	Strong local demand.	

9.14 Annex 14: A matrix of prioritized traits of the four priority crops for each stakeholder category

Order of priority/ Rank	Moringa - Preferred Traits				
	Human Health and Nutrition Group	**Farmers and Local Communities**	**Cross-cutting Group**	**Gene banks, Breeders and Researchers Group**	**Private Sector Group**
1st	Resistance to pests and diseases	Early maturity	Oil content	Nutrient content	
2nd	Drought tolerance	Varieties with larger leaves	Adaptability to environment	Early maturity	
3rd	Nutritional value	Nutrition	Quality	Canopy Size	
4th	Widespread availability in the country (Plasticity)	Drought Resistance	Seed yield	Drumstick size	
5th	High yield	Resistance to pests and diseases	Resistance to diseases	Leaf size	
6th	Diversified uses (multipurpose)		Resistance to pests		
Sweet Potatoes - Preferred Traits					
Rank	**Human Health and Nutrition Group**	**Farmers and Local Communities**	**Cross-cutting Group**	**Gene banks, Breeders and Researchers Group**	**Private Sector Group**
1st	Resistance to diseases	High Vit A	Quality	Nutrient content	
2nd	Diversified recipies	Nutrition -	Yield	Insect Disease Resistance	
3rd	Yield	Ease of processing	Resistance to pests	Root tuber flesh colour	
4th	Nutritional value	Drought tolerant	Early maturity	Early maturity	
5th	Biofortify purple varieties		Drought tolerance	Root tuber size	

6th	Acceptability		Resistance to diseases		
Finger Millet - Preferred Traits					
Rank	**Human Health and Nutrition Group**	**Farmers and Local Communities**	**Cross-cutting Group**	**Gene banks, Breeders and Researchers Group**	**Private Sector Group**
1st	Drought tolerance	Varieties with low anti nutrient content	Marketability (MKT)	Early maturity	
2nd	Nutritional value	Early maturity	Quality (QLT)	Insect resistance	
3rd	Resistance to diseases	Nutrition	Yield (YD)	Panicle size	
4th	Acceptability	Drought tolerant	Early maturity (EM)	Nutrient content	
5th	Early maturity		Drought tolerance (DT)	Seed Color	
6th			Disease resistance (RD)		
7th			Pest resistance (RP)		
Bambara Groundnuts - Preferred Traits					
Rank	**Human Health and Nutrition Group**	**Farmers and Local Communities**	**Cross-cutting Group**	**Gene banks, Breeders and Researchers Group**	**Private Sector Group**
1st	High yield	Resistance to diseases	Marketability (MKT)	Nutrient content	
2nd	Nutritional value	Resistance to post harvest pests	Quality (QLT)	Pest and diseases	
3rd	Drought tolerance	Early maturity	Yield (YD)	Early maturity	
4th	Remove anti-nutritional factors	Nutrition content	Early maturity (EM)	Grain yield	
5th	Acceptability	Drought resistance	Drought tolerance (DT)	Fast cooking	
6th		Resistance to wilting			

9.15 Annex 15: The list of crops Participants selected from

Crop group	Common name (English)	Crop group	Common name (English)	Crop group	Common name (English)
Fruits	Bitter-berry	Vegetables	Okra	Nuts, seeds and oilseeds	Vegetable tallow tree
Fruits	Turkey berry	Vegetables	Aibika, Sunset Muskmallow, Sunset Hibiscus	Nuts, seeds and oilseeds	Allanblackia
Fruits	Cooking banana	Vegetables	Onion	Nuts, seeds and oilseeds	Cashew
Fruits	Bananas	Vegetables	Prostrate Pigweed	Nuts, seeds and oilseeds	Groundnut
Fruits	Bananas	Vegetables	Smooth Amaranth, Slim Amaranth	Nuts, seeds and oilseeds	Aizen, Nabedega
Fruits	Indian fig	Vegetables	Spiny Amaranth, Spiny Pigweed	Nuts, seeds and oilseeds	Canarium nut, Ramy nut
Fruits	Prickly pear	Vegetables	Amaranth/Joseph's coat	Nuts, seeds and oilseeds	Safflower
Fruits	Baobab	Vegetables	Slender Amaranth, Green Amaranth	Nuts, seeds and oilseeds	Coconut
Fruits	African pepper	Vegetables	Vine spinach, Ceylon spinach, Malabar spinach	Nuts, seeds and oilseeds	Sickle Senna
Fruits	Pineapple	Vegetables	Blackjack	Nuts, seeds and oilseeds	Cumin
Fruits	Custard Apple	Vegetables	Boscia	Nuts, seeds and oilseeds	Bottle Gourd, Calabash
Fruits	Wild Custard Apple	Vegetables	Ethiopia Mustard	Nuts, seeds and oilseeds	Flax
Fruits	Sugar Apple, Sweetsop	Vegetables	Celosia	Nuts, seeds and oilseeds	Macadamia
Fruits	Breadfruit	Vegetables	Silver spinach	Nuts, seeds and oilseeds	Groundnut tree
Fruits	Jack Tree	Vegetables	Spiderplant	Nuts, seeds and oilseeds	Sesame
Fruits	Balanites	Vegetables	Ivy Gourd, Scarlet Gourd	Nuts, seeds and oilseeds	Shea
Fruits	Papaya	Vegetables	Jute mallow	Nuts, seeds and oilseeds	Chestnut
Fruits	Carissa	Vegetables	Yoruban bologi	Nuts, seeds and oilseeds	Tigernut
Fruits	White sapote	Vegetables	Pumpkin	Nuts, seeds and oilseeds	Chia
Fruits	Carob, locust bean	Vegetables	Pumpkin	Cereals	Love-lies-bleeding
Fruits	African star apple	Vegetables	Gourd species (bottle, luffah, bitter)	Cereals	Red Amaranth, Purple Amaranth, Mexican Grain Amaranth
Fruits	Star apple	Vegetables	Eru	Cereals	Oats
Fruits	Colocynth	Vegetables	African spiderflower	Cereals	Guinea Grass
Fruits	Watermelon	Vegetables	Wild lettuce	Cereals	Pearl Millet
Fruits	Melon	Vegetables	Leucaena	Cereals	Pearl millet
Fruits	Horned Melon	Vegetables	Vegetable sponge	Cereals	Fonio
Fruits	Tree tomato	Vegetables	Balsam apple	Cereals	Finger millet

Fruits	Safou, African plum	Vegetables	Bitter gourd	Cereals	Teff
Fruits	Sweet dattock	Vegetables	Drum stick	Cereals	Barley
Fruits	Dattock	Vegetables	White mulberry	Cereals	African Rice
Fruits	African persimmon	Vegetables	African Eggplant	Cereals	Kodo millet
Fruits	Kei Apple	Vegetables	Glossy nightshade	Cereals	Sorghum
Fruits	Apple-ring acacia	Vegetables	Tomato	Cereals	Little millet
Fruits	Bitter kola	Vegetables	African Eggplant	Roots and tubers (leaves included)	Taro
Fruits	African Mangosteen	Vegetables	African Nightshade	Roots and tubers (leaves included)	Yams
Fruits	Mangosteen	Vegetables	African Nightshade	Roots and tubers (leaves included)	Sweetpotato
Fruits	Roselle	Vegetables	Purslane	Roots and tubers	Enset
Fruits	False yam	Vegetables	Milk thistle	Roots and tubers	Cassava
Fruits	African bush mango	Vegetables	Dandelion	Roots and tubers	Kafir potato
Fruits	Wild bottle gourd	Vegetables	Fluted gourd	Root and tubers	Hausa potato
Fruits	African grape	Vegetables	Flameflower	Roots and tubers (leaves included)	Cocoyam/Elephant ear
Fruits	Mango	Vegetables	Coriander	Roots and tubers (leaves included)	Cocoyams, Arrowroots
Fruits	Noni	Vegetables	Cucumbers	Roots and tubers	Country potato
Fruits	Mobola plum	Vegetables	Pumpkin	Roots and tubers	Ginger
Fruits	Guinea Plum	Vegetables	Bitter leaf		
Fruits	Locust bean	Vegetables	Sweet bitterleaf		
Fruits	Passion Fruit	Vegetables	Bologi (worow)		
Fruits	Avocado	Vegetables	Redflower ragleaf		
Fruits	Cape gooseberry	Vegetables	Snake gourd		
Fruits	Rubber vines	Legumes	Pigeonpea		
Fruits	Nsaban, kabaa	Legumes	Jackbeans		
Fruits	Guava	Legumes	Chickpea		
Fruits	Marula	Legumes	Soybean		

Fruits	Natal orange, monkey orange	Legumes	Kersting's groundnut		
Fruits	African Orange	Legumes	Lablab/Bonavist		
Fruits	Sweet berry	Legumes	Grasspea		
Fruits	Jambolan (Java) plum	Legumes	Lentils		
Fruits	Water berry	Legumes	Lupin		
Fruits	Marama bean	Legumes	Kersting's groundnut		
Fruits	Wild loquat	Legumes	Lima bean		
Fruits	Blueberry	Legumes	Green bean, kidney bean		
Fruits	Wild medlar	Legumes	Peas		
Fruits	Common wild medlar	Legumes	African winged beans		
Fruits	African black plum	Legumes	Sicklepod, Chinese Senna		
Fruits	Sour plum	Legumes	Favabean		
Fruits	Jujube, ber	Legumes	Mung bean, Green gram		
Fruits	Tamarind	Legumes	Bambara Groundnut		
Fruits	Bell pepper	Legumes	Cowpea		
Fruits	Dragon fruit	Legumes	African yambean		
Fruits	Barbados cherry	Legumes	Fenugreek		
Fruits	Golden apple	Legumes	Sunn hemp		