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Market Study and Value Chain Analysis for Sunflower, Sorghum, Onion and Tomato covering Arusha, Dodoma, Kilimanjaro, Manyara, Mara, Shinyanga, Simiyu, and Singida regions in Tanzania.

Final Report
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ABBREVIATIONS AND ACRONYMS

AASS	Annual Agricultural Sample Survey
ACT	Agricultural Council of Tanzania
AfDB	African Development Bank
AFT	Agriculture Fast-Track Fund
AGRA	Alliance for Green Revolution in Africa
AGITF	Agricultural Inputs Trust Fund
AGSTAT	Agricultural Statistics
AMCOS	Agricultural Marketing Cooperative Society
AMDT	Agricultural Markets Development Trust
AMIS	Agricultural Marketing Information System
ANSAF	Agricultural Non-State Actors Forum
ASA	Agricultural Seed Agency
ASDP	Agricultural Strategy Development Plan
ASDS	Agricultural Sector Development Strategy
ASLMs	Agriculture Sector Lead Ministries
ATMIS	Agriculture Trade Management Information System
AVCF	Agriculture Value Chain Financing
AVISA	Accelerated Varietal Improvement and Seed Delivery of Legumes and Cereals in Africa
AVRDC	Africa Vegetable Research and Development Centre
BBT	Building Better Tomorrow
BDS	Business Development Services
BMGF	Bill and Melinda Gates Foundation
BoT	Bank of Tanzania
BRN	Big Results Now
CAMARTEC	Centre for Agricultural Mechanization and Rural Technologies
CBA	Cost Benefit Analysis
CBO	Community Based Organization
CCRO	Certificate of Customary Rights of Occupancy
CDF	Constituency Development Fund
CDI	Clinton Development Initiative
CF	Contract Farming
CFP	Common Farmers' Practice
CGAP	Consultative Group to Assist the Poor
CGE	Computable General Equilibrium
CGIAR	Consultative Group on International Agricultural Research
CGS	Credit Guarantee Scheme
COPRA	Cereals and Other Produces Regulatory Authority
COSTECH	Commission for Science and Technology
CPB	Cereals and Other Produce Board
CPT	Core Project Team
CRDB	Cooperative and Rural Development Bank
CSA	Climate Smart Agriculture
CSB	Corn Soy Blended
CSF	Critical Success Factor
CSO	Civil Society Organization
CSP	Country Strategic Plan
DAICO	District Agriculture, Irrigation and Cooperation Officer
DANIDA	Danish International Development Agency
DC	District Council
DFID	Department for International Development
DRC	Democratic Republic of Congo
DSM	Dar es Salaam

EA	East Africa
EAC	The East African Community
EAFC	East Africa Food Security Council
EAGC	East Africa Grain Council
EFTA	Equity for Tanzania
EGS	Early Generation Seeds
ERPP	Expanding Rice Production Project
ESRF	Economic and Social Research Foundation
EU	European Union
EUR	Euro
FAO	Food and Agriculture Organization
FAOSTAT	Food and Agriculture Organization Statistics
FEWS	Farming Early Warning System
FFA	Farmers’ Federation Agency
FGD	Focus Group Discussion
FO	Farmers Organization
FSDT	Financial Sector Deepening Trust
FSPs	Financial Service Providers
GAP	Good Agronomic Practices
GATL	Ghems African Traders Limited
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ICCE	Institute of Continuing Co-operative Education
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ICT	Information and Communications Technology
IDP	Iles De Parx
I4ID	Innovation for Inclusive Development
IFAD	International Fund for Agricultural Development
IITA	International Institute of Tropical Agriculture
ITC	International Trade Centre
JUWAVITA	Jukwaa la Wakulima Vijijini Tanzania
KII	Key Informant Interview
KYC	Know Your Customer
LGA	Local Government Authority
MAFSC	Ministry of Agriculture Food Security and Cooperatives
MFIs	Microfinance Institutions
MITI	Ministry of Industry, Trade and Investment
MMA	Match Marker Associates Limited
MMFM	Match Maker Fund Management Limited
MoA	Ministry of Agriculture
MOCU	Moshi Co-operative University
MOU	Memorandum of Understanding
MSD	Medical Store Department
MSME	Micro, Small and Medium Enterprise
MT	Metric Tonne(s)
MVIWATA	Mtandao wa Vikundi vya Wakulima Tanzania
NARCO	National Ranching Company
NBC	National Bank of Commerce
NBS	National Bureau of Statistics
NDJFMA	November to April
NEDF	National Entrepreneurship Development Fund
NEEC	National Economic Empowerment Council
NFRA	National Food Reserve Agency
NGO	Non-Governmental Organization

NHIF	National Health Insurance Fund
NIC	National Insurance Cooperation
NMB	National Microfinance Bank
NPHMS	National Post-Harvest Management Strategy
NPLs	Non-performing loans
NSCA	National Sample Census of Agriculture
NSSF	National Social Security Fund
NTB	Non-Tariff Barriers
OPV	Open Pollinated Varieties
PAC	Public Accounts Committee
PASS	Private Agriculture Sector Support
PELUM	Participatory Ecological Land Use Management
P4P	Purchase for Progress
PHLs	Post-Harvest Losses
PHTs	Post-Harvest Management Technologies
PLWDs	People Living with a Disability
PMG	Producer Marketing Groups
PO-RALG	President's Office – Regional Administration and Local Governments
PPD	Public Private Dialogue
PPP	Public Private Partnership
QDS	Quality Declared Seeds
RAS	Regional Administrative Secretary
R&D	Research and Development
REA	Rural Energy Agency
REMP	Rural Energy Master Plan
RFP	Request for Proposal
RoI	Return on Investment
RRF	Regional Revolving Fund
RUTF	Ready-to-Use Therapeutic Food
SACCOS	Savings and Credit Cooperative Society
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
SAIIA	South African Institute of International Affairs
SANVN	SIDO, Azania Bank, NEEC, VETA, & NSSF
SAT	Sustainable Agriculture Tanzania
SBL	Serengeti Breweries Limited
SCCULT	Saving and Credit Cooperative Union League of Tanzania
SCGS	Smallholder Credit Guarantee Scheme
SDGs	Sustainable Development Goals
SHFs	Smallholder farmers
SIDO	Small Industries Development Organization
SIM	Subscriber Identity Module
SMEs	Small and Medium Enterprises
SMS	Short Messaging System
SNV	Netherlands Development Organization
SUA	Sokoine University of Agriculture
SUFA	Sunflower Farmers Association
SWP	Solar Water Pump
TADB	Tanzania Agricultural Development Bank
TAFOPA	Tanzania Food Processors Association
TFRA	Tanzania Fertilizer Regulatory Authority
TAHA	Tanzania Horticulture Association
TAHEA	Tanzania Home Economic Association
TANIPAC	Tanzania Initiative to Prevent Aflatoxin Contamination

TAP	Tanzania Agricultural Partnership
TARI	Tanzania Agricultural Research Institute
TARIC	TAHA-Research and Information Centre
TASAI	The African Seed Access Index
TASTA	Tanzania Seeds Traders Association
TASUPA	Tanzania Sunflower Processors Association
TBL	Tanzania Breweries Limited
TBS	Tanzania Bureau of Standard
TCAA	Tanzania Civil Aviation Authority
TCB	Tanzania Coffee Board
TCCIA	Tanzania Chamber of Commerce, Industry and Agriculture
TCDC	Tanzania Cooperative Development Commission
TCRA	Tanzania Communication Regulatory Authority
TEMDO	Tanzania Engineering and Manufacturing Design Organization
TFC	Tanzania Federation of Cooperatives
TFNC	Tanzania Food and Nutrition Centre
TFRA	Tanzania Fertilizers Regulatory Authority
TGNP	Tanzania Gender Networking Programme
TIRA	Tanzania Insurance Regulatory Authority
TIRDO	Tanzania Industrial Research and Development Organization
TL	Team Leader
TMX	Tanzania Market Exchange
TOSCI	Tanzania Official Seeds Certification Institute
TPHPA	Tanzania Plant Health and Pesticides Authority
TTCL	Tanzania Telecommunication Company Limited
TZDGP	Tanzania Development Partner Group
TZS	Tanzanian Shilling
UK	United Kingdom
UN	United Nations
URT	United Republic of Tanzania
USAID	United States Agency for International Development
USD	United States Dollars
USDA	United States Department of Agriculture
USSD	Unstructured Supplementary Service Data
VAT	Value Added Tax
VC	Value Chain
VCA	Value Chain Analysis
VCD	Value Chain Development
VETA	Vocational Education and Training Authority
VICOBA	Village Community Bank
VSLA	Village Saving and Loan Association
VSLG	Village Saving and Loan Group
WBG	World Bank Group
WFP	World Food Programme
WMA	Weights and Measures Authority
WRRB	Warehouse Receipt Regulatory Board
WRS	Warehouse Receipt System
WTO	World Trade Organization
WWF	World Wide Fund for Nature
WYPWD	Women, Youth, People with Disabilities
WYPWDEF	Women, Youth, People with Disabilities Empowerment Fund
YIA	Youth Initiative in Agriculture
YSLA	Youth Saving and Loan Association

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Figures and Tables

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We stress that opinions expressed in this report are purely those of the authors based on observations and findings of this exercise and that ANSAF - and not WFP - and its partners take sole responsibility for any errors or omissions.

Thank you

Executive Summary

Background and the context

The World Food Programme (WFP) is the world's largest humanitarian agency fighting hunger worldwide. WFP pursues a vision of the world in which every man, woman, and child has access at all times to the diverse foods needed for an active and healthy life. WFP Tanzania has been connecting smallholder farmers to markets since the launch of the Purchase for Progress (P4P) pilot in 2009. WFP has been supporting Micro, Small, and Medium Enterprises (MSMEs) to strengthen the ecosystem in which smallholder farmers can access affordable inputs, services, and markets.

WFP engaged Agricultural Non State Actors Forum (ANSAF) to conduct a market study and Value Chain Analysis (VCA) for maize, soybean, sorghum, sunflower and horticulture products covering Arusha, Dodoma, Kigoma, Kilimanjaro, Manyara, Mara, Shinyanga, Simiyu, and Singida regions in Tanzania. The goal of the analysis is to inform the implementation of the WFP's upcoming Strengthening Food Systems to Empower Smallholder Farmers and Young People project which aims to support MSME development, post-harvest loss management, and scale support to the maize, sorghum, beans, and horticulture value chains, targeting smallholder farmers and youths, especially women. This study will help WFP to identify investments with the greatest potential to benefit target groups; create sustainable rural jobs; engage technologies that minimize post-harvest losses, create viable market linkages and address information gaps; and promote rural women's and youth´s economic empowerment

Methodology

The Consultant employed three intertwined methodologies and predominantly qualitative to undertake this assignment namely, Value Chain Analysis (VCA), Market System Analysis (MSA) and Value chain financing mapping. Moreover, the Consultant complemented the methodology with ValueLinks to understand firms that operate within the industry — from input suppliers to end-market buyers; the support markets that provide technical, business and financial services to the industry; and the business environment in which the industry operates.

To achieve these, the Consultant conducted key informant interviews (KIIs) with various stakeholders along the four value chains - sorghum, sunflower, onion, and tomato. The information collected include the challenges and opportunities related to post-harvest management, job creation, markets and inclusion of youths especially young women. Moreover, the Focus Group Discussion (FGD) was employed to obtain in-depth information (qualitative data) from various groups of sorghum, sunflower, tomato, and onion stakeholders, particularly SHFs. Also, profitability data was collected from key informants such as producers, traders/aggregators, wholesalers, processors and retailers. The information was used to derive the market gross margins for selected value chains.

Key findings

<u>Sorghum</u>

In Tanzania sorghum is the 3rd most important cereal after maize and paddy according to the 2019/20 National Sample Census of Agriculture (NSCA) (NBS. 2021). The census results show that 551,817 households in Tanzania planted sorghum on 514,435 ha of which 512,767 ha were farmed by smallholder farmers (SHFs)[1] and 1,547 ha by large scale farms (LSFs). The gross profit for farmers that sell to primary traders is lower, at TZS 350per kg. However, in a scenario where farmers practice GAP and are directly linked to off-takers gross profit per kg will increase from TZS 350 to TZS 575.

Sorghum presents several opportunities for job creation and inclusion of women and youth. For example, there is a growing export market in South Sudan, Sudan, Burundi, Rwanda etc. The government (through CPB) has a selling center in Juba accessible to public and private exporters. The presence of institutional buyers like WFP, NFRA, and CPB has helped to institute technical specifications demanded by the export market. The domestic and export markets are expected to grow in tandem. Furthermore, contract farming is expanding, it will enable youths and women integrate and access remunerative markets because it lowers barriers to capital and access to market that affect youth and women more. There is an opportunity for youth to provide mechanisation services for hire such as tilling, planting, harvesting and threshing. Also, there is opportunity to support women and youth in value addition such as production of various food sorghum-based products widely consumed in urban areas such as noodles, cakes, bread, blended flours, parboiled, etc. which WFP Tanzania country office could leverage on by partnering with ONA, SIDO, TNFC, ICRISAT and SUA to scale up through support of awareness creation, marketing skills and credit guarantee for equipment.

[1] Cultivated farms not exceeding 20 hectares

Sunflower

The study found that the average yield of sunflower using common farmers' practice is 560 kg per acre. However, if hybrid seeds are adopted the yield could increase by 50% to 840 kg per acre. The study found that the adoption of hybrid seeds combined with good agricultural practices (GAP) increase yield from 560kg to 1,050kg per acre. It is estimated that sunflower small-scale processors operate at an average capacity of 20 percent, while larger processors operate at between 25 percent and 40% of their installed capacity due to poor supply, storage, electricity, and capital. As a result of limited seed supply during harvesting season, majority of the processors operate not more than five months a year. For instance, Pyxus (Dodoma) has an annual capacity of 20,000 MT but achieves only 5,000 MT. This is attributed by a myriad of factors which include low knowledge and skills among farmers which affect their adoption of agricultural practices and technologies. For example, the adoption of hybrid seeds that have been confirmed to have a higher yield of seeds rich in oil, and the adoption of inorganic fertilizers is still low. Climate change (i.e., temperature change, unreliable precipitation on rainfall patterns, flood and drought significantly affects sunflower production. The study also identified inadequate access to land ownership by women and youth due to cultural norms and the high cost of renting which limits their participation in the value chain, and an unfriendly business environment associated with multiple taxes and unpredictable policies which discourage investment in sub-sector.

Despite the challenges, sunflower value chains present several opportunities for marketing development, job creation and inclusion of women and youth. The availability of sunflower oil processors such Pyxus Agriculture Tanzania and input suppliers such as Balton Tanzania which organize contract farming, provision of hybrid seeds, and provide demonstration plots provides an opportunity to improve productivity and market to the farmers. This offers a viable opportunity to attract youth into the value chain. For example, the recently launched Building Better Tomorrow (BBT)-Tanzania Youth in Agribusiness program by the government pledges to allocate land for youth and women who are motivated to engage in agriculture. Sunflower is one of the priority crops and the government has already allocated land in Dodoma region and started a dialogue with companies such as Pyxus for contract farming arrangement.

Onion

According to the National Agriculture Sample Census of 2019/202 the number of households that cultivated onion increased to 52,097 from 32,560 reported in the Agriculture Annual Sample Survey of 2016/2017. Similarly, the total production was 63,956 MT cultivated on 28,335 hectares. The national average yield was 4.1MT/ha. Onion is grown in all eight WFP targeted regions. *Red Bombay* is the most preferred variety in Tanzania, Kenya and Rwanda for its high yield (80bags/acre), marketability and bulb size, while *Khaki* is preferred for its storability. Onion is widely traded in the EAC, it moves rather freely across borders and is less influenced by food security policies that characterize many staple foods. Tanzanian onions are in highly demand in Kenya, Uganda, Comoros, Democratic Republic of Congo (DRC), India and Botswana. Though Tanzania produces a significant quantity of onion, the production is not sufficient to meet both the domestic and external demand. Despite the huge market demand, storage of onions is still challenge in most of areas where the research was conducted (e.g., Ruvu ward in Same district, Mang'ola ward in Karatu district, Kahe ward in Moshi DC). Based on this, farmers sell their products immediately after harvest mostly at farmgate prices.

However, onion presents huge opportunities for women and youth inclusion as well as job creation. Existing initiatives such as East Africa Fruits (EAFC Limited) contract farming scheme is an opportunity for organized SHFs to secure a reliable and lucrative market for their produces. Similarly, the contract farming model practiced by Rikolto at *Msitu wa Tembo* ward in Moshi Rural district links farmers with reliable buyers and therefore reduce risks to the farmers. Existence of onion market centers (e.g., Singida region) enable SHFs and rural traders to sell to the wholesalers and regional traders; this model is suitable for replicating in other onion-growing regions. Also, the existence of strong umbrella organizations such as TAHA and other NGOs such as Rikolto who mobilize farmers, offers extension services, provide market information and link farmers to market and financing is an opportunity for the project to forge strong partnership.

Tomato

In Tanzania, production of tomato is predominantly undertaken by smallholder farmers. According to the 2019/2020 National Sample Census of Agriculture (NSCA), production of tomato was 329,907 MT, out of which 99.7% was produced by smallholder farmers most of whom depend on rain, therefore supply fluctuates with each season. Tanzania is a net exporter of fresh tomato, mostly to Kenya and to a lesser extent to Comoros and the DRC; exports happen when export parity prices justify the costs - of the product, transport, losses, etc. Tanzania imports significant amount of tomato pulp from China, reconstitute, pack and sell in various products.

Tanzania has expanded tomato-processing capacity in Iringa, Arusha and Dar es Salaam. Tomato processing at factory scale relies on surplus produce after the demand for fresh tomato has been met. Note that at farm level processors offer lower price compared to the fresh tomatoes at local markets. Tomato can be processed at household, cottage and SME levels due to scalability of processing technologies. Tomato paste-based products including tomato sauce, chili sauce, garlic chili, juice and wine can be produced using domestic equipment. Production process involves cleaning, cutting/slicing, pulping, concentration and blending, packaging, sterilization, cooling and finally labeling. The challenge has been affordable packaging materials. SIDO offers various trainings on processing of tomato.

Tomato sub-sector employs more women and youths in almost every node along the supply chain– production, marketing (wholesaling and retailing), and value addition with relatively higher return if marketed off-season compared to other crops. Likewise, youths can be organized, trained and equipped to undertake the following:- (i.) joint supply of inputs (seeds, fertilizers and agro-chemicals) and application of associated farm management services, (ii.) commercial production and marketing of bio-pesticides targeting organic markets; a church-sponsored youth project in Same has specialized in bio-pesticides (iii.) making packaging materials from sustainably harvested wooden and bamboo resources, (iv) installation and management of irrigation systems and rain water harvesting systems, (v.) installation and management of cold-chain facilities. (vi.) Youths should be targeted by investment opportunities for MSMEs tomato-processing business.

Finance Landscape

Despite the numerous financing opportunities available from both financial and non-financial institutions, access to services for farmers is still a challenge as compared to for traders and processors. Moreover, there is little preferential treatment for marginalized groups (women, youth and PWDs) in accessing credit from private-sector lenders (banks, SACCOS) due to stringent requirements. However, public-sector institutions (e.g., TADB, LGA Loan) respectively offer credit at low interest (9%) and zero interest to farmers. Also, some banks such as NMB and CRDB have crop insurance windows to cushion the risks associated with effects of climate change and other calamities.

The mobile money service options have broadened access to financial services such as savings, and micro credit and helped to reduce transactional and transportation costs incurred by small holder farmers as it has made financial transactions seamless (AfDB, 2019). Data suggests that 82% of farmers have used mobile phones before and 89% of the farmers who have used a phone have access only to basic phones. Moreover, mobile money services have revolutionized farmers' savings and micro-credit in the country, as it represents the second most preferred form of saving (CGAP, 2019). Thus, mobile phones can be considered a key financial tool that investors can use to reach out and fund up to four-fifths of smallholder farmers.

Proposed Development Interventions

The study recommends WFP to deploy a multi-stakeholder approach to work with diverse actors from public and private sectors along the four outcome areas to achieve systemic changes in the value chain. The value chain has the potential for market and quality development, creating jobs and inclusion of youths, especially women in different nodes. Some of the recommended interventions for sorghum, sunflower, onion and tomato include skills and knowledge development to women, youths and people with disabilities on good agricultural practices across all nodes, awareness creation and training to increase adoption of best practices and post-harvest technologies, promotion of agro-mechanization and value addition technologies, promote access to inclusive financing to women, youths and people with disabilities, strengthening of farmers organizations (FOs) for collective marketing and access to inputs, strengthen capacities of MSMEs, in particular those led by women and youth to grow their businesses, formalize and engage in trade, advocacy for inclusion of women and youth, improved polices and friendly business environment. For example, WFP is advised to facilitate implementation of the national post-harvest management strategy and operationalization of contract farming law.

Recommendations to WFP

In undertaking this assignment, ANSAF solicited insights from interaction with WFP, engagement with stakeholders during data collection and validation workshops. It is from this background that ANSAF has arrived at the following specific recommendations to WFP which include:

1. Proposed multi-stakeholder partnerships (MSPs) approach

Due to the nature of this project and the need to work closely with various public and private sector partners, it is recommended that WFP should use the concept of Multi-stakeholder partnerships (MSPs) as an instrument for improving competitiveness and inclusiveness in value chain development (VCD), particularly because WFP will tap into the wealth of stakeholders with unique complementary strengths and core competences that will add value to the intervention and essentially fast-track improvement in VCs' competitiveness and inclusion of youth, women and people with disabilities (PWDs) through employment, market access, structured trade, access to finance and good agronomy practice (GAP).

2. Prioritization and selection of partners to work with WFP especially last mile service providers

While this report provides WFP with a wide choice of potential partners and collaborators, it would be necessary for WFP to undertake a stakeholder mapping and assessment to identify and select the "best fit" collaborators using set of assessment and selection criteria. One of the important criteria is partnering with last mile service providers. Business partnerships between last-mile firms such as agribusinesses or agri-focused technology providers, capacity building organizations and financial institutions (FIs) present a high-potential opportunity to improve the delivery of financial products and other services to smallholder farmers especially women and youth.

While there is no "one-size-fits-all" approach, successfully forming and maintaining partnerships appears more likely when there are strong relationships, structured processes, and resources dedicated to managing partnerships. Firms also appear more likely to overcome partnership challenges if the following internal and external supporting factors are in place:

- Partner's strategic commitment to work with smallholder farmers
- Partner's dedicated partnership teams

- Last-mile firm connections with a large farmer base
- Last-mile firm capability to build and demonstrate a strong business case
- Character of the partner organizations and leaders

3. Prioritization of interventions: Think big, start small, harvesting the low-hanging fruit

Many interventions have been proposed in this report and there is need to prioritize them starting with the "low hanging fruit" and build on experience and momentum to embrace other interventions. The implementation plan for this WFP project can be developed with various levels of ambition. As an end goal WFP (and Master Card Foundation (MCF)) want to reduce post-harvest losses, increase value and volume of sales and improve incomes, and employment inclusion of marginalized groups along the agricultural value chains. A practical way to take the first steps is to benefit from ongoing initiatives that WFP could build on and achieve its objectives through adapting and scaling up.

For example, several business models have been tested and piloted in some WFP targeted regions in a structured way. These initiatives could be easily adapted and scaled up with little effort. WFP could make some of them more innovative as a new way of enhancing inclusiveness (youth and women) in an efficient and cost-effective way saving effort and costs.

Another opportunity may be to review and upgrade inventory credit system (ICS) that has worked in one crop (e.g. Mbugwe sunflower AMCOS in Babati district) and replicate them in other areas before undertaking full-fledged promotion of warehouse receipt system (WRS) and inclusive contract farming (ICF) in all VCs in all project regions. Similarly, WFP may review and upgrade ICF schemes that have worked in sunflower (e.g. Pyxus, Ally Juma, Tausi, Three Sisters, and Mount Meru) and replicate them in other areas before undertaking full-fledged promotion of ICF in all VCs in all project regions.

4. Cost-benefit analysis of proposed technologies before proceeding to promote them

A number of production, post-harvest and processing technologies have been promoted and are available for WFP to emulate; however, cost-benefit analysis (CBA) for each of the proposed, available and accessible technologies will inform WFP more and ensure they promote the most appropriate (user-friendly, available, affordable) for the target group i.e. women and youth.

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