THE UNITED REPUBLIC OF TANZANIA

UNITED NATIONS FOOD SYSTEMS SUMMIT 2021

NATIONAL ROADMAP TO SUSTAINABLE FOOD SYSTEMS TRANSFORMATION BY 2030

Leaving no one and place behind

SEPTEMBER, 2021

FOREWORD AND ACKNOWLEDGMENTS

In 2019, the Secretary-General of the United Nations, Mr. António Guterres, called for a Food Systems Summit and engagement process to unleash the power of food and deliver progress on all 17 UN Sustainable Development Goals (SDGs). In preparing for the Summit, the Government of the United Republic of Tanzania (URT) conducted a number of dialogues (12 events) with a diverse range of stakeholders (over 820 physically and 650 virtually) including farmers, youth, business community, Civil Society Organisations (CSOs), smallholder farmers, Members of Parliament, food vendors to scientists as well as chief executive officers (CEOs).

As a nation, URT appreciates food systems transformation initiatives and joins coalitions and partnerships to transform food systems to realise the Sustainable Development Goals come 2030. Tanzania's Ministry of Agriculture in collaboration with the Sector Lead Ministries, UN Agencies, International and Local Non-governmental Organisations (NGOs) convened inclusive dialogues at community, sub-national, sectorial and national levels. These dialogues enabled diverse participants to work together on exploring challenges and options to transform food systems in a manner that contributes to the realisation of the vision of the 2030 Agenda for Sustainable Development in the Tanzanian context. The dialogues were effective platforms where visions and voices of a spectrum of stakeholders were harnessed to inform the future and pathways to Sustainable Food Systems and SDGs at large. The discussions were consolidated into six main levers of food systems transformation drives, namely: 1) Production and productivity in crop, livestock and fisheries sub-sectors; 2) Financing agriculture and private sector involvement; 3) Nutrition/Heath diets and safe food for all and school feeding programmes; 4) Climate change adaptation and biodiversity protection; 5) Resilient food systems and livelihoods; and 6) Sustainable food systems enablers including ICT, gender, environment, equity, R&D, political economy etc.).

The national process was coordinated through a Technical Coordination Team (TCT) with representatives across key sectors and stakeholders in both Tanzania mainland and Zanzibar. Representatives from the public sector included the Ministry of Agriculture (MoA); Ministry of Livestock and Fisheries (MLF); Prime Minister's Office (PMO); Ministry of Health, Community Development, Gender, Elderly and Children (MOHCDGEC), Ministry of Education, Science and Technology (MoEST), Ministry of Industry and Trade (MIT). The Country Dialogues and reporting process were technically and financially supported by the UN agencies (FAO, IFAD, UNEP, UNICEF, WFP and WHO), Alliance for Green Evolution in Africa (AGRA), Global Alliance for Improved Nutrition (GAIN), Avi Agro-forest, We Effect, SAGCOT, ANSAF and CSOs.

On behalf of all stakeholders, we are grateful to all participants in the dialogues for their visions and views that have defined the Tanzania's visionary futures and pathways to sustainable food systems and development by 2030.

Hon. Hussein Bashe
Minister of Agriculture, URT

Hon. Shamata Shaame Khamis
Minister of Agriculture, Natural Resources, Livestock and Irrigation, Zanzibar

Mr. Zlatan Milisic
UN Resident Coordinator, URT

Vision Statement to national pathways to sustainable food systems

By 2030, all Tanzanians will have access to healthy diets and safe foods, focusing on life-cycle, and address all forms of malnutrition. Sustainable food systems will nourish United Republic of Tanzania's population, strengthen local production and distribution, generate competiveness for industrialisation, offer equitable livelihoods, be resilient to vulnerabilities, shocks and stresses, steward the biodiversity, and help mitigate and adapt to climate change by shifting the food systems towards green growth.

The UN's 2021 Food System Summit (UNFSS) has allowed a renewed outlook into strategic action pathways needed to build sustainable food systems. Before, during and after the Summit, these actors will come together to bring about tangible, positive changes to the world's food systems.

The Summit resonates to a philosophy of "Leaving No One Behind". The UNFSS is framed on five Action Tracks: 1) Ensuring access to safe and nutritious food for all; 2) Shifting to healthy and sustainable consumption patterns; 3) Boosting nature positive production; 4) Advancing equitable livelihoods; and 5) Building resilience to vulnerabilities, shocks and stresses.

In the URT, 12 issue-based multi-stakeholder dialogues brought together about 1,500 participants through both physical and virtual meetings. The categories of stakeholders involved in the dialogues included farmers, youth, business community, activists, indigenous leaders, smallholder farmers as well as scientists and CEOs. The views and voices of multiple stakeholders were consolidated into action pathways towards sustainable food systems. The pathways are further contextualized in the national policy and development spaces, and commitments to sustainable development.

The six transformative pathways to sustainable food systems defined through multi-stakeholder dialogues were: 1) Production and productivity in crop, livestock and fisheries sub-sectors; 2) Financing of agriculture and private sector involvement in the food systems; 3) Nutritious, healthy and safe food diets for all and school feeding programmes; 4) Climate change mitigation, adaptation and biodiversity protection; 5) Resilient food systems and livelihoods; and 6) Sustainable food systems enablers including ICT, gender, environment, equity, R&D and political economy. Furthermore the stakeholders underscored the game-changing solutions underlying these pathways.

- **Sustainably improved food production and productivity:** ensure equitable access and sustainable management of land and water resources; increased investment in productive infrastructure including irrigation rural roads and fishing facilities; increase public-private investments in improved seeds, semen, animal breeds and fingerlings; promote precision and climate-smart agriculture, and expand access to extension and advisory services.

- **Increase financing of agriculture and private sector engagement:** improve access to agricultural finance by smallholder farmers and fishers, formalisation of land and livestock assets as collateral; promote credit guarantee schemes to improve lending to smallholder farmers and fishermen; strengthen block and contract farming systems; support schemes for agribusiness off-takers, improve business environment and investment climate in agriculture and food systems by implementing reforms stipulated in the blueprint of regulatory reform for improved business environment.

- **Ensure nutritious, healthy and safe food diets for all:** promote nutrition-sensitivity of local production systems and food supply chains, support raring of small animals and aquaculture at community levels, commercialisation of nutrient-dense, commercialisation of nutrient-dense bio-fortified crops, promote school feeding programmes, improve infrastructure in territorial food markets, coordinated and well-targeted food emergency and assistance to the most vulnerable, promote sanitation and good hygiene practices, promote healthy eating and lifestyle through application of Food Based Dietary Guidelines (FBDG), awareness creation for aflatoxin control, support women and youth run healthy agri-food enterprises, and create food environments where consumers can make healthy food choices through regulation of food marketing.

- **Climate change mitigation, adaptation and biodiversity protection:** increased investments in mass public transportation and energy to curb emissions and deforestation, scaled-up conservation efforts of biodiversity through sustainable management of forestry, wildlife and wetlands, and strengthen the capacity of the National Carbon Monitoring Centre (NCMC) capacity to measure, verify and report adequately on national carbon emissions.

- **Resilient food systems and livelihoods:** address vulnerabilities and poverty to strengthen the resilience of food systems; build networks and infrastructure to safeguard against shocks and stresses including pandemics; strengthen Tanzania's Food and Nutrition Security Information System (MUCHALI) and Zanzibar Food Security and Nutrition Monitoring and Early Warning System (ZFSNIEWS); advance disaster risk surveillance and early warning systems for timely mitigation, response and recovery strategies; integrate adaptation, disaster risk reduction and social protection to build long-term resilience of vulnerable communities and systems; and maintain sustainable food reserves; increase provision of drought resistant crops; avail well-targeted comprehensive stimulus package to support the food systems recovery from COVID-19 pandemic; reduce waste and food losses by implementing the post-harvesting management strategy; increase renewable energy uses; and promote circular economy to optimize the food systems.

- **Implement sustainable food systems enablers including ICT, gender, environment, equity, R&D, and political economy:** fast-track legal frameworks for protection of agricultural land; effectively implement policy actions to address climate change, promote sustainable circular economy in the food systems; promote gender mainstreaming in policies and plans; mainstream nutrition in agricultural policies; design economic incentive structures and legal frameworks to promote nutrition-sensitive agri-food industry; promote the use of ICT and digitilisation of agriculture, improve safety, and security and rescue of fishermen through provision of proper fishing gears and maritime surveillance and patrols.

The thrust of the country's multi-stakeholder dialogues was to kick-start an inclusive journey of advancing the food systems for sustainable development agenda of 2030. The post-summit way forward will include addressing the following broader tasks:1) development of an action plan with results areas, indicators of targets for game-changing solutions that are aligned with existing sustainable development commitments by 2030; 2) undertake systematic analysis and mapping of stakeholders that are strategically needed to engage at different levels for implementing the game-changing solutions; and 3) development of results-based monitoring and evaluation framework outlining how stakeholders will review, track progress and evaluate accomplished results.

TABLE OF CONTENTS

ACRONYMS

AGRA	Alliance for Green Revolution in Africa
AI	Artificial Intelligence
ANSAF	Agriculture Non-State Actors Forum
ASDP II	Agriculture Sector Development Programme II
AU	African Union
CAADP	Comprehensive Africa Agriculture Development Programme
CCM	Chama Cha Mapinduzi
CSA	Climate Smart Agriculture
EAC	East Africa Community
FAO	Food and Agriculture Organisation
FYDP III	Five-Year Development Plan III
GAIN	Global Alliance for Improved Nutrition
GDP	Gross Domestic Product
ICT	Information and Communication Technology
IFAD	International Fund for Agriculture Development
km	Kilometre
MANIL	Ministry of Agriculture, Natural Resources, Livestock and Irrigation, Zanzibar
MBEF	Ministry of Blue Economy and Fisheries
MLF	Ministry of Livestock and Fisheries
MoA	Ministry of Agriculture
MoEST	Ministry of Education, Science and Technology
MOHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
Mt	Metric Ton
NDC	Nationally Determined Contributions
PA	Precision Agriculture
PMO	Prime Minister's Office
R&D	Research and Development
RECs	Regional Economic Communities
SAGCOT	Southern Agriculture Growth Corridor of Tanzania
SDGs	Sustainable Development Goals
SGR	Standard Railway Gauge
RGoZ	Revolutionary Government of Zanzibar
TZS	Tanzanian Shillings
UN	United Nations
UNFSS	United Nations Food Systems Summit
US $	United States Dollar
WFP	World Food Programme

LIST OF FIGURES

1.0 INTRODUCTION

The UN's 2021 Food Systems Summit (UNFSS) has allowed a renewed outlook into strategic action pathways needed to build sustainable food systems. Before, during and after the Summit, the actors will come together to bring about tangible, positive changes to the world's food systems. At the world as well as at the country levels, the UNFSS underpins the fact that we all must work together to transform the way we produce, consume and think about food. It is a summit for everyone everywhere – a people's summit that tries to account for every voice by resonating to the philosophy of "Leaving No One Behind". The UNFSS is framed on five Action Tracks: 1) Ensuring access to safe and nutritious food for all; 2) Shifting to healthy and sustainable consumption patterns; 3) Boosting nature positive production; 4) Advancing equitable livelihoods; and 5) Building resilience to vulnerabilities, shocks and stresses.

In Tanzania, this call was well received and the Ministry of Agriculture (MoA) was given the coordination role to ensure all stakeholders involved in food systems were involved. To this effect, 12 issue-based multi-stakeholder dialogues brought together about 1,500 participants through both physical and virtual meetings. The categories of stakeholders involved in the dialogues included farmers, youth, members of the business community, activists, indigenous leaders, smallholder farmers, scientists and CEOs. The dialogues served as platforms where visions and voices consolidated into a common course of actions and commitments to deliver healthier, equitable, resilient and sustainable food systems by 2030.

The Summit is not the beginning and the end by itself, but rather a momentous launch of multi-stakeholder coalitions and strategic pathways towards sustainable food systems by 2030. In this regard, this report crafts a national roadmap towards that desired food systems futures. The roadmap draws from UNFSS' multi-stakeholder dialogues, and national development agenda and trajectories to provide pathways which will transform the Tanzanian food systems to achieve the Sustainable Development Goals (SDGs) by 2030.

The roadmap report is organised into Five Sections. First, the introduction, which covers the background to the UNFSS process. Second, the approach and process entailing the multi-stakeholders dialogues guided by action tracks up to consolidation of pathways with underlying game-changing solutions and milestones. The third section addresses the perspectives of the Tanzanian food systems covering sustainable development, major drivers and development landscape of the food systems in the country. The fourth section covers the roadmap to sustainable food systems from action tracks, dialogues to pathways. The fifth section covers initial mapping of key stakeholders of sustainable food systems. The last but not least section addresses the post-summit way forward underpinning key broader tasks into the futures of sustainable food systems.

2.0 THE APPROACH AND PROCESS: THE PATH TO THE ROADMAP

2.1. The process overview

The UNFSS process underlies the genesis of the national transformative roadmap to sustainable food systems. Through dialogues guided but not prescribed by UNFSS five Action Tracks, the views and voices of multiple stakeholders have been consolidated into action pathways towards sustainable food systems. Such action pathways are further contextualised in the national policy and development spaces to inform the national transformative roadmap to inclusive, equitable, resilient and sustainable food systems by 2030.

Under the UNFSS process, an inclusive national Technical Coordination Team (TCT) with representation across key sectors and stakeholders. Representatives from the public sector included the Ministry of Agriculture (MoA); Zanzibar's Ministry of Ministry of Agriculture, Natural Resources, Livestock and Irrigation (MANLI), Zanzibar's Ministry of Blue Economy and Fisheries (MBEF), Ministry of Livestock and Fisheries (MLF); Prime Minister's Office (PMO); Ministry of Health, Community Development, Gender, Elderly and Children (MOHCDGEC), Ministry of Education, Science and Technology (MoEST), and the Ministry of Industry and Trade (MIT).

The TCT's activities involved planning and running national dialogues, using results from the dialogues to prepare the national pathways and the roadmap to sustainable food systems. Across finance, technical and advocacy fronts, the entire process was supported by the UN agencies through World Food Programme (WFP), Alliance for Green Revolution in Africa (AGRA), Global Alliance for Improved Nutrition (GAIN), Avi Agro-forest, We Effect, SAGCOT and ANSAF.

2.2 Multi-stakeholder dialogues: The process and feedbacks

The UNFSS provided an operational framework to guide the Member State Dialogues (UNFSS 2020). This suggested methods that would be customized to national contexts to help run professional and successful multi-stakeholder dialogues to inform national pathways to sustainable food systems. The main outcome of the member state dialogues was to undertake inclusive engagements with key stakeholders in the food systems to account for their views and voices to inform national pathways to sustainable food systems.

In Tanzania, 11 multi-stakeholder thematic dialogues drawing from a diverse range of stakeholders were conducted between May and August 2021. The 11 multi-stakeholder issue-based dialogues undertaken include:

1. Two urban food systems dialogues in Dodoma and Arusha: local government and city planners, and urban dwellers;
2. Women land rights and sustainable food systems – involving national gender, legal and advocacy groups, and planners;
3. Agro-ecology for sustainable food systems: policy, research, training and extension – driven mainly by smallholder farmer organisations and civil society actors in sustainable agriculture;
4. Ensuring access to safe and nutritious foods – undertaken with a parliamentary caucus on food safety;
5. Sustainable food systems in Tanzania: lessons for sustainable pathway – involved a mixed range of stakeholders from the public, civil society and private sector;
6. Two sub-national dialogues conducted in Southern Highlands and Lake Zones titled "Rethinking food systems for safe and nutritious food for equitable livelihoods";
7. Rethinking food systems for safe and nutritious food for equitable livelihoods – implemented with non-state and civil society actors;
8. Youth engagement in innovations for sustainable food systems – that engaged with youths and advocates of youth issues;
9. Achieving blue economic growth and supporting food systems transformation – conducted with different categories of farmers in Zanzibar;
10. Food system transformation is our responsibility: play your part – the national food systems dialogue; and,

11. Annual agricultural policy conference – that addressed policy and governance issues for sustainable food systems.

In terms of composition, the country dialogues included smallholder farmers and fishers, youth, members of the business community, community-based organisations, Members of Parliament, food vendors, scientists and CEOs. Across the country, about 1,500 stakeholders were engaged of which over 820 through physical meetings and 650 through virtual online meetings. The feedback and results from these dialogues were the basis of the national pathways to sustainable food systems in line with the 2030 Agenda for sustainable development.

2.3 National pathways and roadmap to sustainable food systems

The multi-stakeholder dialogues drew the ambitions of everyone from across the country into a common vision with action pathways to sustainable food systems aligned to national commitments towards sustainable development agenda by 2030. The stakeholders identified the critical issues to be addressed to pave a path towards efficient, inclusive, resilient and sustainable food systems. The critical issues entailing set of game-changing solutions and the outcome milestones defined the action pathways to sustainable food systems. The critical issues identified from the multi-stakeholder dialogues include:-

1) Production and productivity in crop, livestock and fisheries sub-sectors;
2) Financing agriculture and private sector involvement;
3) Nutritious, healthy and safe food diets for all,
4) Climate change mitigation, adaptation and biodiversity protection;
5) Resilient food systems and livelihoods; and
6) Sustainable food systems enablers including ICT, gender, environment, equity, R&D, political economy etc.).

Furthermore, through working-meetings of the TCT, stakeholders' validation and reviews process, the action pathways were enriched with evidences for the development rationale, game-changing solutions and alignment of pathways with planned development commitments and trajectories into a transformative roadmap towards sustainable food systems.

3.0 TANZANIAN FOOD SYSTEMS IN PERSPECTIVES

3.1. Tanzanian food systems and sustainable development

The agriculture sector is the hallmark of Tanzania's economy and food systems. Agriculture is the main source of food and livelihoods employing about 65% of the population with GDP shares of 27% and 21% for Tanzania mainland and Zanzibar, respectively (URT 2021a, RGoZ 2020b). The sector contributes about 30% of the total export earnings and supplies 65% of all industrial raw materials in the country. Such potential makes agriculture an engine for inclusive growth hence contributing eminently to delivery of 2030 agenda of sustainable development.

Due to its agro-ecological diversity, Tanzania commands diverse food systems entailing crops, livestock and fishery agri-food sub-sectors. The food systems in the country vary according to agro-ecological zones, socio-economic status, rural-urban settings, market infrastructure, and culture and norms that shape dietary and consumption patterns. Tanzanian food systems are based on primary production and extraction sectors – hence an integral of the environment. However, unsustainable production and extraction technologies and practices are triggering an alarming trends of resource degradation, biodiversity loss and erosion of ecosystem services (SGDs 12, 13, 15). The impacts of such negative trends are further exacerbated by climate change (SDG 13) – that altogether intricately relate to multi-dimensional poverty (SGDs 1, 6, 7).

Structurally and functionally, a food system entails food value chains, food environments and consumer behaviours that interact with drivers to result into certain outcomes. Such elements are shaped by a range of drivers – biophysical, technological, political economy (all 17 SGDs), and socio-cultural/demographic (SGDs 3, 4, 5, 8). The outcomes of a sustainable food system envisage among others improved food and nutrition security, health, income, and environmental sustainability. The need to feed a growing population with increasing food quality requirements, while preserving biodiversity and environmental resources, including ground and surface water, atmosphere, soils and biodiversity, thus poses a major challenge to global agriculture (Billen et al. 2015). The Tanzanian food systems are increasingly connected to other biomass sub-sectors such as feed and fodder, and forestry systems.

Despite some positive progress made so far, including attainment of food self-sufficiency, the stakes are still high for the Tanzanian food systems to deliver intended outcomes, particularly sustainable food and nutrition security for all. Apparently, food self-sufficiency ratio (SSR) does not guarantee nutrition security in the country as this has co-existed with highest levels of undesirable nutrition outcome of stunted children under five years of age. Regions with higher SSRs have registered highest levels of child stunting: Ruvuma (SSR 237%: stunting 41%), Njombe (SSR 194%: stunting 53.6%), Rukwa (SSR 230%: stunting 47.9%), Iringa (SSR 161%: stunting 47.1%) and Songwe with SSR of 210% registers stunting rate of 43.3% (TDHS 2016, URT *forthcoming*). The excess production of cereals can only suffice caloric sufficiency but not necessarily help the population to meet micronutrients requirements, which are mainly derived from diverse foods including grain legumes, fruits, vegetables and animal source foods.

Therefore, innovative strategies and systematic approach is required in transforming food systems, to deliver healthier diets sustainably and equitably. Improved food systems will contribute to improving access to diverse foods, fighting poverty by creating decent jobs, and supporting health of rural and urban poor. Chronic malnutrition due to undernutrition is endemic with over a quarter of under-five children stunted. The impact of stunting can be devastating as apart from the risk of death during childhood, it can impair brain development and deter cognitive capacity leading to poor school-performance (SDG 4) – denying the nation the skilled labour force in the future.

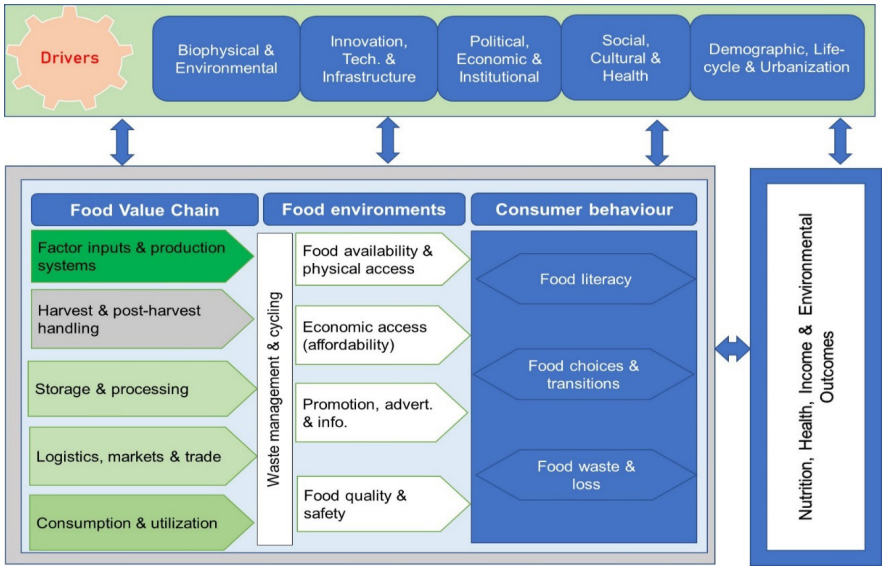
Nevertheless, undernutrition is prevailing together with increasing cases of overweight and obesity among children and women of reproductive age in both rural and urban areas. Moreover, there is evidence of a growing burden of diet-related non-communicable diseases. Hidden hunger entailing micro-nutrient deficiency is not an exception, it is widespread particularly among majority of the vulnerable children and women in reproductive age. Indeed, the Tanzania food systems have to address all forms of malnutrition including undernutrition, overnutrition and hidden hunger (micronutrients deficiencies) that span among the poor and vulnerable in both rural and urban areas.

Apart from climate change and other shocks such as pandemics, the Tanzania food systems are also shaped by other mega-trends: the confluence of urbanisation and rising income, and evolving food environments. These are reshaping eating habits and dietary transitions with varied nutrition and health consequences. Arguably, the voices heard and multi-stakeholder alliances forged under the UNFSS process is an impetus for re-imagining game-changing action pathways towards sustainable, resilient and equitable Tanzanian food systems.

3.2 Tanzanian food systems: major drivers and futures

The discussion on the discourse of development of Tanzania food systems is objectively organised by the sustainable food systems framework (Figure 1). However, the scope of this report and this section in particular cannot not address all the components of a sustainable food system. In this regard, a brief discussion sheds light on major drivers of the Tanzania food systems.

Figure 1: Sustainable food system framework



Source: Author's construction

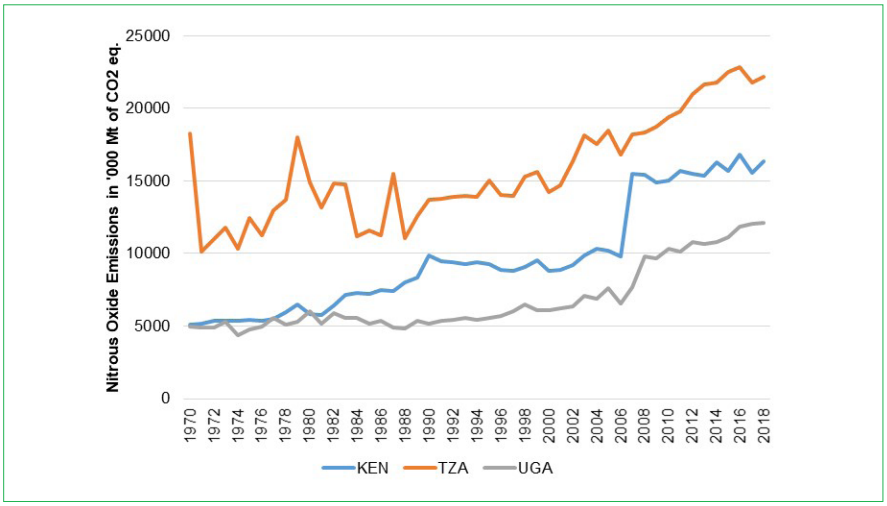
Biophysical & Environmental

Under this category, climatic and environmental changes are the major drivers of the food systems. Such changes will intricately trigger dynamics in other biophysical stresses such as pests and diseases, land and water resource degradation and scarcity. While climate modelling predicts around a degree of temperature rise in Tanzania by around the mid-century circa 2030, projections on precipitation are highly variable and uncertain over space (Derying 2015, Luhunga et al. 2018). An increase in the level of precipitation in the semi-arid central Tanzania in the circa 2030 (Tumbo et al. 2020). However, such increasing rains might fall in extreme patterns with seasonal shifts (Matata et al. 2019, Silungwe et al. 2019, Borhara et al. 2020). With new opportunity of elevated soil moisture, relatively high-yielding crops with higher moisture requirements over that of conventional dryland crops may be grown. Likewise, farmers might need to adopt drainage practices to manage excessive water from flooding the crop fields. Some

degree rise in temperature in historically cooler farming systems might create an opportunity for growing short-maturing crops but with reduced grain yields due to shortened crop life cycle. Generally, the opportunities associated with climate change are uncertain and highly localized while the net consequences at a national scale appear to be unbearable (Tumbo et al. 2020).

In the context of climate change, the food system can itself be a source of problem or a solution. Agriculture including unsustainable crop and livestock production, forestry and associated land use changes contribute up to 30% of global greenhouse gas emissions (Tubiello et al. 2012, Mutabazi et al. 2014). According to FAOSTAT emission database, the emission associated with expansion of rice production has increased 14 times in 2017 since independence in 1961 (268 to 3,818 gigagrams of CO2 equivalent). Likewise, during the same period, the emission due to use of synthetic fertilizers has increased by 75 times (9 to 84 gigagrams of CO2 equivalent). Within the EAC, Tanzania is ahead of Kenya and Uganda in terms of agricultural fertilizer linked nitrous oxide emissions (Figure 2). Tanzania is also leading EAC's member states in agricultural methane emissions that can also be associated with flooded paddy production, and unsustainable handling of manure and bio-wastes in the food systems. However, as vested in the FYDP III, the URT is determined to promote Climate Smart Agriculture and strengthen environmental conservation and protection in order to mitigate adverse effects of climate change (URT 2021).

Figure 2: Agricultural nitrous oxide emissions ('000 Mt of CO2 equivalent)



Source of data: World Bank's World Development Indicators, updated 15th September 2021

Innovation, Technology & Infrastructure

It is acknowledged through a common knowledge for decades that rural Africa faces formidable problems of poverty and malnutrition, inadequate farm yields, low use of fertilizers, certified seed, and irrigation, and often poor roads and other infrastructure (Reardon et al. 2013). Advancement in innovations, technology and infrastructure (ITI) is a game-changer in the transformation of the food systems. Deployment of science-driven technological innovations and better infrastructure that are climate and nutrition smart is key in upgrading different components of the food systems including the food value chains and food environments. Expansion of irrigation infrastructure and agricultural water management to boost food production is indispensable– as irrigated area accounts for only 4% of cultivated land. In Tanzania Mainland the target is to expand area under irrigation from the current 694,715 to 1,200,000 1.2 million hectares by 2025 (URT 2021). Upgrading ITI are also needed in the areas of improved seeds; breeds; fingerlings; good agricultural practices; nutrition and health sensitive food processing, storage; logistics and trade; and ultimately sustainable handling of wastes in the food systems. Expectedly, ITI will be advanced as integrals of development frontiers in computing and digital technologies, and R&D. All these development areas are evident targets in the Tanzania Mainland's FYDP III and Zanzibar Vision 2050.

Political, Economic & Institutional

Indeed, the political economy is central in shaping the performance of the food systems. Given the political party's supremacy in the Tanzanian context, the political economy direction towards sustainable development including food systems is largely guided by the ruling party's manifesto of 2020-2025 (CCM 2020). The development targets stipulated in the manifesto align with other planning documents including the FYDP III and other sectoral programmes such as Agricultural Sector Development Programme II (ASDP II). All six development areas contribute to the transformation of the food systems by 2025: 1) ensure good governance, equality, human rights, peace and national unity, 2) build a modern, inclusive and competitive industry-based economy, 3) transformation of agricultural sub-sectors (crop, livestock and fisheries) to ensure food security and contribution of the sector to the economic growth, 4) improve availability of services including health, education, clean and safe water, electricity and decent housing in rural and urban areas, 5) advance the use of research, science, technology and innovations as key drivers of fast-tracking social and economic development, and 6) create at least 8 million employment opportunities for the youth in formal and informal economic sectors.

However, such commitments will depend on, among other things, the budgetary resources that will be invested in respective sectors, particularly, agriculture. The agricultural sector's annual growth rate (around 3-5% over the past decade) is lower than the growth minimum target of 6% stipulated in the 2003 CAADP's pact of African member states and re-emphasized in the 2014 Malabo Declarations. The target is to have agriculture growing at an average of 6.1% by 2030. Thus, agriculture-specific spending averaged only 4% of total public spending and by 2017 had fallen to 2.5% (FAO MAFAP Database, September 2018 version), just one-quarter of the 10% CAADP commitment of AU member states (World Bank, 2019).

The private sector is positioned as an engine of economic growth including transformation of food systems. Financing the development missions vested in the FYDP III for Tanzania mainland and in the Zanzibar Vision 2050 would require attracting private sector investments. Out of the total budget of TZS 114.8 trillion needed to finance the FYDP III, about 35% (TZS 40.6 trillion) is expected from the private sector. This requires the government to create enabling environment to unleash such private sector investments – both domestic and FDIs. There is still more to be done in the political economy context to improve business environment and investment climate. The situation has not improved appreciably since the Blueprint of regulatory reforms for improving business environment was launched in 2017 (URT 2017). The latest "Doing Business" assessment report (World Bank 2020) ranks Tanzania 141 among 190 economies. Over the past 6 years from 2015 to 2020 the rank of Tanzania out of 190 economies regarding "ease of doing business" has averaged at 137. The FYDP III has set a target of improving the ease of doing business ranking from 141 to 95 out of 190 ranked global economies (URT 2021).

Social, Cultural and Health

Food systems have roots in societies and cultures – hence intricately linked with the social and cultural change. While a consensus seems to hold that a socio-culturally sound food system should enable societies to lead healthy and sustainable lives, the transformation pathways of the food systems remain widely contested. The tensional viewpoints come from the advocates of agro-ecology for food sustainable production, diversity, sovereignty and human rights vested in civil and social movements as solutions for building food systems that are just, equitable, and operate in planetary boundaries (Mooney et al. 2021). Social systems are an integral of food systems that are constantly shaped by mega-trends pushing them beyond "societal solutions boundaries". A balanced position is relevant to keep doors open for external solutions fitted in the local contexts to foster efficient, inclusive, resilient and sustainable food systems.

The institutions of the society may inequitably determine access to means of production and control of production. Tanzania is positioned 150th out of 160 countries in the 2019 Gender Inequality Index. The country displays significant gender disparities with women having access to fewer productive assets, particularly, finance and land. Women from some communities particularly pastoral and gatherers (e.g., Akie, Hadzabe, Barabaig and Maasai) tend to have little say in the decisions, difficult access to health education, to assets, land and income (IFAD, 2020). The gender agricultural productivity gap in 2015 amounted to USD 105 million (0.46% of GDP) and closing the gender productivity gap could lift some 80,000 Tanzanians out of poverty each year and eliminate malnourishment in the same number (World Bank, 2015). Thus, rising awareness and regulating against such socio-cultural inequalities is pertinent.

Health is both the driver and outcome of food systems as has been proven by the COVID-19 pandemic. Health is the basic human capital needed to sustain the food systems. Healthy workforce supports food production. Unhealthy food system undermines health leading to morbidity and mortality. Pandemics can undermine food systems through disruptions of the food supply chains, food trade logistics, closures of learning institutions and schools, economic melt-down that affect economies of countries and citizens, and ill health consequences of lockdowns. The impact of COVID-19 on the Tanzanian economy is reflected by the 2% drop from a decade-long economic growth rate of 6-7%. The government has rolled-out COVID-19 related economic recovery measures in terms of fiscal and monetary policies. Public interventions in the health sector include investments in infrastructure, training of health professionals, medical equipment and supplies, reagents, medicines, curative and preventive care, and health insurance (URT 2021).

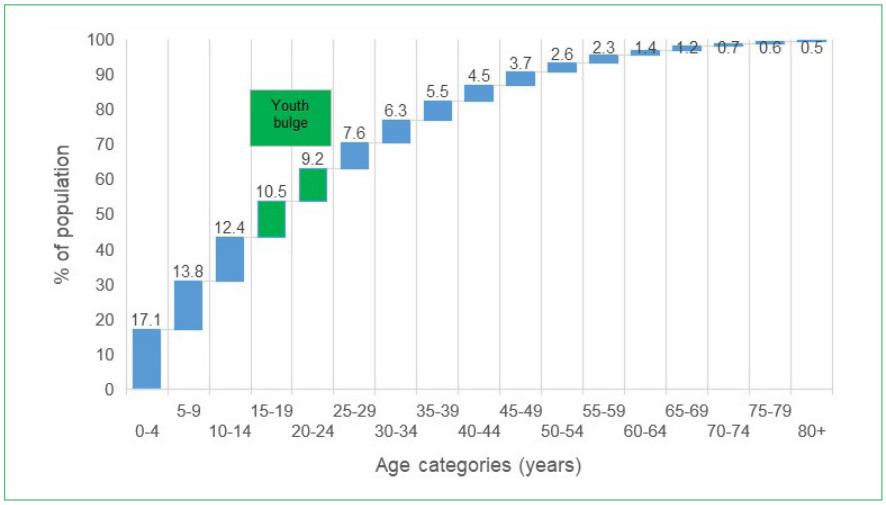
Demographic, Life-cycle & Urbanisation

The demographic structure and dynamics have implications on the futures of food systems and sustainable development at large. Population growth means more mouths to feed, rising demand for productive resources, pressure on infrastructure and increased public expenditure on social services such as health and education. In 2020, the URT had a total population of 57.6 million people (URT 2021a). Around 800,000 people are added to the potential labour force every year (Agwanda and Amani 2014) most of them being youth. Tanzania is experiencing a youth bulge with the population aged 15-24 years accounting to about 20% (Figure 3) of the total population in 2020 (URT 2021a). Tanzanian median age is estimated at 17.7 years – hence among the youngest countries in Africa. Tanzania might enjoy the demographic dividend if this youthful workforce is harnessed

through investment in human capital and creation of opportunities for decent jobs. Expectedly, youths are expected to play a big role in fostering sustainable food systems for foreseeable future as children aged between 0 and 14 years account for 43% of the total population. Transformation of the systems across all facets of the food value chains including services in the agri-food sector provides an avenue for job creation among the youth. The government has developed a dedicated strategy to guide involvement of youth in agriculture (URT 2016) and in other sectors of the economy as stipulated in the FYDP III. Furthermore, due to their affinity to smart-technologies, youth can be catalytic actors for advancing digitisation of the food system that if used prudently can ensure inclusivity, efficiency and sustainability (Deloitte 2020[1]).

Moreover, the youth bulge would have another effect on dietary habits and transitions as entailed in life-cycle related consumption behaviour. Youths particularly those in towns and cities may be indulged to eating unhealthy convenient cheap foods likely on street culinary outlets. Most street foods consumed in Tanzania tend to be calorie-dense, fatty and sugary (Marras 2018). Given growing importance of street foods in towns and cities, urban development plans must regulate and accommodate the sector to make such culinary outlets are serving hygienic, safe and healthy foods.

Figure 3: Tanzanian age structure in 2020 showing youth bulge



Source: URT 2020, Economic survey 2020

1 https://www2.deloitte.com/content/dam/Deloitte/gr/Documents/consumer-business/gr_Transforming_Agriculture_through_Digital_Technologies_noexp.pdf

Furthermore, urbanisation coupled with rising income are driving and will continue to shape the futures of food systems (Jayne et al. 2014). By 2050, more than 50% Tanzanians will be living in cities. The significance of Tanzanian food systems to nourish the growing cities with quality, healthy and affordable foods will be growing. Thus, the challenge of feeding Tanzanian population will be the challenge to feed cities and towns. Both urbanisation and income growth will consequently trigger shifts in food demand and downstream modernisation of the food systems (Tschirley et al. 2013). However, Tanzanian urbanisation as in the case of other African countries is highly decentralised with secondary and rural towns making up most of the urban population compared to mega-cities (above 1 million population). According to Reardon et al. (2015) such decentralisation urbanisation can be more effectively interface with surrounding rural areas to provide for non-farm employment and agricultural market outlets to benefit rural development.

3.3. Development landscape of Tanzanian food systems

Tanzania is also a member of some Regional Economic Communities (RECs) with mutual agreements and frameworks of cooperation in social, economic, political and environmental contexts. Such RECs include the East African Community (EAC with 6 member states) and the Southern Africa Development Community (SADC with 16 member states). Both EAC and SADC have visionary development roadmaps by 2050 that imply on sustainable food systems and SDGs. The development areas addressed in these visions include infrastructure development, agriculture food security and rural development, industrial development and market integration; and environmental and natural resources management.

At the national level, the visionary development futures are narrated in the Tanzania Development Vision (TDV, 2025) and Zanzibar Development Vision (ZDV, 2050). Such long-term development visions are implemented through various programmes and the 15-year Long-Term Perspective Plan (LTPP, 2011-2026) rolled out in three phases of the Five-Year National Development Plans (FYDPs) including terminal third FYDP (FYDP III, 2021-2026) being implemented currently for Tanzania mainland. Such frameworks and related to sectoral actions (incl. policies, strategies, programmes, plans, instruments and institutions) are aimed at advancing development goals of building a sustainable competitive and industrial economy for human development through enhanced sustainable growth, blue economy, competitiveness, industrialisation and services, trade and investment and social development. The recently launched process to develop the National Multi-Sectoral Nutrition Action Plan (NMNAP II, 2021–

2026) presents an excellent opportunity to better integrate a multi-sectoral food systems approach to improving diets and nutrition.

Sustainable industrialisation (URT 1996, URT 2011) that is largely dependent on supplies of raw materials from agriculture and food systems remains a central driver of a competitive and inclusive economic growth. The Tanzania Agro-Industry Development Flagship (TAIDF) programme seeks to increase total GDP by 5% and add the contribution of the agro-processing to 12% of GDP, create 1 million jobs (mainly women and youth) with new employment opportunities by 2025, which will have a positive impact to over 7 million households directly or indirectly (URT 2020a). However, there are inadequate frameworks and mechanisms for effectively enforcing green industrial technologies that curb carbon footprints and pollution. Existing environmental policy and legal frameworks are set at a national level and do not fully account for differentiated local contexts hence lacking tailored incentive structures and sanctions that ultimately affect effective implementation.

Effective transformation of agriculture and the food systems it drives would require adequate financial investments by both the public and private sectors. Tanzania has a very high discrepancy between approved budgets and disbursed funds: 83% for recurrent agricultural budget spending in 2017/18 and only 6% for development spending. Budget and monitoring problems hinder disbursement also at the local government level (World Bank 2019).

The third Five-Year Development Plan (FYDP III) will be a decisive planning document for advancing development towards 2025. The sectoral development directions, actions and budgetary investments are articulated in the sector budget plans in a particular fiscal year. The sector plans and budgets are consolidated into the national budgetary plan and the financial bill as an instrument to implement it. Over recent years, environmental and climate change actions are increasingly addressed under the concept of green growth. Sustainable management of natural resources including forest, rangelands, water, marine and land critical for sustainable development. Food and nutrition security related targets by the year 2025 include reduction of: stunting rate from 32 to 24%; proportion of anaemic women in reproductive age from 44 to 22%; and percentage of population accessing iodized salt from 62 to 80% (URT 2021b).

Imparting resilience of food systems would require robust risk management strategies including agro-insurance products tailored to the needs and conditions of smallholder farmers and agri-food SMEs. Only 6% of adult population in Tanzania have access to insurance (URT 2021b). The share

of agricultural insurance is very infinitesimal of the overall insurance portfolio. The game-changing path to de-risk, upgrade and build resilience in smallholder agriculture would require an integrated financing model that strategically combine agri-insurance, credit guarantees and deployment of proven adaptation technologies.

The FYDP III is vowed to advance digitisation across difference economic sectors including agriculture. Digital agriculture such as Precision Agriculture (PA) and Artificial Intelligence (AI) would play a big role towards advanced, sustainable, competitive and inclusive food systems. Digital technologies can be used to improve precision of management of soils, rangelands and fish stocks. PA can be used to carry out variable rate application of fertilizers and agro-chemical to optimise production, save costs and preserve the environment excessive application rates. AI can also be used in crop protection through smart detection of pests and diseases – and effective application regime of appropriate control chemicals. Combination of AI, geospatial and carrying platforms such as Unmanned Aerial Vehicles (UAVs) can be used to assess performance of crops, livestock and fisheries over time and space. Strategic pathways to support digitisation of agriculture include (Fue and Mutabazi, 2021): strengthen coordination and co-innovations in applied digital R&D; promote investments in seed funding and investments in agTech start-ups; and promote taxation regimes that make imported PA designated technologies affordable.

Tanzania is endowed with resource-rich fresh and marine waters as the foundation of blue economy currently driven by the fisheries and seaweed farming. Fisheries include fresh water, sea and deep-sea and aquaculture fishing. Fisheries contribute 1.8 and 4.8% of the overall GDP in Tanzania mainland and Zanzibar, respectively. In Tanzania mainland, the target is to increase the fisheries GDP share to 8.4% its contribution as animal protein intake by 5% from the current level of 30%. In Zanzibar, fisheries contribute over 90% of animal sourced protein (URT 2021b, RGoZ 2020). Development interventions in the fisheries sector include procurement of fishing vessels and construction of fishing harbours; ensuring fish and fishery products quality, safety and standards; fishery value addition infrastructure; and resource conservation.

The agriculture links with nutrition and health sectors through food production, agri-food markets, farm income generation for enhanced access to nutritious and healthy foods. Such linkages are underscored in the Nutrition-Sensitive Agriculture Action Plan (NSAAP). Agriculture is fundamental in sustaining rural and urban food systems. Apart from delivering food through localised self-provisioning and rural agri-food markets, rural food systems support urban food supplies. Despite of being

main producers of foods, rural farming families spend about 70% of their income on food (URT, 2013). Thus, rural food systems are fundamental in sustaining provision of affordable, safe and nutritious. Eco-efficiency in food production is the stepping stone towards sustainable food systems that deliver adequate food supplies, keep food prices affordable and remunerate operators through profitable returns on investments.

4.0 ROADMAP TO SUSTAINABLE FOOD SYSTEMS: FROM ACTION TRACKS, DIALOGUES TO PATHWAYS

4.1. An overview and vision statement

As a nation, the United Republic of Tanzania (URT) appreciates the food systems transformation initiatives and joins coalitions and partnerships to transform food systems to realise Sustainable Development Goals, 2030. In preparation for the UN Food Systems Summit, Tanzania's Ministry of Agriculture in collaboration with the sector lead ministries, UN Agencies, International and Local NGOs convened at community level, sub-national, sectorial and national food system 12 dialogues. Guided by principles of engagement, these dialogues enabled diverse participants to work together on exploring challenges and options to transform food systems in a manner that contributes to the realisation of the vision of the 2030 Agenda for Sustainable Development in the Tanzanian context. In the process of engagement, the sub-national and national dialogues, background papers and the Annual Agriculture Policy Conference (AAPC) evaluated the current state of URT Food Systems and identified the key challenges and solutions that need to be addressed to drive transformation.

Vision Statement to national pathways to sustainable food systems

By 2030, all Tanzanians will have access to healthy diets and safe food, focusing on life-cycle, and address all forms of malnutrition. Sustainable food systems will nourish United Republic of Tanzania's population, strengthen local production and distribution, generate competiveness for industrialisation, offer equitable livelihoods, be resilient to vulnerabilities, shocks and stresses, steward the biodiversity, and help mitigate and adapt to climate change by shifting the food systems towards green growth.

This vision will be achieved by 2030, by concretising investment in access to affordable technologies and digitalisation, infrastructure, health and nutrition services, education, and ensuring that agriculture and food value

chains are diverse and productive, sustainable, support healthy diets, contribute to realizing competitiveness and industrialization for human development. Major drivers for transformation of agriculture and food systems in URT lie in harnessing science, innovation and digitalisation, affordable technologies and investment in infrastructure development with inclusion of smallholder farmers and agribusinesses. Guided by principles of engagement, these dialogues enabled diverse participants to work together to explore challenges and options to transform food systems in a manner that contributes to the realisation of the vision of the 2030 Agenda for Sustainable Development in the Tanzanian context. In the process of engagement, the sub-national and national dialogues, background paper and the Annual Agriculture Policy Conference (AAPC) evaluated the current state of Tanzania's food systems and identified the key challenges and strategic solutions that need to be addressed to drive transformation.

The dialogues were effective inclusive platforms where visions and voices of a spectrum of stakeholders were harnessed to inform the futures and pathways to Sustainable Food Systems and SDGs at large. Six specific levers of food systems transformation were identified:

1. Production and productivity in crop, livestock and fisheries sub-sectors;
2. Financing of agriculture and private sector involvement in the food systems;
3. Nutritious, healthy and safe food diets for all and school feeding programmes;
4. Climate change mitigation, adaptation and biodiversity protection;
5. Resilient food systems and livelihoods; and,
6. Sustainable food systems enablers including ICT, gender, environment, equity, R&D and political economy.

These six specific priority issues were further prioritised into game-changing actions underlying the pathways to sustainable food systems. The pathways are formulated in the result-format entailing the intended outcomes once the pertaining critical issues are addressed. The pathways are underlying by the rationale for the critical issues to be addressed and actions needed to transform the food systems into desired futures by 2030.

4.2. Sustainably improved food production and productivity [Action Tracks 1,3,4,5]

4.2.1. Rationale of the pathway

The considerable growth of Tanzanian agriculture that has been in the range of 3-5% over a decade has been due to expansion of cropped area rather than increasing productivity in a sustainable manner. Productivity of food crops including cereals and grain legumes particularly in semi-arid dry land areas is about a tonne per hectare. The yield gaps in terms of current versus potential yield levels are high – up to for 4 tonnes per hectare in cereals. In most areas including fragile agro-ecosystems such as semi-arids and sloppy mountains, farming still involves unsustainable slash-and-burn practices with limited soil and water conservation. Due to unsustainable farming practices and inadequate fertilisation, more than 60% of the land used to produce crops, livestock and forest products is degraded (World Bank, 2019). Productivity of agricultural land is limited by inadequate use of appropriate fertilizers, land degradation and soil health problems. Growing incidences of pests and diseases whose dynamics are increasingly altered by climatic and environmental changes contributing to crop failure and food insecurity (FAO and TFS 2020).

Likewise, livestock productivity levels in terms of weight gains, production of milk and eggs are low. Low productivity in livestock is attributed by low genetic potential of indigenous breeds. Indigenous cattle, produce about 2-4 litres of milk per day compared to improved dairy cattle which produce about 8-12 litres per day (URT 2021c). Likewise, it takes 4 years for indigenous cattle to reach a weight of 250 kg, while for improved breed it takes 2-3 years to reach 550kg (URT 2021d).

Unsustainable fishing practices like use of restricted gears in both marine and fresh waters still exist. Inadequate facilities in the fisheries sector inhibit fishers to reach deep sea where the catch can be done at a large scale. The target for Zanzibar is to increase fish production from 36,728 (2019) to 44,450 tonnes through deep sea fishing and cage farming per year. The blue sector provides also seaweed farming for Zanzibar. The seaweed sub-sector target is to increase production from 16,723.8 (2020) to 21,000 tons by 2025. This outcome will be attained by empowering seaweed farmers through training and provision of planting material to grow the valuable crop. Production failures mainly due to droughts and outbreak of pests and diseases are not uncommon–and are exacerbated by climate change.

Thus, upgrading productivity of crops, livestock and fisheries is critical for sustainable food systems in the country by 2030.

4.2.2. Potential game-changing solutions

Concretise investment in locally adaptive innovations and access to affordable technologies and digitalisation; ensuring equitable access to land and water resources; increase investment in infrastructure (irrigation canals, rural roads, fishing, storage and processing facilities); increase public–private investment in local seeds, semen, animal breeds and fingerlings production; expansion of access to extension and advisory services; strengthening producers' skills and creativity; diversified and nutrition focused production; integrated diseases and pest management; promote precision and climate smart agriculture; strengthen soil testing services and conservation of land and water resources; and improving availability of fishing equipment and technologies for the fishers access deep sea for optimal catch.

4.2.3. Milestones by 2030

→ **Milestone 2025:**
Improved infrastructure, digitalisation of agriculture, increased access to affordable climate-smart technologies and farm inputs.

→ **Milestone 2030:**
Improved production and productivity contributing to food security, competitiveness and industrialisation of the economy.

4.3. Increase financing of agriculture and private sector engagement in food systems [Action Tracks 1, 2, 3, 4, 5]

4.3.1. Rationale of the pathway

Upgrading of food value chains for improved productivity, nutritional quality, safety and standards, would require financing which is not in the means of many small-scale farmers, fishers and agri-SMEs that lack collaterals. Financing is critical for accessing better technologies and innovations needed to sustain agri-food systems. Financing of food value chains entails both credit and insurance – the latter being critical in risk management while at the same increasing the prospects for credit qualification and repayment. Lending interest rates are prohibitively high (up to 17% in commercial banks). Despite of mounting risk, agricultural insurance is still unpopular among smallholder farmers due to a number of factors including– untailored design of product, inability to afford premiums, and socio-cultural issues. Women, youth and people with disabilities tend to be disproportionately the most financially excluded segments of the population. The business

environment to unleash private sector investments in the agri-food sector needs further improvements as stipulated in the national blueprint of regulatory reforms for improved business environment (URT 2018). In this respect, increased financing of agriculture and food value chains is direly needed to upgrade food value chains hence transform the food systems.

4.3.2. Potential game-changing solutions

Strengthen the capacity of the Tanzania Agricultural Development Bank (TADB) to scale agricultural finance and farmers' cooperatives; embark on formalisation of land and livestock assets as a collateral; promote credit guarantee schemes to improve lending to smallholder farmers and fishers; strengthen block and contract farming systems; support schemes for agribusiness off-takers, improve business environment and investment climate in agriculture and food systems by implementing reforms stipulated in the blueprint of regulatory reform for improved business environment.

4.3.3. Milestones by 2030

→ **Milestone 2025:**
Improved policy environment supporting agriculture financing and agribusiness environment; rollout tailored made credit schemes and insurance facilities to support agribusinesses in the agri-food industry.

→ **Milestone 2030:**
Improved agriculture financing schemes; improved business environment for a vibrant private-sector driven agri-food sector; increased competitiveness of crop, livestock and fisheries sub-sectors.

4.4. Ensure nutritious, healthy and safe food diets for all [Action Track 1,2,3,5]

4.4.1. Rationale of the pathway

Despite of an impressive food self-sufficiency ratio (>120%), the country still faces a triple-burden of malnutrition envisaging undernutrition, overnutrition and hidden hunger. At national average, overweight and obesity inflict about 32% of women in reproductive age (TNNS 2018). Urban areas carry more burden overweight and obesity than rural counterparts accounting for 42% and 21% of women in reproductive age, respectively. Likewise, population in the highest wealth quantile are more affected with overweight and obesity (47%) than those in the relatively poorer bracket (12%) (TDHS 2016). Stunting rates for under-five children stand at 32%. Feeding practices are also sub-optimal, with only 30% of children below five years of age fed

the minimum acceptable diets (TNNS 2018). Dietary transitions and habits towards increased consumption of sugary beverages, starchy, fatty, and ultra-processed foods have contributed to the overnutrition problem and associated diet-related Non-Communicable Diseases (NCDs).

Diets of many rural and urban families are generally lacking diversity, and nutritious diets remain unaffordable for the majority. Arguably, both food production and marketing systems are not guaranteeing access to nutritious, healthy, safe and affordable food to all and all the time. Most of agricultural interventions for increased food production are rarely nutrition-sensitive. Such interventions have been on promoting production rather than improvement of equitable access to nutritious and safe food. Bio-fortified nutrient-dense crop varieties and micro-livestocks are not adequately promoted. The feeds and forage resources fed to animals and farmed fishes are of poor quality undermining nutritional quality of animal products produced for human consumption.

Clean drinking water, acceptable hygiene and sanitation services (WASH) are still inaccessible to many households. Improved hygiene in fish handling is important. Fishes are pulled from the fishing boats and dragged on the sand. Drying of anchovies is done on unhygienic sand surface hence reducing quality of the fish. The government of Zanzibar plans to build anchovies processing industry to ensure good quality and healthy anchovies as wells as to reduce post-harvest losses by 2025 (RGoZ 2021).

Furthermore, injudicious use of pesticides and emerging issues of mycotoxins (aflatoxin) especially in maize and groundnuts are emerging threats in the Tanzania food systems. Consumer food and nutrition literacy is still limited hence undermining healthy eating practices and habits. Food emergency and assistance systems through social protection for the most vulnerable are inadequately coordinated and targeted. Moreover, effective delivery of healthy and safe food diets to all is multi-sectoral hence requiring efficient coordination mechanisms that are currently inadequate. In this regard, undertaking strategic actions that ensure access to diverse, safe, healthy and locally available nutritious food is central in the transformation of Tanzanian food systems by 2030.

4.4.2. Potential game-changing solutions

Healthy diets are to be made more available and accessible through improved agricultural productivity and diversification; strengthening of nutrition-sensitivity of local production systems and supply chains; raising of small animals and aquaculture at community levels; commercialisation of nutrient dense-bio fortified crops; promotion of home-grown school feeding programmes; infrastructure improvement in territorial food

markets, storage and agro-processing industries; home-based and large-scale food fortification; involvement of private sector support in school feeding programmes; coordinated and well-targeted food emergency and assistance to the most vulnerable; strong linkages between food producers and consumers; through capacity-building and outreach of agriculture extension and rural health systems promote maternal and child counselling and services healthy feeding practices as stipulated in the NMNAP II (National Multi-sectoral Nutrition Action Plan II); ensure access to clean drinking water, sanitation and good hygiene practices; awareness creation for aflatoxin control; develop and enforce regulations on labelling in the food markets to inform consumer choices for healthy foods; implementation of National Dietary and School Feeding Guidelines, increase investment in implementation of NMNAP II 2021-2026 for both Tanzania Mainland and Zanzibar; implement actions outlined in the improving child diets framework; strengthen governance of nutrition interventions at all levels; and rollout well-targeted campaigns and exhibitions to promote nutrition-sensitive consumption habits such as milk consumption week, nutrition week, and world food day.

4.4.3. Milestones by 2030

→ Milestones 2025:

The URT has implemented the FYDP III which provides a wider national vision towards improving food and nutrition hence contributing to delivery of the sustainable development agenda. Likewise, the second NMNAP II implemented to address the triple-burden of malnutrition across the life-cycle and guide all the nutrition specific and sensitive interventions across different facets of development. Mainstream nutrition in plans, strategies, programmes and projects across sectors including agriculture. Implementation of the Nutrition Sensitive Agriculture Action Plan (NSAAP 2021-2026), which is in the final stage of development. Finalise and implement the School Feeding Guidelines for the school feeding programmes. Moreover, promote healthy food markets and eateries will be facilitated to demonstrate food safety and promote diverse, healthy diets with support from private sector, local governments and consumer communities.

→ Milestone 2030:

Improved access to nutritious, healthy and safe food diets to all through implementation of health and nutrition sensitive plans across agriculture and health sectors; rolling out home-grown sustainable school feeding programmes; promote healthy food environments including inclusive urban planning that ensures healthy street foods and eateries; promote nutrition and health responsible private sector

investments in the agri-food sector; scale-up well-targeted campaigns and exhibitions to promote nutrition-sensitive consumption habits such as milk consumption week, nutrition week, world food day; and well-coordinated and targeted food emergency and assistance systems to safeguard livelihoods of the most vulnerable.

4.5. Climate change mitigation, adaptation and biodiversity protection [Action Tracks 4]

4.5.1. Rationale of the pathway

The impacts of climate change and variability in Tanzania are eminent – on climate sensitive sectors including agriculture, water, health, energy, aquaculture, blue seaweed farming and food systems. Climate change manifests as the most dominant environmental threat to different marine-based livelihood sources including seaweed farming (Msuya 2011). Rising sea temperature poses threat to seaweed farming in Tanzania. Drought-related production losses for major food crops are estimated at annual average of US$ 164 million and estimated to increase to over US$ 300 million per year by 2030. The investment needed to build resilience in the agriculture sector against future climate change amidst development deficit is estimated at US$ 9.1 billion by 2030 for investing in irrigation, soil and water conservation, research, extension and rural roads (Tumbo et al. 2010, Watkiss et al. 2011).

Biodiversity loss and degradation is alarming hence threatening the flow of related ecosystem services that greatly support food systems. The toll of climate change and variability, and biodiversity loss is unprecedented in dryland semi-arid areas with already fragile agro-ecosystems and related food systems – rendering dryland agrarian families vulnerable to poverty and food insecurity. The notion of "leaving no one and no place behind" as food systems advance into sustainable futures is arguably relevant in the context of Tanzanian semi-arid drylands. Nearly a half of Tanzania is characterised by dry semi-arid to sub-humid drylands experiencing low and erratic rainfall, high potential evapotranspiration, and extreme weather events. The coverage of Tanzanian drylands is expected to expand with future climate change that will re-zone the country's agro-ecology. Thus, addressing climate change impacts through mitigation and adaptation actions, and harnessing the integrity of biodiversity for sustained flows of ecosystem services is critical for sustainable food systems and green growth at large.

4.5.2. Potential game-changing solutions

The United Republic of Tanzania is undertaking a number of measures geared to addressing harmful impacts of climate change while imparting vibrancy and resilience to the national food systems. Such initiatives include public investments in energy and public transportation sectors. The Government has initiated the Julius Nyerere Hydropower Project that will produce 2115MW upon its completion. Rural Electrification Project is another initiative with the aim of increasing access to electricity to 100% by 2025. These projects will help in reducing emission from deforestation as currently 80-90% of domestic cooking energy in Tanzania comes from biomass energy. The Government is investing in public mass transportation systems that will contribute to reduction of carbon footprints: the construction of a Standard Gauge Railway (SGR) of 1,457kms from Dar es Salaam to the shores of Lake Victoria and Rapid Bus Transport System in the Dar es Salaam Megacity. The government has also scaled up conservation efforts of biodiversity through sustainable management of forestry, wildlife and wetlands. Each year, the Government targets to plant 276 million trees through Local Government Authorities (LGAs). For monitoring purposes, the Government has established the National Carbon Monitoring Centre (NCM) which is mandated to build national capacity to measure, verify and report adequately on national carbon emissions.

4.5.3. Milestones by 2030

→ Milestone 2025:

The URT scaling-up implementation of climate change related actions and commitments entailed in a number of international frameworks and conventions: the 2015 Paris Agreement; UN's SDG 13 and other related SDGs such as 1, 7, 12, 14, 15, 16 and 17; Agenda 2063 on the Future Africa We Want; and Sendai Framework on Disaster Risk Reduction. At national level, climate actions are also implied in different planning documents including the National Climate Change Strategy of 2012, CCM Election Manifesto of 2020, Third Five Year National Plan (2021-2026), National Climate Change Response Strategy (2021), the Zanzibar Climate Change Strategy (2014) and Climate Smart Agriculture (CSA) Programme (2015- 2025). These frameworks which elaborate adaptation measures and mitigation actions that are deemed necessary to address climate change in the country. They also set stepping stones and building blocks towards mobilisation of climate change finance for addressing climate change.

→ Milestone 2030:

URT through the Nationally Determined Contribution (NDC) has set the target of reducing 30 – 35% of greenhouse gases emission by

2030. In implementing this, the Government has critically selected forestry, energy, transport and waste management as priority mitigation sectors to contribute to the reduction of greenhouse gases emission. Adaptation initiatives include sustainable agriculture, livestock, coastal, marine and fisheries, investment in infrastructure, tourism, health and capacity building.

4.6 Resilient food systems and livelihoods [Action Tracks 4]

4.6.1. Rationale of the pathway

Agricultural production, which is the lifeblood of the Tanzanian food systems, is mostly rainfed, hence, vulnerable to the vagaries of weather. Irrigated area accounts for less than 2% of total areas that can be put under irrigation. The weather-sensitive rainfed agriculture supports the livelihoods of over 80% of rural agrarian families and supplies most of the food consumed in the country. While Tanzania commands a diverse agro-ecologies favouring production of diversity of foods, spatial movements of foods from surplus to deficit areas are curtailed by poor market infrastructure, costly transportation and logistics, and asymmetric market information. In the recent past, sporadic food export bans in the plea to safeguard domestic food security and unpredictable regional food trade have been undermining increased investment in food production – hence undermining the food security in the long-run. Underpinning how the COVID-19 impacted the Tanzanian food systems and the economy at large is indispensable to inform how to build better futures from the pandemic and withstanding similar future shocks. Global disruptions of inputs supply chains affected local availability and costs of imported agricultural inputs. Export trade of agricultural commodities and fisheries commodities were halted due to disruptions in global logistics and falling demand in destination markets due to lockdowns and economic meltdown. Zanzibar was not only affected through the total shutdown of international tourism which accounts for more than a half of it GDP, but the blue export economy was also affected. The exportation of marine products entailing seaweed and fish dropped from 20,846 tonnes in 2019 to 12,714 tonnes in 2020. Collapse and downturn of international tourism, food and hospitality industry affected the agri-food industry particularly horticulture and poultry meat sub-sectors. These impacts contributed to loss of income to farmers and agribusinesses, and government revenue through related taxes. As a result of the pandemic, the Tanzanian economic growth dropped by 2% in 2020 from the pre-pandemic growth rates of 6-7%. Indeed, the pandemic

is already pushing the 2030 sustainable development targets further away. Thus, the path to sustainable development requires forging food systems and livelihoods that are resilient to shocks and disruptions.

4.6.2. Potential game-changing solutions

URT will continue to build on experiences to address vulnerabilities and poverty and to strengthen the resilience of food systems, networks and infrastructure to shocks and stresses including pandemics; strengthen Tanzania's Food and Nutrition Security Information System (MUCHALI) and Zanzibar Food Security and Nutrition Monitoring Early Warning System (ZFSNIEWS); advance disaster risk surveillance and early warning systems for timely mitigation, response and recovery strategies; integrate adaptation, disaster risk reduction and social protection to build long-term resilience of vulnerable communities and systems; maintain sustainable food reserves; increase provision of drought resistant crops; implementation of project on reversing land degradation trends and increasing food security in degraded ecosystems of semi-arid areas of central Tanzania by the Department of Environment under Vice President's Office and other partners including the International Fund for Agricultural Development (IFAD); promote private sector responsible investments in sustainable food systems; avail well-targeted comprehensive stimulus package to support the food systems recovery from COVID-19 pandemic; enhance agro-ecological transformations; promote eco-efficiency in the food systems; reducing waste and food losses by implementing the post-harvesting management strategy (2018-2027); increase renewable energy uses; and promote circular economy to optimize the food systems.

4.6.3. Milestones by 2030

→ **Milestones 2025:**

The competitiveness of food value chains and smallholder livelihoods will be enhanced through improved market linkages. Health and social protection systems will be reinforced throughout the country and information systems will be integrated (for improved targeting, shock-responsiveness, awareness raising and communication). Food reserves will be maintained to prepare for future disasters, at the household and national levels. Infrastructure, including irrigation canals, climate and nutrition smart processing and storage facilities, and agri-food trade systems will be strengthened across the food systems.

→ **Milestone 2030:**

The resilience of households and food systems to future climate and human induced shocks and stresses will be strengthened through

improved livelihoods; strengthened food value chains and markets; health and social protection systems; and investments in climate resilient infrastructure will be expanded.

4.7. Sustainable food systems enablers including ICT, gender, environment, equity, R&D and political economy [Action Tracks 1,2,3,4,5]

4.7.1. Rationale of the pathway

The cross-cutting issues include and are not limited to only these – the ICT, gender, the environment, equity and R&D. ICT and digital technologies are key in transformation of food value chains and the food system at large. Precision agriculture technologies increase efficiency in the use of productive resources such as water, seeds, fertilizers and agro-chemicals – hence not only saving costs of production but protecting the environment from excessive use of chemical inputs. Digitilisation has transformative applications in the agri-food systems beyond production including smart-storage, processing, digital marketing and nutrition information access.

Gender mainstreaming remains topical in the transformation of Tanzania food systems. The URT displays significant gender disparities with women having access to fewer productive assets, particularly finance and land. The gender agricultural productivity gap in 2015 amounted to USD 105 million (0,46% of GDP) and the closing of the gender productivity gap could lift some 80,000 Tanzanians out of poverty each year and eliminate malnourishment in the same number (World Bank 2015). The largest younger population, below 25 years of age (63%), needs to be harnessed through provision of better education, nutrition and health to be able to tape this demographic dividend. Gender and social equity are critical to ensure inclusivity of vulnerable groups such as women, youth and people with disabilities. In the context of Malabo Declaration, AU member states are committed to create at least 30% of jobs for the youth through investments in agricultural value chains.

Agricultural Research for Development (R&D) is lever for driving sustainable food systems through technological innovations. However, Tanzania is currently investing far less than 1% of its GDP in its overall R&D. Economic empowerment of women can be attained by supporting food value chains that are women-based such as seaweed production. In Zanzibar, about 80% of seaweed farmers are women who need more efficient production technology to increase production, productivity and profitability. Supporting women to access value adding technologies and

markets for value added products will also upgrade the levels of returns and local employment multipliers. Political economy entails policies, regulations, politics, and governance that determine allocation of public resources, and development process and outcomes. Such cross-cutting issues are pertinent in the transformation of the food systems under the auspices of the agenda 2030 of sustainable development.

4.7.2. Potential game-changing solutions

Fast track legal framework for protection of agricultural land; effectively implement policies, strategies and plans that address climate change; promote sustainable circular economy in the rural and urban food systems; promote gender mainstreaming in policies and plans; mainstream nutrition in agricultural policies, strategies and programs and action plan; design economic incentive structures and legal frameworks to promote nutrition-sensitive agro-processing sector; promote the use of ICT and digitisation of agriculture including food security monitoring, assessment and planning; improve safety and security of fishers through supporting proper fishing and safety gears, and maritime surveillance and patrols; review the national food and nutrition policy of 1992; and restrict marketing that promotes unhealthy diets through policy and fiscal instruments such as mandatory limits and taxes on advertising of unhealthy diets such as ultra-processed foods.

4.7.3. Milestones by 203

→ **Milestones 2025:**

Mainstream ICT, gender inclusivity, environmental sustainability, socio-economic equity and R&D across different action pathways towards sustainable food systems and sustainable development agenda by 2030. Harness a political economy environment envisaging policy, regulatory and organizational frameworks and reforms that support sustainable food systems and development.

→ **Milestone 2030:**

Cross-cutting issues mainstreamed in all pathways to sustainability of both future food systems and development at large. Strengthen international diplomacy, fulfil global commitments and forge partnerships to advance the common sustainable development course for prosperity of humanity and while sustaining the integrity of the planet.

5.0 SUSTAINABLE FOOD SYSTEMS' STAKEHOLDERS: AN INITIAL MAPPING FROM THE DIALOGUES

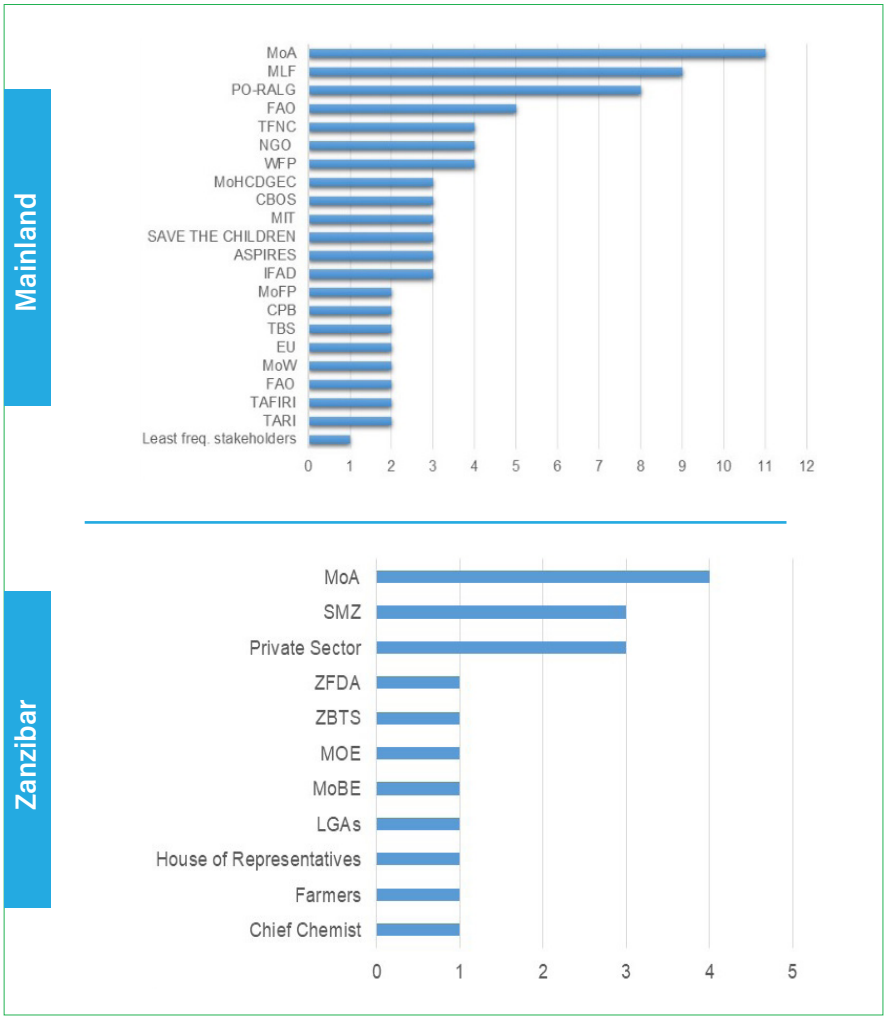
Notably, the UNFSS's Action Tracks (ATs) were not meant to prescribe but rather to stimulate open but guided multi-stakeholder dialogues. The stakeholders listed actions (solutions) needed to address each AT and key stakeholders for each action (see Appendix 1). Such actions ultimately informed the development of game-changing solutions underlying pathways to sustainable food systems. Although, such simple listing of stakeholders is rather abstract as far as a systematic process of stakeholder analysis and mapping is concerned, accounting for key stakeholders is a steppingstone for that process. Frequency analysis was done to underscore the relative importance of a stakeholder across an array of solutions required to address each AT. However, the frequency analysis can indicate the importance of the stakeholder, but a thorough analysis is needed to underpin the power and influence of each. The least mentioned stakeholder can be a powerful action that if not strategically engaged can fail the intervention. Likewise, the frequently, mentioned may have little influence to the extent that the engagement can only be passive. The results are presented separately for Tanzania Mainland and Zanzibar.

5.1. Key stakeholders for ensuring access to safe and nutritious food for all (AT 1)

The basic strands of this action track included achieving zero hunger, increasing access to affordable, nutritious and safe foods; increasing food safety; and, ensuring sustainability, inclusivity and equity. These were the catalytic points of discussions on actions needed to achieve the results (see Appendices 1(a) and 1(b). For Tanzania mainland where many stakeholders were listed, the least mentioned stakeholders (listed once) were mapped as one group assigned a frequency of one. In Tanzania mainland the top ranking stakeholders (Figure 4) include the ministries of Agriculture and Livestock; the ministry responsible for Regional Administration and Local Government; Food and Agriculture Organisation (FAO); and 4 in the same rank – were: Tanzania Food and Nutrition Centre (TFNC), NGOs and Word Food Programme (WFP). In Zanzibar, 3 in the highest rank include the Ministry of Agriculture, the Government and the Private sector. For Tanzania mainland, the least mentioned stakeholders include the IITA, SUA,

GAIN, WFP, UDSM, NMAIST, COSTECH, TFNC, TOSCI, ASA, TASTA, NiRC, TADB, WB, TPHPA, TFRA, Agro-dealers, PSO, SIDO, NFRA, COPRA, LATRA, TARURA, NFRA, MVIWATA, TBS, TMDA, MoE, and MCLA. The names of stakeholders are narrated in the list of acronyms.

Figure 4: Key stakeholders for implementation of Action Track 1

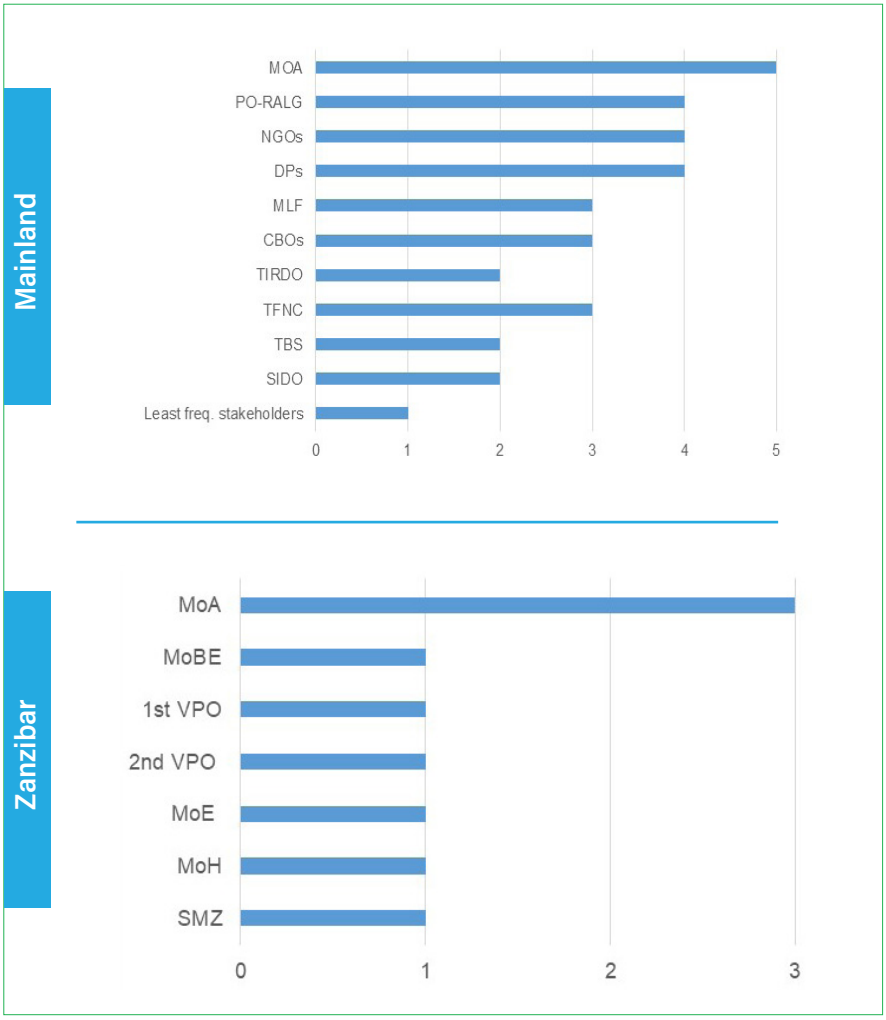


5.2. Key stakeholders for shifting sustainable consumption patterns (AT 2)

The guiding strands for this AT include creating enabling food environments, shifting food demand and halving food losses and wastes. The solutions listed by stakeholders in both Tanzania mainland and Zanzibar during the

dialogues are presented in Appendices 2(a) and 2(b)). Key stakeholders listed by stakeholders in the Tanzania mainland include the Ministry of Agriculture, Regional Administration and Local Governments under the President's Office, NGOs and development partners (Figure 5). In Zanzibar, Ministry of Agriculture was mentioned three times more than other important stakeholders including the Ministry of Blue Economy, 1st and 2nd Vice President's Offices, Ministry of Health and the Revisionary Government of Zanzibar. The group of least mentioned stakeholders for Tanzania mainland include the MEV, MoFP, MIT, MOHCDGCE, RUWASA, TANROADS, TARURA, TEMDO, UNEP, VPO-DoE, COPRA, CPB, NFRA, and, PMO.

Figure 5: Key stakeholders for implementation of Action Track 2



5.3. Key stakeholders for boosting nature-positive food systems (AT 3)

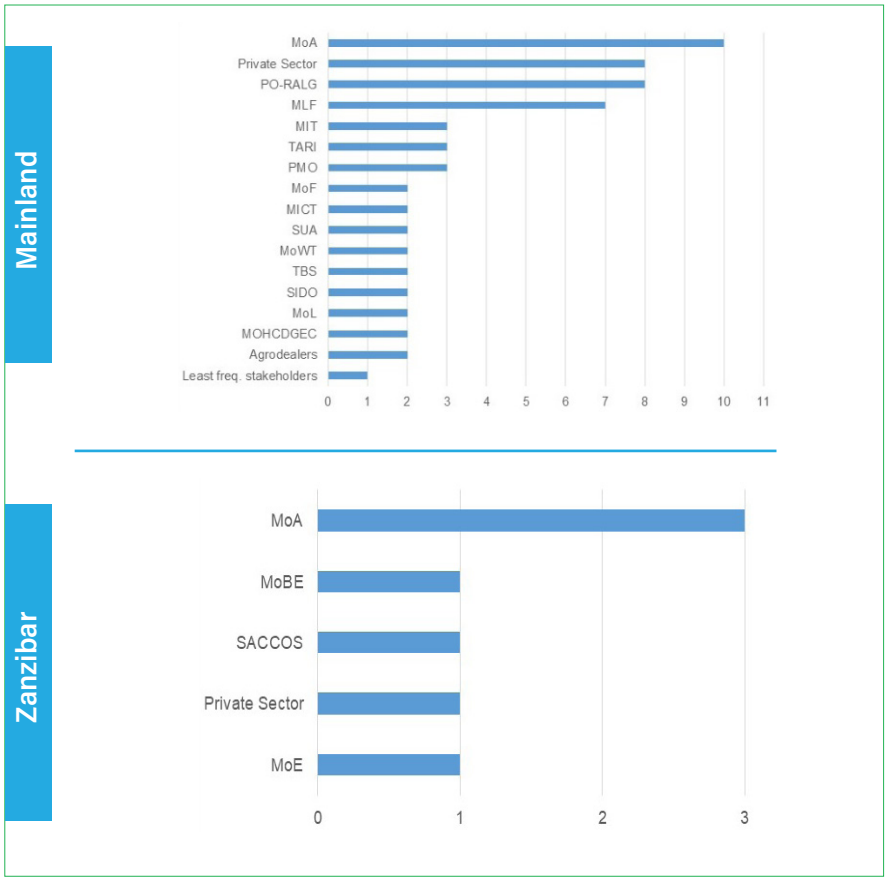
The basic strands of this action track that formed a basis of discussion of actions for results include protection of natural systems; sustainably management existing food production systems; and restoration and rehabilitation of degraded production systems. An array of solutions were identified together with key stakeholders (see Appendix 3(a) and 3(b)). The key stakeholders for Tanzania mainland included the Ministry of Agriculture, Community Based Organizations, the Media, the Vice President's Office (Department of Environment) and the Ministry of Lands (Figure 5). In Zanzibar, key stakeholders listed include: the Ministry of Agriculture, the Government of Zanzibar, the Private sector; and others mentioned once include the Ministry of Blue Economy, 1st and 2nd VPOs and commercial banks (Figure 5). The least mentioned category of stakeholders for the Tanzania mainland entails MCIS, MNRT, MoF, MoW, MVIWATA, NEMC, PCCB, SUA, TAFORI and UNEP.

Figure 6: Key stakeholders for implementation of Action Track 3

5.4. Key stakeholders for equitable livelihoods (AT 4)

This action track envisages strengthening agency, inclusive livelihood policies, and multi-dimensional welfare and access. The solutions to address this action track and respective key stakeholders needed for delivery of these solutions are presented in Appendices 4(a) and 4(b), for Tanzania mainland and Zanzibar, respectively. The Ministry of Agriculture, private sector, Regional Administration and Local Government under the President's Office and Ministry of Livestock were the topmost listed stakeholders in Tanzania mainland (Figure 6). In Zanzibar, 5 stakeholders were identified as key in the delivery of this AT – Ministry of Agriculture, Ministry of Blue Economy, Savings and Credit Cooperative Societies (SACCOS), the private sector and the Ministry of Energy (Figure 6). The least mentioned stakeholders for Tanzania mainland include Cooperatives, PO-PSMGG, MoW, MoH, TAWLA, TFNC, Mobile phone Co, Media, TASAF, NHIF, TAHA, AVRDC, TMDA, TADB, and Commercial Banks.

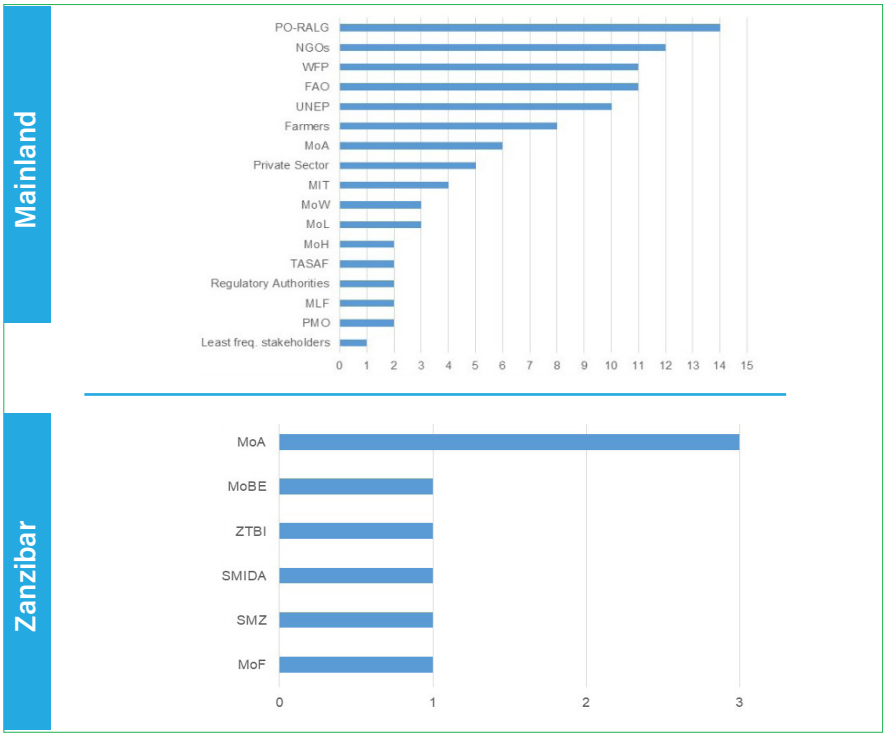
Figure 7: Key stakeholders for implementation of Action Track 4



5.5. Key stakeholders for building resilience to vulnerabilities, shocks and stresses (AT 5)

Under this action track the key strands include economic resilience (i.e., equitable and inclusive), social resilience (i.e., broad-based benefits for all) and environmental resilience (i.e., positive and regenerative impacts on the environment). An array of solutions identified to be critical in addressing this action track are listed in Appendices 5(a) and 5(b). In Tanzania mainland, the PO-RALG, NGOs, WFP, FAO and UNEP were the most frequently mentioned stakeholders (Figure 7). The profile of key stakeholders is reoriented a bit to stakeholders involved in disaster risk management and social protection actions. The Ministry of Agriculture is on the top of the list with remaining 5 stakeholders weighed equally in terms of frequency of being mentioned. In Zanzibar, the MoBE appear to be critical in every sphere of actions towards sustainable food systems and sustainable development. The least mentioned stakeholders in Tanzania mainland included insurance companies, TITA, Cooperatives, IFAD, TBS, TARURA, SIDO, TARI, ASA, VETA, TADB, Commercial Banks, Microfinance Institutions, VICOBA, NBS, TMA, Academia, RUWASA, NHIF, Red cross/ crescent, and TFNC.

Figure 8: Key stakeholders for implementation of Action Track 5



6.0 Post-summit way forward – a roadmap to 2030

Food system is at the centre stage of sustainable development agenda. The thrust of the country's multi-stakeholder dialogues was kick-start an inclusive journey of advancing the food systems for sustainable development agenda of 2030. The multi-stakeholder coalitions forged during the national dialogues will continue to fulfil the common vision of transforming the national food systems. Once the Summit has taken place, the Convener will organise a national stakeholder meeting involving participants from the previous dialogues to reflect on the overall outcomes of the UNFSS and collectively among others address the following broad tasks:

- Development of an action plan with results areas, indicators of targets for game-changing solutions that are aligned with existing sustainable development commitments by 2030;
- Undertake systematic analysis and mapping of stakeholders that are strategically needed to engage at different levels for implementing the game-changing solutions towards sustainable food systems; and
- Development of results-based monitoring and evaluation framework outlining how stakeholders will review, track progress and evaluate accomplished results.

REFERENCES

Agwanda, A. & Amani, H. (2014). 'Population growth, structure and momentum in Tanzania'. THDR 2014. Background paper No. 7, ESRF Discussion paper 61, Dar es Salaam.

Billen, G. Lassaletta, L., Garnier, J. (2015). A vast range of opportunities for feeding the world in 2050: trade-off between diet, N contamination and international trade. Environ. Res. Lett. 10, doi:10.1088/1748-9326/10/2/025001.

Fue and Mutabazi (2021). Transformation of smallholder agriculture in the digital era: the potential of Precision Agriculture in Tanzania. In: Ulimwengu wa Mkulima (Farmer's World), Vol. 10. ANSAF, Dar es Salaam.

Jayne, T.S., Chapoto, A., Sitko, N., Nkonde, C., Muyanga, M., & Chamberlin, J. (2014). 'Is the scramble for land in Africa foreclosing a smallholder agricultural expansion strategy?' Journal of International Affairs, Vol. 67, No. 2.

Marras S. (2018). Street Food in Tanzania. A Literature Review. Food and Agriculture Organisation of the United Nations. Dar es Salaam, Tanzania.

Msuya, F.E. (2011). 'The impact of seaweed farming on the socio-economic status of coastal community in Zanzibar'. Journal of World Aquaculture, 42(3): 45-48.

Reardon, T., Tschirley D., Minten B., Haggblade S., Timmer C.p., Liverpool-Tasie, S., Dolislager M., Snyder, J., Ijumba, C. (2015). Transformation of African agri-food systems in the new era of rapid urbanisation and emergence of a middle class. Chapter in the proceedings volume of the ReSAKSS annual conference, "Beyond a middle-income Africa"' Trends and Outlook Report Conference held in Addis Ababa, September 1-3 2015. Site accessed 28 June 2017.

RGoZ (2020). Key economic indicators of Zanzibar 2020.

RGoZ (2020a). Zanzibar blue economy policy. Zanzibar Planning Commission.

RGoZ (2021). Fisheries development plan 2020-2025. Zanzibar.

TDHS (2016). Tanzania Demographic and Health Survey. Dar es Salaam, Tanzania.

TNNS (2018). Tanzania National Nutrition Survey 2018. Dodoma, Tanzania.

Tschirley, D. et al. (2013) Megatrend two: rapid urbanisation and food system transformation, Global Centre for Food Systems Innovation, Michigan State University, East Lansing.

Tumbo, S.D., Mbilinyi, B.P., Rwehumbiza, F.B. and Mutabazi, K.D. (2010). Economics of climate change for agriculture sector in Tanzania: adaptation options and their costs. Soil-water Management Research Group, Sokoine University of Agriculture, Morogoro, Tanzania.

UNFSS 2020. Handbook for member states dialogues. Version 1.0.

URT (1996). Sustainable industrialisation policy (1996-2020). Ministry of Industry and Trade, Dar es Salaam

URT (2011). Integrated industrial development strategy 2025. Ministry of Industry and Trade, Dar es Salaam

URT (2016). National strategy for youth involvement in agriculture 2016-2021. Ministry of Agriculture, Livestock and Fisheries, Dar es Salaam.

URT (2018). Blueprint for regulatory reforms to improve the business environment. Dodoma, Tanzania.

URT (2021a). National Economic Survey 2020. Dar es Salaam

URT (2021b). National five-year development plan 2021/22–2025/26: Realising competitiveness and industrialisation for human development. Dodoma. Tanzania.

URT (2021c). Tanzania Dairy Board strategic plan, 2021-2026. Dodoma.

URT (2021d). Tanzania Meat Board strategic plan, 2021-2026. Dodoma

URT (forthcoming). Policy effectiveness analysis to improve resource allocation, investment and capacity development. Ministry of Agriculture, Dodoma.

Watkiss, P. Downing, T., Dyszynski, J., Pye, S. et al. (2011). The Economics of Climate Change in the United Republic of Tanzania. Report to Development Partners Group and the UK Department for International Development.

World Bank (2019). Transforming Agriculture. Tanzania Economic Update. World Bank, December 2019. Issue 13

Appendix 1(a): Action Track 1 solutions and key stakeholders, Mainland

Action Track	Key solutions	Stakeholders
Ensuring access to safe and nutritious food for all • *Achieving Zero Hunger* • *Increasing access to affordable, nutritious and safe foods* • *Increasing food safety* • *Ensuring sustainability, inclusivity and equity*	Nutrition sensitive investment in R&D (e.g., bio-fortified seeds)	MoA, MLF, TARI, TALIRI, TAFIRI, IITA, SUA, GAIN, FAO, WFP UDSM, NM-AIST, COSTECH, TFNC,TOSCI, ASA, TASTA
Strengthen irrigation infrastructures		MoA, NiRC, MoFP, FAO, IFAD, MoW, TADB
	Improve extension and outreach services including e-learning	MoA, MLF, PO-RALG, FAO, WFP, IFAD, WB, ASPIRES, EU, SAVE THE CHILDREN
	Awareness creation on appropriate use of agro-chemical inputs (in crops, livestock and fisheries)	MoA, MLF, PO-RALG, TPHPA, TFRA,TARI,TBS,AGRO-INPUT Dealers, NGO , PSO
	Improved post-harvest management of crops and animal products	MoA, MLF, MIT, PO-RALG,TBS, SIDO, TFNC, NFRA, CPB, COPRA, WFP, IFAD, FAO, ASPIRES, EU, SAVE THE CHILDREN
	Ensure food safety of street foods	Not identified yet
	Improve rural roads, community storage facilities, markets and market systems	LATRA, TARURA, PO-RALG, MoFP, NFRA, CPB, MVIWATA, MIT, TANIPAC, MLF, MoA,
	Improve quality of agricultural produce to ensure safe food and market accessibility	MoA, MIT, MLF, PO-RALG, TBS, TFNC,TMDA, NGOS, CBOS, FAO

Action Track	Key solutions	Stakeholders
	Awareness creation on Socio behavior change communication to promote consumption of nutritious food	MoHCDGEC, PO-RALG, MoE, TFNC, MoA, MLF, NGOs, CBOs, FAO, WFP
	Sensitize communities to produce and consume locally available nutritious foods (sack garden, small animal keeping, fish farming)	MoA, MLF, PO-RALG, MoHCDGEC, TFNC, FAO, WFP, SAVE THE CHILDREN, NGOs, CBOs
	Review existing policies, regulatory frameworks and guidelines to support the value chain for sustainability, availability and accessibility of food in the country	MoA, MLF, MoHCDGEC, MoW, ASPIRES, PO-RALG, MCLA

Appendix 1(b): Action Track 1 solutions and key stakeholders, Zanzibar

Action Tracks	Solutions	Stakeholders
Ensuring access to safe and nutritious food for all • *Achieving Zero Hunger* • *Increasing access to affordable, nutritious and safe foods* • *Increasing food safety* • *Ensuring sustainability, inclusivity and equity*	• Build the capacity of farmers and processors of food commodities to produce safe and nutritious foods • Improve production and processing infrastructure • Provide easily accessible and interest free credit • Promote community nutrition education in the society • Provision of nutrition counseling and support to mothers during first 1000 days to promote consumption of diversified foods in women and children • Support the monitoring and enforcement of the Code of marketing of breastmilk substitutes • Develop and implement regulations and laws on front of the package labeling to promote consumer awareness on healthy food choices • Integrate promotion of diversified diets into Village, Health and Nutrition Days platform • Encourage the use of indigenous varieties • Promote nutrient-rich and resilient crops • Reduce taxes, fees, charges in the food systems • Price stabilisation and strengthen the enforcements to control price • Harmonisation of regulatory bodies and agencies • Strengthen quality and safety standards for the fresh produce • To raise awareness about food safety • Develop a policy about food safety	RGoZ, Private Sector, MoELE, LGA, MoA, RGoZ, Chief Chemist, ZFDA, Zanzibar Bureau of standards (ZBS), House of Representatives, Farmers, MoBE

Action Tracks	Solutions	Stakeholders
	• Mainstream the food security and nutrition across sectors including school feeding programs • Improve knowledge of farmers on proper use of agrochemicals • Regulate importation, use and management of agro-chemicals • Promote investments in agroecology farming for long-term sustainability • Promote use of improved technologies and implements to increase agriculture production and productivity • Enhance knowledge and promote nutrient-dense crops including bio-fortification	

Appendix 2(a): Action Track 2 solutions and key stakeholders, Mainland

Action Track	Key solutions	Stakeholders
Shifting to sustainable consumption patterns • *Creating enabling food environments* • *Shifting Food demand* • *Halving Food waste*	• Intensive interventions on community nutrition education	TFNC, MOA, MOHCDGCE, MEV, DPs, NGOs, PO-RALG, CBOs
	• Improvement of food storage, processing and packaging technology • Food-fortification and bio-fortification	MOA, MLF, TBS, TFNC, SIDO, TIRDO, DPs, NGOs, PO-RALG, CBOs
	• Establishment of equipped local food markets in both urban and rural areas • Improvement of infrastructure and transport facilities to facilitate food logistics	TANROADS, TARURA, RUWASA, MIT, MOA, MLF, MFP,PMO,DPs, NGOs, PO-RALG
	• Use of reliable and sustainable food storage and packaging materials • Appropriate drying technology • Intensive interventions on post-harvest loss education • Promote re-use and re-cycling of food waste • Anti-food waste campaign and sustainable diets & lifestyles: think-eat-save	MOA, MLF, TBS, TFNC, TEMDO, TIRDO, DPs, SIDO, NGOs, PO-RALG, COPRA, NFRA, CPB,TANAPA, CBOs, VPO-DoE, UNEP

Appendix 2(b): Action Track 2 solutions and key stakeholders, Zanzibar

Action Track	Key solutions	Stakeholders
Shifting to sustainable consumption patterns • *Creating enabling food environments* • *Shifting Food demand* • *Halving Food waste*	• Establish and integrate early warning systems • Harmonise the emergency response systems • Establish management system of sustainable food systems • Strengthen post-harvest management in the food system including value addition, processing and storage systems	RGoZ, MOA, MOH, Land and Environment, Second Vice President, First Vice President, MOA, MOA, Ministry of Blue economy

Appendix 3(a): Action Track 3 solutions and key stakeholders, Mainland

Action Track	Key solutions	Stakeholders
Boost nature-positive food systems • *Protect natural systems* • *Sustainably manage existing food production systems* • *Restore and rehabilitate degraded production systems*	• Enabling policies and funding for agroforestry and other CSA practices and technologies	MoA, VPO-DoE, NEMC, UNEP, MVIWATA, FOs, TAFORI, TARI, CSOs, Media
	• Platform for the voice of gatherers and hunters community on food systems and conservation of ecosystems • Policies of protecting IK of people living in conservation and heritage areas • Respect and protect hunters, gatherers and other minority groups' rights to organise and to defend their environment	MOHCDGEC, MCAS, MoA, VPO-DoE, CSOs, Human rights organizations, Media
	• Promote action-oriented R&D towards restoration, rehabilitation and management of degraded production systems • Promote extension services bridging science into advisory services • Popularise new initiative from MoA on the guidelines for combating climate change • Strengthen technical and financial support for resilient and climate justice • Strengthen global partnerships to support environment and climate finance	MoA, TARI, SUA, VPO-DoE, Media
	• Smallholder farmers are leading the fight against hunger, the world and countries must support them • Scale-up village productive resources' use plans driven by farming, pastoral and fishing communities	MoA, PO-RALG, CSOs, MCDGHD, MoL, Media
	• Empower women including the right of access to productive resources (e.g., land, water, etc.,) and finance	MOHCDGEC, MoF, CSOs Media
	• To empower local communities and stakeholders to conserve wildlife and transboundary ecosystems	MNRT

Action Track	Key solutions	Stakeholders
	• To promote diversified sustainable livelihoods for communities in Transboundary Conservation Areas through small projects, microfinance, and tourism	CSOs, MoA
	• Rehabilitate water sources through planting of appropriate trees and other conservation measures • Promote RWH structures • Promote gravity irrigation systems from conserved water sources	MoA, VPO-DoE, MoW, CSOs
	• Good governance of climate aid and sustainable agriculture practices funding	CSOs, MOA. PCCB LGAs

Appendix 3(b): Action Track 3 solutions and key stakeholders, Zanzibar

Action Track	Key solutions	Stakeholders
Boost nature-positive food systems • *Protect natural systems* • *Sustainably manage existing food production systems* • *Restore and rehabilitate degraded production systems*	• Create awareness in the farming and fishing community about sustainable practices in the food systems • Build the capacity of livestock keepers on environmental conservation practices • Create awareness and knowledge on market-responsive production in the food systems • Train farmers and communities on GAPs, tree planting and protection of water sources and catchments • Establish community-based environmental management committees	MoA, , MOE, Private Sector, RGoZ, Commercial Banks, RGoZ, 2nd Vice President Office, 1st Vice President Office, MoBE

Appendix 4(a): Action Track 4 solutions and key stakeholders, Mainland

Action Track	Key solutions	Stakeholders
Advance Equitable Livelihoods • *Strengthening agency* • *Inclusive policies* • *Multi-dimensional welfare and access*	• Formation and strengthening of cooperatives, income groups and community saving groups • Scale-up contract farming	MoA, MLF, MITI, LGA, Farmers, Cooperatives, Agrodealers
	• Strengthen extension services to scale-up GAPs for increased food production	MoA, MLF, MOHCDGEC, PO-RALG, Private Sector
	• Gender mainstreaming in policies, strategies and plans • Build the capacity of women and youth in food businesses on entrepreneurship, nutrition-sensitive food processing, preparation, preservation, labelling, handling and marketing • Revisit women, youth and people with disability funding mechanisms to support and guarantee their participation in sustainable food systems	MoA, MIT, MLF, PO-RALG, PMO, MoL, MoH, SIDO, TFNC, TBS, MoWT, Private Sector
	• Strengthen frameworks and platforms to ensure active inclusion of all stakeholders and their voices in the action pathways to sustainable food systems	MoA, MLF, PMO, PO-RALG, MOHCDGEC, Private Sector, SUA, TARI
	• Promote timely access to symmetric market information by smallholder farmers, pastoralists and fishers to improve	MITI, MoA, MLF, MoIT, Mobile phone Co, Media
	• Develop policies/guidelines addressing working conditions of agri-food workers especially women, youth and people with disabilities	MoA, MLF, MOHCDGEC, PO-RALG, Agrodealers, MoIT
	• Institutionalize social protection policies to cover livelihoods of vulnerable players in the food systems including women, youth, people with disabilities and street food vendors	PMO, TASAF, Private Sector, MOHCDGEC, NHIF/CHF

Action Track	Key solutions	Stakeholders
	• Promote urban and peri-urban faming of fruits and vegetables for improved nutrition and income	PO-RALG, Private Sector, MoA, MLF, MoL, TAHA, AVDRC, TARI
	• Provide regulatory and fiscal incentive structures to agri-food traders to support accessibility of affordable nutritious foods	PO-RALG, TBS, TMDA, MoF, Private Sector, MIT
	• Promote investment in technologies to enable smallholder farmers diversify and upgrade productivity in the food systems	MoA, MoWT, Private Sector, SIDO, TARI, SUA
	• Expand agricultural finance services (incl. credit, insurance) for inclusive, competitive, resilient and sustainable food systems	MoF, MoA, Private Sector, Commercial Banks

Appendix 4(b): Action Track 4 solutions and key stakeholders, Zanzibar

Action Track	Solutions	Stakeholders
Advance Equitable Livelihoods • *Strengthening agency* • *Inclusive policies* • *Multi-dimensional welfare and access*	• Improve information and communication technology systems • Promote the use of improved farm technologies to improve production, productivity and profitability • Improve access to finance for investment in livelihood activities • Ensure compliance and enforcement of regulations • Promote knowledge on sustainable land management to restore natural vegetation • Promote joint committees in *shehia* • Develop livelihood supporting comprehensive and inclusive development policies • Promote agriculture finance by establishing Agricultural Bank for affordable lending to producers and SMEs • Enhance entrepreneurship leading to creativity and innovation on economic opportunities for farmers and fishers • Strengthen ZFCC to have price control mechanisms • Enforcement of implementation of laws and regulations through good governance • Promote coordination of smallholder farmers and fishers into efficient cooperatives • Expand the government programs of micro-credit provision to farmers	MOA, MoLE, Private Sector, SACCOS, MoBE

Appendix 5(a): Action Track 5 solutions and key stakeholders, Mainland

Solution	Details/ solution modified	Stakeholders
Building Resilience to Vulnerabilities, Shocks and Stresses • *Economic resilience (equitable and inclusive)* • *Social resilience (broad-based benefits for all)* • *Environmental resilience (positive and regenerative impacts on the environment)*	• Strengthen institutions and regulations on terms of trade/insurance schemes to mitigate shocks and build resilience in the food systems • Raise awareness on agricultural insurance in the food systems	Insurance Co, TIRA, MoA, MIT, MLF, PO-RALG, PMO, MoL, NGOs, UNEP, FAO, WFP, Private Sector, Farmers
	• Review Disaster Management Act, Land and Village Land Acts, and Wildlife Management Act, agriculture, livestock and fisheries policies to integrate food system elements on mitigation, preparedness and recovery • Develop National Action Plan for sustainable food systems	PMO, MoA, MLF, PO-RALG, NGOs, UNEP, FAO, WFP, IFAD, Private Sector, Farmers
	• Invest in modern food storage, processing and preservation structures that abide to technical specifications for resisting specific natural and human induces shocks • Build roads and markets that are technologically resilient to specific natural and human induced shocks	TBS, Regulatory Authorities, PO-RALG, MoA, MLF, TARURA, NGOs, UNEP, FAO, WFP, IFAD, Private Sector, Farmers
	• Strengthen entrepreneurship knowledge and skills to smallholder farmers particularly women, youth and people with disabilities to participate in food value chains • Introduce diversified agricultural activities which generate food diversity and profitable income generation	SIDO, TARI, ASA, VETA, TASAF, MIT, PO-RALG, Private Sector, NGOs, UNEP, FAO, WFP, IFAD, Farmers
	• Promote technologies which mitigate hazards and reduce vulnerabilities in food system • Maintain sustainability of soil health through agroecology such as conservation agriculture • Promote the use of climate and weather information for enhancing local food systems	MIT, MoA, MoA, MLF, PO-RALG, MoL, PMO, Private Sectors, NGOs, UNEP, FAO, WFP, IFAD, Farmers

Solution	Details/ solution modified	Stakeholders
	• Promote nutrients-dense drought and water stress resistance crops and animal species in the food systems • Promote climate-smart GAPs to enhance adaptation and resilience of the food systems • Promote the use climate-smart renewable and circular energy technologies in agri-food sector	
	• Enhance access to microfinance services by the most vulnerable to invest in production, diversification, speed-up recovery, and foster long-term resilience	TADB, Commercial Banks, PO-RALG, NGOs, MFIs, VICOBA, NGOs, UNEP, FAO, WFP, IFAD, Farmers
	• Strengthen surveillance, early warning systems to pro-actively inform ways of mitigating and managing triggers of vulnerabilities	NBS, TMA, MoA, TASAF, Academia, NGOs, UNEP, FAO, WFP, IFAD, Farmers
	• Promote inclusive health insurance schemes • Awareness campaigns to mitigate unconventional gender and socially-imbedded beliefs undermining healthy food consumption	PO-RALG, MoW, RUWASA, MoH, NGOs, UNEP, FAO, WFP, IFAD, HNIF/CHIF, Red cross/crescent, MoA, FAO, WFP, TFNS, Farmers
	• Proper planning of cities and towns for sustainable integration of urban farming of safe and nutritious foods • Awareness and sensitization of food systems and safety nets programs among the societies in towns and cities	PMO, MoL, PO-RALG, NGOs, UNEP, FAO, WFP, IFAD, Town/ City dwellers, Regulatory Authorities

Appendix 5(b): Action Track 5 solutions and key stakeholders, Zanzibar

Action Track	Solutions	Stakeholders
Building Resilience to Vulnerabilities, Shocks and Stresses • *Economic resilience (equitable and inclusive)* • *Social resilience (broad-based benefits for all)* • *Environmental resilience (positive and regenerative impacts on the environment)*	• Presence of political will • Establishment of small agro-processing industries • Strengthen importation and smuggling in of seeds and livestock • Improved information communication and access to communities • Increase awareness of and means of disaster risk mitigation and management by the communities • Promote environmental management education • Establish national food reserve strategy • Capacitate government institutions overseeing disaster risk management	MoA, MoF, RGoZ, SMIDA, ZTBI, MoBE

NOTICE

Address: "Kilimo Dodoma"
Government City-Mtumba,
P.O. BOX 2182, Dodoma
Tel. No: 255 (026) 22321407 I Fax: 255 (026) 2320037
Email: ps@kilimo.go.tz