THE UNITED REPUBLIC OF TANZANIA

THE NATIONAL ACTION PLAN ON ANTIMICROBIAL RESISTANCE 2023 -2028

NOVEMBER 2022

FOREWORD

Antimicrobial resistance (AMR) is projected to cause millions of deaths worldwide, with massive social, economic and global public health consequences. The overarching principle for addressing antimicrobial resistance is the promotion and protection of human health within the framework of a one health approach. Addressing AMR is integral to achieving the Sustainable Development Goals (SDGs); rising levels of AMR will make difficult to achieve the goals for health, poverty reduction, food security and economic growth. In recognition of that, the Tanzanian government is addressing the AMR problem through the implementation of the National Action Plan on Antimicrobial Resistance under one health approach.

The formulation of NAP-AMR 2023 - 2028 considered all the recommendations outlined in the report of the Implementation Status of the National Action Plan on Antimicrobial Resistance 2017-2022. While implementing NAP-AMR (2023-2028), it is of paramount importance that we consider and sustain the achievements made, and improve where we did not attain the planned interventions.

The NAP-AMR 2023-2028 incorporate six strategic objectives: Strenghten coordination, collaboration and governance for NAP on AMR implementation; Create awareness and understanding of antimicrobial resistance through effective information, education and communication; Strengthen the knowledge and evidence base through surveillance and research; Reduce the incidence of infection through effective sanitation, hygiene, infection prevention, and on-farm biosecurity ; Optimize the use of antimicrobial medicines in human and animal health; and develop the economic case for sustainable investment that takes into account the needs to increase investment in new medicines, diagnostic tools, vaccines and other interventions.

Effective implementation of the National Action Plan on Antimicrobial Resistance 2023-2028 will require commitment from responsible ministries, implementing institutions in public and private sectors, projects and all other AMR stakeholders. We therefore request all professionals and stakeholders in the human, animal, agriculture and environment sectors to use this important document and support the government in addressing the problem of antimicrobial resistance.

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ACKNOWLEDGEMENTS

The Government of the United Republic of Tanzania acknowledges the technical and financial support provided by various National and global actors in the implementation of the National Action Plan on Antimicrobial Resistance (NAP-AMR) 2017-2022. The World Health Organization (WHO), Food and Agriculture Organization of the United Nation (FAO), the Fleming Fund – Country and Regional Grant (lead by the American society of Microbiology-ASM and African Society for Laboratory Medicines ASLM), USAID funded projects [Medicines, Technologies and Pharmaceutical Services Program (MTaPS), Infectious Disease Detection and Surveillance (IDDS)], the Health Promotion and System Strengthening (HPSS) project (by the Swiss Tropical and Public Health) are duly acknowledged.

We acknowledge the research projects, Holistic Approach to Unravel Antimicrobial Resistance (HATUA), Support the National Action on Antimicrobial Resistance (SNAP-AMR). We acknowledge support from professional associations and non-governmental organizations on creating community awareness on AMR especially during the World Antimicrobial Awareness Week (WAAW). These outstanding efforts laid a foundation for preparation of the NAP-AMR (2023-2028).

The Government extends its appreciation to members of the National AMR Multi-sectoral Coordinating Committee (MCC) and AMR Technical Working Groups (TWGs) which were established under the leadership of the former Chief Medical Officer, Professor Muhammad Bakari Kambi; his championship and commitment on AMR will be always remembered.

The United Nation organs are dully acknowledged for their pivotal roles in the preparation of this document, and in particular, the World Health Organization (WHO), Food and Agriculture Organization of the United Nation (FAO), and the World Organization for Animal Health (WOAH). Responsible ministries involved in the development of this document are: Vice President's Office (VPO), Prime Minister's Office (PMO), Ministry of Livestock and Fisheries (MLF), Ministry of Agriculture (MoA) and Ministry of Health (MoH). Lead Institutions involved in the preparation of this document are cordially acknowledged which included, Catholic University of Health and Allied Sciences (CUHAS); Muhimbili University of Health and Allied Sciences (MUHAS), Sokoine University of Agriculture (SUA), St John's University and Tanzania Bureau of Standards (TBS). We thank all who contributed in developing, editing and costing this important document. Their names have been appended (appendix I). Lastly, but not least, we express gratitude to the WHO, USAID funded projects (MTaPS and IDDS) for the financial support enabled the development and printing of the document.

Prof. Tumaini Nagu

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ABBREVIATIONS AND ACRONYMS

ADDO	Accredited Dispensing Drug Outlets
AfyaSS	Afya support supervision
AMR	Antimicrobial Resistance
AMC	Antimicrobial Consumption
AMS	Antimicrobial Stewardship
AMU	Antimicrobial Use
APHTA	Association of Private Hospitals in Tanzania
ASLM	African Society for Laboratory Medicine
ATC	Anatomical Therapeutical Chemical
AWaRe	Access Watch and Reserve
BCC	Behavior Change Communication
BMC	Bugando Medical Centre
CDE	Centre for Disease Control and Prevention
CHMT	Council Health Management Team
CPD	Continuous Professional Development
CSSC	Christian Social Services Commission
DDD	Daily Defined Dose
DEOs	District Executive Officers
DHIS	District Health Information System
DPs	Development Partners
EIDSR	Integrated Disease Surveillance and Responses
eLMS	Electronic Logistics Management System
EQA	External Quality Assessment
FAO	Food and Agriculture Organization of the United Nations
FBO's	Faith base organizations
GARP	Global Antimicrobial Resistance Partnership
GHSA	Global Health Security Agenda
GLASS	Global Antimicrobial Resistance Surveillance System
GOVT	Government of Tanzania
HAART	Highly Active Anti-Retroviral Therapy
HAIs	Hospitals Acquired Infection
HCAI	Health Care Associated Infections
HFs	Health Facilities
HCW	Health Care Workers

HCF	Health Care Facilities
HICs	High-income countries
HIV	Human Immunodeficiency Virus
HMT	Health Management Team
HMTC	Hospital Medicines and Therapeutics Committee
HMIS	Health Management Information System
ICARS	International Centre for Antimicrobial Resistance Solutions
IDDS	Infectious Disease Detection and Surveillance
IDRS	Integrated Disease Surveillance and Response
IEC	Information, Education and Communication
IHR	International Health Regulation
IPC	Infection Prevention and Control
JEE	Joint External Evaluation
KAPB	Knowledge Attitude Practice and Behavioral
KCMC	Kilimanjaro Christian Medical Centre
LGAs	Local Government Authorities
MLF	Ministry of Livestock and Fisheries
MCC	Multi-Sectoral Coordinating Committee
MDR	Multi Drug Resistance
M&E	Monitoring and Evaluation
MoA	Ministry of Agriculture
MoEST	Ministry of Education, Science and Technology
MoH	Ministry of Health
MoW	Ministry of Water
MSD	Medical Stores Department
MSH	Management Science for Health
MTC	Medicine and Therapeutics Committee
NAP	National Action Plan
NEMC	National Environment Management Council
NEMLIT	National Essential Medicines List for Tanzania
NGO	Non-Governmental Organization
NPHL	National Public Health Laboratory
NSASHA	National Strategy for Accelerating Sanitation and Hygiene for All
NSMIS	National Sanitation Management Information System
PC	Pharmacy Council
PST	Pharmaceutical Society of Tanzania

PT	Proficiency Testing
PMO	Prime Minister's Office
PMOHCS	Prime Minister's Office One Health Coordination Section
PORALG	President's Office Regional Administration and Local Government
PPP	Public Private Partnership
ODF	Open Defecation Free
OH	One Health
QIT	Quality Improvement Team
RHMT	Regional Health Management Team
RRH	Regional Referral Hospitals
REOs	Regional Executive Officers
SBCC	Social Behaviour Change and Communication Campaigns
SDG	Sustainable Development Goals
STG	Standard Treatment Guidelines
SOPs	Standard Operating Procedures
SUA	Sokoine University of Agriculture
SWOT	Strength Weakness Opportunities and Threats
TAPI	Tanzania Association of Pharmaceutical Industries
TAVEPA	Tanzania Veterinary Para-professional Association
TB	Tuberculosis
TBS	Tanzania bureau of Standard
TMDA	Tanzania Medicines and Medical Devices Authority
TOTs	Training of Trainers
TPMA	Tanzania Pharmaceutical Manufacture Association
TrACSS	Tripartite AMR Country Self - Assessment Survey
TWG	Technical Working Group
TVA	Tanzania Veterinary Association
TVLA	Tanzania Veterinary Laboratory Agency
UNEP	United Nation Environmental Programme
USAID	The United States Agency for International Development
VCT	Veterinary Council of Tanzania
WAAW	World Antimicrobial Awareness Week
WASH	Water Sanitation and Hygiene
WHO	World Health Organization
WOAH	World Organization for Animal Health

DEFINITION OF TERMS

Anatomical Therapeutic Chemical (ATC): Classification System used for the classification of active ingredients of drugs according to the organ or system on which they act and their therapeutic, pharmacological and chemical properties.

Antibiotic: An agent or substance that is produced by or derived from a microorganism that kills or inhibits the growth of another living microorganism.

Antimicrobial: An agent or substance derived from any source (microorganisms, plants, animals, synthetic or semi-synthetic) that acts against any type of microorganism, such as bacteria (antibacterial), mycobacteria (anti-mycobacterial), fungi (antifungal), parasite (anti-parasitic) and viruses (antiviral). All antibiotics are antimicrobials, but not all antimicrobials are antibiotics.

Antimicrobial resistance (AMR): Microorganisms such as bacteria, fungi, viruses and parasites change when exposed to antimicrobial drugs such as antibacterials, antifungals, antivirals, antimalarials and anthelmintics. As a result, the medicines become ineffective.

Antimicrobial stewardship (AMS): A coherent set of actions which promote the responsible use of antimicrobials. This definition can be applied to actions at the individual level as well as the national and global level, and across human health, animal health and the environment.

Antimicrobial stewardship programme (AMS programme): An organizational or system-wide health-care strategy to promote appropriate use of antimicrobials through the implementation of evidence-based interventions.

Community-acquired infection: An infection acquired in the community, outside of a health-care setting.

Defined daily dose (DDD): Assumed average maintenance dose per day for a medicine used for its main indication in adults as established by the WHO Collaborating Centre for Drug Statistics and Methodology.

Hospital-associated infection: An infection occurring in a patient during care in a hospital or other health-care facility, which was not present or incubating at the time of admission. Health-care associated infections can also appear after discharge. They represent the most frequent adverse event associated with patient care.

One Health: A collaborative, multisectoral and transdisciplinary approach that recognizes the interconnections between people, animals, plants and their shared environment.

HOW THE DOCUMENT WAS DEVELOPED

The WHO Implementation Handbook for National Action Plan on Antimicrobial Resistance 2022, provided technical guidance and stepwise approach for the development of this document. The process commenced with the review of the implementation of the NAP-AMR 2017-2022 by documenting the achievements, gaps, challenges and recommendations.

Nominated experts from responsible TWG(s) and other key stakeholders developed a list of activities and sub activities for each strategic objective through an inclusive consultative process. The listed activities were based on the recommendations from the end line NAP with consideration of their importance in addressing AMR. The review of the list of key activities and sub activities were done during the stakeholder's validation meeting. Finally, the NAP AMR activities were costed using the WHO-NAP AMR costing tool.

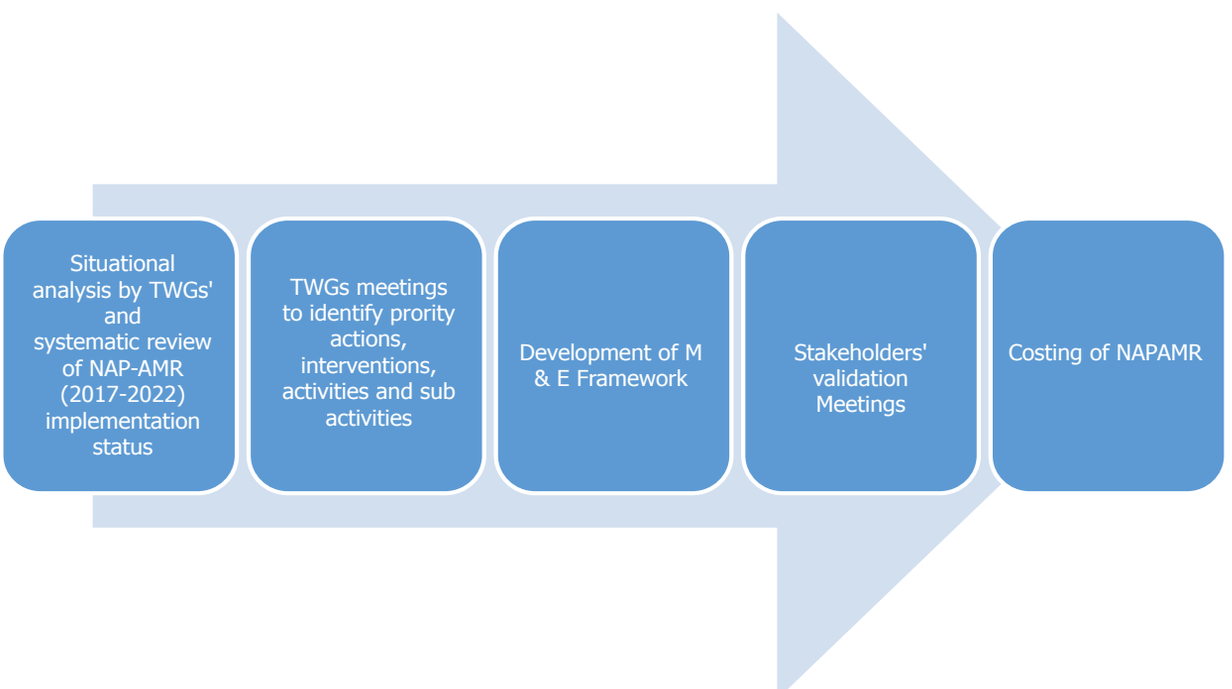


Figure 1. NAP-AMR 2023-2028 development process

EXECUTIVE SUMMARY

The National Action Plan on Antimicrobial Resistance (NAP-AMR, 2023-2028) envisage to continue with implementation of the five strategic objectives in line with the Global Action Plan on AMR. It has incorporated governance as an additional objective making a total of six strategic objectives. The plan is specifically informed by the achievements, gaps and challenges identified during the implementation of the NAP-AMR (2017-2022). It deploys globally harmonised plans for comparison purposes but taking into account local context.

The document stipulates the governance structure of the NAP-AMR which includes the establishment of the National AMR Coordinating Committee, the Technical Working Groups, the Secretariat and the AMR Focal Point. These are governed by clear roles and responsibilities as stipulated in the respective terms of references. It is also grounded on the whole system approach extending from individual level to macrosystem with clear multi-sectoral and inter-disciplinary involvement using One Health Approach.

The deliberated initiatives includes strengthening of an evidence-based public communication, Health Programme that targets human and animal health and the environment, with consideration of AMR along the food value chains; strengthening NAP-AMR implementation activities at national level and establishing such systems at sub-national levels; fostering more private sectors engagement; re-structuring of policy, regulations and guidelines to reinforce conformity at individual level, institutional-level and country-level; utilization of AMR data generated across strategic objectives to inform national and institutional-specific guidelines for priority infectious diseases' diagnosis, treatment, control and prevention.

This plan also equally acknowledges a need to bridge the NAP-AMR implementation gaps between human and animal sectors, with plant and environment sectors. It is projected that more hospitals and veterinary centres will be included with AMR/AMC/AMU surveillance system and, systematic collection of health care associated infections and farm-based biosecurity measures to inform evidence-based practices. The NAP-AMR (2023 – 2028) intents to enrol all tertiary and regional referral hospitals, and a few selected district hospitals into the antimicrobial stewardship programs.

However, central to these initiatives is to strengthen laboratory diagnostic infrastructures and vaccination in humans and animals which underscore a need to use antimicrobial agents prudently. Interventions to optimize the use of antimicrobial agents in human and animal health will also include strengthening regulatory authority for controlling quality, distribution and use of antimicrobial agents; strengthening patient and health care provider compliance; reducing the prevalence of substandard medicines for both human and veterinary use and inappropriate or unregulated use of antimicrobial agents in agriculture. The operational plan matrix gives details on how each activity will be conducted; and of interest, monitoring and evaluation framework comprises indicators which will be measured in the process of implementation.

Finally, this plan envisages to leverage existing resources (human, material and financial resources) so as to maximise the intended outputs, outcomes and ultimately impacts to sustain these initiatives. This document include a total of six strategic objectives which altogether generates 11 priority actions, 34 strategic interventions, and 85 activities. It is estimated that, Tanzania shillings 61,541,380,950 will be needed to support the implementation of the NAP-AMR 2023-2028 and activities were costed across six strategic areas: Governance (TZS. 2,369,702,017/=); Awareness and Education (TZS 4,580,344,679/=); AMR/AMC/AMU Surveillance and Research (TZS 27,953,082,645/=); Infection Prevention and Control (15,578,376,279/=); Optimizie use of antimicrobials (TZS 4,814,203,124) and Sustainable investment (TZS 6,245,672,206/=).

INTRODUCTION

Antimicrobials play an essential role in combatting infectious diseases in both humans, animals and plants. Antimicrobials are most often named according to the spectrum of microorganisms they target (e.g., antibacterials, antivirals, antifungals and antiparasites) or the microbial ultrastructure where the agents act (e.g., cell wall/cell membrane inhibitors, protein synthesis inhibitors, DNA inhibitors, metabolic pathway inhibitors).

Antimicrobial resistance (AMR) is a complex and multi-factorial phenomenon which refers to non-susceptibility of microorganisms to antimicrobial agents. It encompasses both inherent microbial genetic factors and/or acquired factors related to overuse/misuse of these agents resulting into antimicrobial selective pressure killing susceptible microorganisms and selecting the resistant ones which in turn propagate.

The emergence and spread of antimicrobial drug-resistant organisms is a global challenge. AMR is causing adverse social-cultural, economic and clinical impacts both in developed and developing countries. Infectious diseases notably, urinary tract infections, skin and soft tissue infections, and blood stream infections caused by multidrug resistant pathogens result into prolonged hospitalization, morbidity, mortality and extra cost.

It is projected that if multi-sectoral responsive actions are not coordinated and systematically undertaken at country and global levels, by 2050, the economic and clinical impacts attributable to AMR will be enormous with approximately 10 million deaths yearly and an average annual loss of approximately 3 trillion dollars (or a cumulative loss of more than 100 trillion USD). Furthermore, the impacts will be predominantly in the African and Asian regions *(O'Neill J et al., 2014).*[1]

In recognition of the global threat posed by antimicrobial resistance (AMR), in May 2015, the World Health Assembly adopted the Global Action Plan (GAP) on AMR. Tanzania, being one of the countries that ratified the GAP on AMR, in April 2017, it established the National Action Plan (NAP) on AMR in line with the GAP objectives. The aim of establishing the NAP was to tackle AMR using a sound one health AMR coordination mechanism.

There have been remarkable progresses in implementation of the NAP-AMR (2017-2022), although with notable inter- and intra-sectoral variations in the level of achievements. For examples, most of the priority actions, strategic interventions and activities were largely implemented at the national-levels (ministerial level, national/zonal hospitals, and in selected regional referral hospitals; as well as central and zonal veterinary centers). Therefore, the proposed NAP-AMR (2023- 2028) will extend the implementation activities to sub-national levels (i.e. more regional and district/council levels engagement). It will also engage more private sectors (especially in human health) to address implementation gaps which were obvious in the previous NAP to ensure holistic implementation activities.

It is also important to reiterate the fact that the previous NAP-AMR (2017-2022) had implementation variations across sectors. For example, implementation was largely done in the human sector compared to animal sector, and implementation were sparsely done in the plant and environment sectors. Therefore, the NAP-AMR will strengthen the established milestones in the human sector, while equally establishing/developing tangible actions in the animal, plant and environmental sectors.

[1] *O'Neill, J. (2014) Antimicrobial Resistance: Tackling a Crisis for the Health and Wealth of Nations. The Review on Antimicrobial Resistance, 20, 1-16.*

The NAP-AMR (2023-2028) will also aim to translate deliverables from the previous NAP-AMR into evidence-based practices and policy changes. For example, the prevailing evidence on the high susceptibility patterns of nitrofurantoin against *Escherichia coli* and other pathogens causing urinary tract infection was used to inform the revised Tanzania Standard Treatment Guidelines and National Essential Medicines List, 2021. Similarly, the higher resistance profiles to pathogens causing blood stream infections in the tertiary and regional referral hospitals compared to primary health care facilities underscore a need to have antimicrobial treatment guidelines which are tier-specific.

The NAP-AMR will also operationalize the newly incorporate feature in the DHIS-2 on routinely monitoring of surgical site infections across secondary and tertiary health facilities, and guide specific infection and control measures. Systematic collection of antimicrobial consumption and antimicrobial use data as proposed in the NAP-AMR will also enable assessment of country's conformity to the global frameworks (such as AWaRe categorization of antibiotics). Finally, the NAP-AMR (2023-2028), emphasize on monitoring and enable real-time tracking of activity implementation and thereby, provide tailored responsive measures, as well as impact evaluation.

Addressing AMR is crucial in achieving the Sustainable Development Goals (SDGs) and through the NAP-AMR (2023-2028), Tanzania will uphold the Agenda of the Sixty-eighth World Health Assembly of May 2015 which urged the Member States to develop and subsequent systematically revise their National Action Plans for AMR using a "One Health Approach". The NAP provides a structure for a coordinated response and strengthening AMR interventions among the numerous sectors and actors, including human, animal, agriculture, finance, environment, and well-informed consumers.

The NAP-AMR 2023 – 2028 is grounded on the whole system approach extending from individual level to macrosystem. Our vision is to effectively contain AMR using One Health Approach towards the attainment of Universal Health Coverage and the UN Sustainable Development Goals by 2030. The NAP-AMR 2023-2028 is structured around key strategic objectives, interventions and activities to slow the development and spread of AMR and improve health outcomes in humans, animals and plants.

The NAP-AMR 2023-2028 has incorporated governance as an additional strategic objective making a total of six strategic objectives.

i. Strengthen coordination, collaboration and governance for NAP on AMR implementation.

ii. Create awareness and understanding of antimicrobial resistance through effective information, education and communication.

iii. Strengthen the knowledge and evidence based through surveillance and research.

iv. Reduce the incidence of infection through effective sanitation, hygiene, infection prevention, and on-farm biosecurity.

v. Optimize the use of antimicrobial agents in human and animal health.

vi. Develop the economic case for sustainable investment that takes account of the needs of countries to increase investment in new medicines, diagnostic tools, vaccines and other interventions.

The NAP-AMR 2023 - 2028 is costed based on the WHO NAP-AMR costing tool. Monitoring and evaluation section is well framed with key performance indicators for tracking the effectiveness and efficiency of NAP AMR implementation. Additionally, monitoring and evaluation TWG has been established making a total of five TWGs (instead of four TWGs in the NAP-AMR 2017-2022).

OUR 10-YEAR VISION FOR CONTAINING AMR

By 2030, AMR is effectively contained through multi-sectoral and inter - disciplinary coordination in line with the National Development Plan (2021/22-2025/26), Universal Health Coverage, Global Health Security Agenda and the UN Sustainable Development Goals.

Tanzania is determined to sustain its efforts to combat AMR, taking local and national actions using a One Health approach and working across the whole system. This system spans from microbial communities to human and animal communities and their shared social, political and physical environment.

Tanzania will lead the way in finding sustainable solutions to tackling AMR in line with global ambitions and in collaboration with other nations, partners and the international community. We will achieve this through delivering six strategic objectives.

Box 1. A 10 Year Vision for containing AMR in Tanzania

SITUATIONAL ANALYSIS

The GHSA supports antimicrobial resistance (AMR) containment through its AMR action package, 1 of the 19 technical areas addressed by the agenda. In February 2016, Tanzania was the first country to undergo Joint External Evaluation (JEE). The findings demonstrated that although there had been significant progress in establishing laws and policies for IHR, gaps still existed in the country's core capacities to prevent, detect, and respond to public health emergencies. Tanzania's mainland was rated as having "no capacity" (score one) for antimicrobial stewardship (AMS) and "developed capacity" (score three) for health care-associated infection (HCAI) prevention and control (IPC) programs. The previous NAP AMR (2017-2022) has allowed significant progress to be made in addressing the gaps outlined in the JEE and addressing WHO benchmark actions.

Through the multisectoral and interdisciplinary collaboration, the following major milestones were reached during implementation of the NAP-AMR (2017- 2022) which in turn laid the background frameworks for the NAP-AMR (2023-2028):

AMR Milestones in Tanzania in the NAP-AMR (2017-2022)

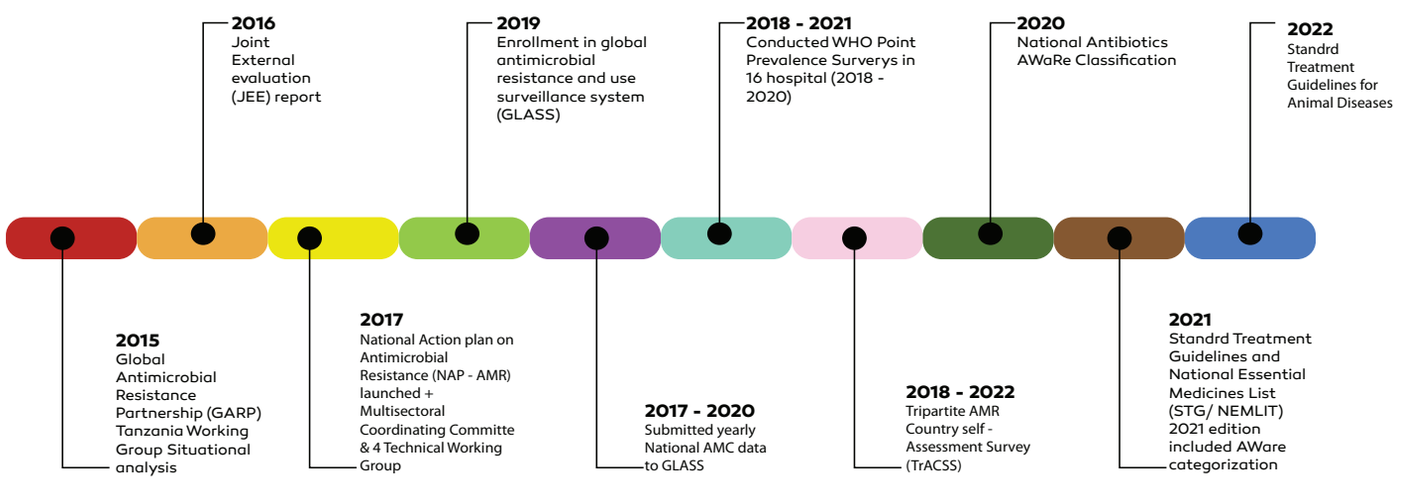


Figure 2: NAP-AMR Milestones 2017-2022

Detailed information on the current situation is described under section 2.1, 2.2, 2.3, 2.4,2.5, 2.6 & 2.7 below.

2.1 Coordination, Collaboration and Governance

The National Multi-Sectoral Coordinating Committee (MCC) on AMR is the central national steering committee mandated to provide an oversight and coordination of all NAP-AMR activities through its Secretariat and Technical Working Groups (TWGs). These include TWG for awareness, effective communication and education; TWG for surveillance and research; TWG for sanitation, hygiene and infection prevention and control (IPC); and TWG for antimicrobial stewardship.

The Tanzania NAP-AMR framework is grounded on One Health approach to ensure holistic interventional measures to combat AMR. Key stakeholders implementing this plan include (but not limited to) ministries, departments and agencies including the quadripartite United Nation Agencies (WHO, FAO, WOAH and UNEP) through their global, regional and country's offices. Various ministries, departments and sections include Vice President's Office, Tanzania One Health Coordination Section under the Prime Minister's Office, Ministry of Health, Ministry of Livestock and Fisheries, Ministry of Agriculture and President's Office Regional and Local Government Authorities. Others are Hospitals and veterinary centers; Universities; Regulatory Authorities; Professional Bodies; and Research Institutions. In addition, stakeholders include Development Partners and Local and International Non - Government Organizations.

The NAP- AMR is also well integrated in existing national programs and policies relevant to AMR such as infection prevention and control (IPC), Water Sanitation and Hygiene (WASH), optimization of antimicrobial use (Stewardship), National Antimicrobial Resistance Surveillance Framework, and Multsectoral Antimicrobial Resistance Communication Strategy (Moving from Awareness to Action. The implementation of NAP- AMR is also well aligned with global and national initiatives related to the Global Health Security Agenda (GHSA).

With its quarterly meetings, the MCC provides leadership and coordination, momentum building, advocacy, communication, evidence building and monitoring of the implementation of the NAP. Co-chaired by the Chief Medical Officer (Health Sector) and the Director of Veterinary Services (Animal Sector), the MCC has high-level support, authority and clear lines of accountability to lead the Technical Working groups and oversee the implementation of AMR activities from different sectors.

2.2 Awareness, Risk Communication and Education on AMR

The first Strategic Objective recognizes the importance of improving awareness and understanding of AMR, and of promoting behavioral change, through effective communication, education and support at national and sub-national levels. Therefore, priority actions of NAP-AMR 2017-2022 included health communications and education of healthcare providers. Understanding the whole system helps point to where we can best intervene.

The causes of AMR are complex and different in low-and-middle income countries (LMICs) compared to high-income countries (HICs). Therefore, developing communications around AMR can be challenging and approaches used in certain contexts may not apply to others. Overall challenges around AMR communication relate to the fact that it is a multi-faceted problem spanning a range of health issues, from surgery to the management of chronic diseases, and the treatment and prevention of infectious diseases.

Furthermore, AMR is often an invisible problem with multiple drivers and affecting multiple systems, including humans, livestock and the environment. Complicated terminology makes AMR a difficult concept to explain and understand. These complexities can result in conflicting and confusing messages that ask people to act in contradictory ways. Finally, global messages around AMR have often limited adaptations to specific local situations and audiences. Therefore, tailoring information to audiences in human health, animal health and agricultural practice as well as consumers is essential and this information should be developed based on the specific context within which it is going to be used.

Recognizing the complexities of effective AMR communication, NAP-AMR 2017-2022 encouraged research and activities around the creation of awareness and understanding of AMR amongst the public using informative, sensitive, thoughtful and locally-relevant communications. It also explored health communications between patients and providers in order to establish trust while supporting social networks that affect health outcomes.

There have been Knowledge, Attitude, Practice and Behavioral (KAPB) studies as well as other key mixed-method and qualitative research conducted in both the human and animal health sectors across the country. There have been both small scale (in a few regions) and broader studies (cross-country) conducted by various Universities and Research Institutions across the country.

The country has a *Multi-sectoral Antimicrobial Resistance Communication Strategy "Moving from Awareness to Action" 2020-2025,* which was successfully developed in 2020 through One Health Approach. This was shared successfully to all relevant stakeholders. In addition, the country is commemorating WAAW successfully annually since 2017 to date. The themes for WAAW for each year are adopted from, WHO the chief custodian of GAP and NAP AMR at global and National scales.

During WAAW commemorations, which are mostly done at the National level, high-level dignitaries from the line ministries and the quadripartite organizations for AMR (WHO, WOAH (OIE), FAO and UNEP) deliver key statements to mark the week. At the same time, a wide range of AMR dissemination activities are done through television, radios, newspapers and social media. NGO's including Roll Back AMR, Tanzania Pharmacy Students Association (TAPSA), Hermargs Institute Alliance for Solutions (HIASO), One Health Society, Students one Health Innovation Clubs (SOHIC) carry out AMR activities that cascade to community and grass-root levels. An example of awareness campaign using SNAP-AMR staged model which takes into account six sequential stages (inputs, implementation plan, testing, baseline data collection, outcome measures, and process evaluation) is presented in the box below:

Research example 2: Public vehicles AMR awareness campaign at zonal hospitals from the SNAP-AMR project

Key activities: A 10-week information campaign using public vehicles (*bajajis, daladala*) at two zonal hospitals. Co-development of videos, songs, and visual materials occurred with health providers, vehicle drivers, and the public. Outcomes of the campaign's pre (n=2000) and post surveys (n=2000 passengers) provides evidence of improved awareness about AMR and empowerment of drivers and other participants as AMR champions.

Key findings:

1. Over two-thirds of people coming out of campaign vehicles were able to recall campaign messages described feeling empowered and educated.
2. There was an increase in people's knowledge about AMR, the safe use of antibiotics and hygiene measures to help prevent infections.
3. Campaigns can be a cost-effective means for raising awareness and scaled up for other health care facilities, or for other sectors such as animal health and agriculture.
4. Drivers became ambassadors and helped expand the social information network.
5. Song and video can be found on the YouTube channel: https://youtu.be/-5q5404

Box 2: An example AMR awereness campaigns conducted during NAP-AMR 2017-2022

In Tanzania AMR education is provided through pre-service and in-service training programmes. The pre-service training is well covered at universities (regulated by TCU) and Technical Institutions (regulated by NACTVET). Through Continuous Profession Development (CPD) and short courses, AMR education is provided to in-service personnel. Such courses are regulated by the Professional Councils such as Tanzania Veterinary Council (TVC), Tanganyika Medical Council (TMC) Tanzania Nursing and Midwifery Council (TNMC). and Pharmacy Council (PC).

2.3 Strengthen the AMR Knowledge and Evidence through Surveillance

The country has a National One Health AMR surveillance protocol (AMR surveillance Framework 2018) to guide AMR surveillance in Tanzania. The protocol was developed based on a desk review of the existing infectious disease surveillance system. Further, AMR specific surveillance protocols were developed for poultry, dairy cattle to cover zoonotic and mastitis pathogens, and a national framework on antifungal medication use and resistance surveillance. Several Standard Operating Procedures (SOPs) for AMR surveillance implementation were established based on the developed protocols.

Assessment of capacity was done in human and animal health laboratories. As a result, the National Public Health Laboratory (NPHL) and Central Veterinary Laboratory (CVL) were designated reference laboratories for AMR surveillance in humans and animals, respectively. In addition, 25 human and 11 animal health laboratories were considered suitable for culture and antimicrobial susceptibility testing. Of these, ten human laboratories and five animal laboratories were enrolled to carry out AMR surveillance. These laboratories were renovated and supplied with essential equipment for storage, testing, isolate identification and antimicrobial susceptibility testing. At present, two GLASS priority samples (blood and urine) are currently prioritised for AMR surveillance in humans.

The laboratories selected for implementation of AMR surveillance in Tanzania received training, mentorship, and supportive supervision of AMR activities. In the animal health sector, a total of nine training courses, six on basic AMR surveillance and three on AMR data management, were conducted at the CVL and zonal laboratories in Mwanza, Arusha, SUA, and Iringa. In the human health sector, more than ten training sessions were conducted, including basic microbiology, AMR data quality, forecasting and quantification of microbiological commodities, sample and data management, biosafety and biosecurity. In addition, the AMR surveillance sites received quarterly mentorship and supportive supervision supported by AMR implementing partners.

A master list of materials, reagents, and items for AMR surveillance is required for AMR activities to run smoothly. Laboratory supply master lists and supply chain mechanisms such as electronic Logistic Information Management Systems (e-LIMS) has been developed in the human sector. A master list and SOPs for monitoring supplies has also been developed in the animal sector, although this information is not captured electronically.

Laboratory personnel working in the human and animal health sectors have been trained. In addition, in these sectors, support for implementing an external quality assurance (EQA) scheme, which covers AMR priority pathogens and samples, has been provided. The National Public Health Laboratory participates in EQA programs provided by NICD-South Africa and EQuAFRICA twice a year. NPHL also serves as an EQA service provider for Tertiary and Referral Regional Hospitals with the capacity to perform culture and antimicrobial susceptibility testing in the country, including AMR surveillance sentinel sites. Regarding the animal health sector, EQA on AMR is carried out by the Tanzania CVL, which acts as a national reference laboratory, and selected TVLA zonal laboratories (Arusha and Iringa) as well as Sokoine University of Agriculture (focusing on surveillance) and EQuAfrica as the EQA provider. Existing studies in Tanzania are showing overarching drivers for AMR in the health care settings and communities requiring holistic interventions involving the whole system as shown in the figure 3 below:

Figure 3: Drivers of resistance in healthcare settings and community level

Specific surveillance systems exist in the animal and human health sectors. In the human health sector, sentinel hospitals for AMR surveillance are: Muhimbili National Hospital, Bugando Medical Centre, Benjamin Mpaka Zonal Referral Hospital (ZRH), Mbeha ZRH, Kilimanjaro Christian Medical Centre, Morogoro Regional Referral Hospital (RRH), Maweni RRH, Mnazi Mmoja Hospital and Temeke RRH. These hospitals report AMR data to the NPHL. National aggregated data is shared with the Global Antimicrobial Resistance Surveillance System (GLASS) after being approved by the MCC. In the animal health sector, AMR data from sentinel sites including Sokoine University of Agriculture, Mwanza Tanzania Veterinary Laboratory Agency (TVLA), Arusha TVLA and Central Veterinary Laboratory (CVL) is are submitted to the at CVL. The aggregated animal health data is sent to the DVS to be reported to the World Organization for Animal Health (WOAH). Tanzania successfully submitted AMR data to WHO - GLASS in 2020 (n=7926) and in 2021 (n=21957), with an overall 46.9% increase. The predominant isolates in the two samples were *Escherichia coli, Klebsiella pneumoniae and Staphylococcus aureus* (figure 4 below).

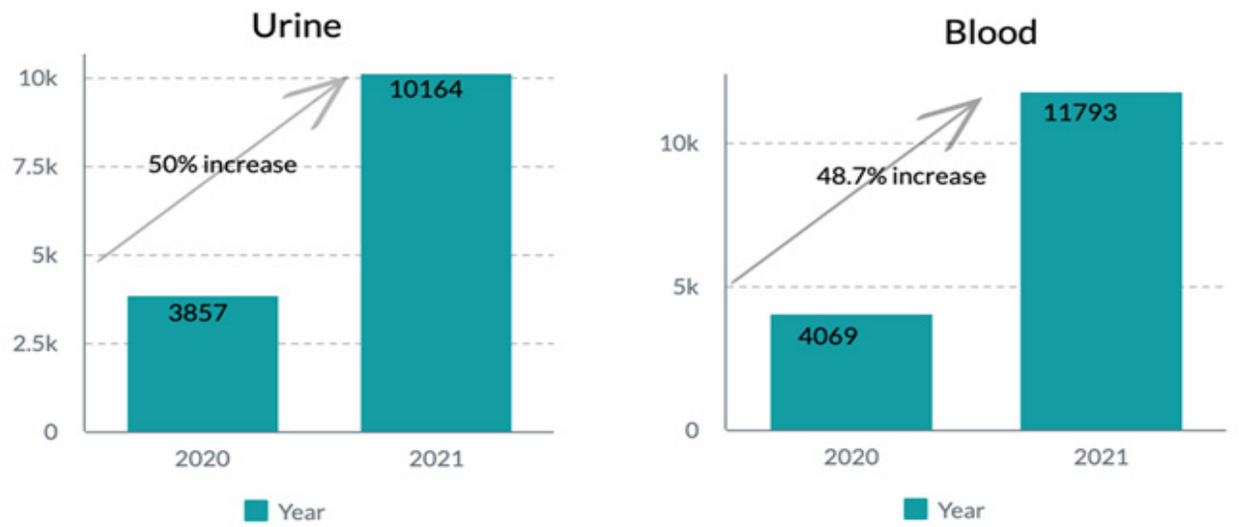


Figure 4: Percentage increase in the total number of samples submitted from sentinel hospitals to the NPHL which were validated and submitted to WHO-GLASS (July – December 2020, and January – December 2021).

Table 1. Percentage of susceptible pathogens from urine and blood samples between January and December 2021

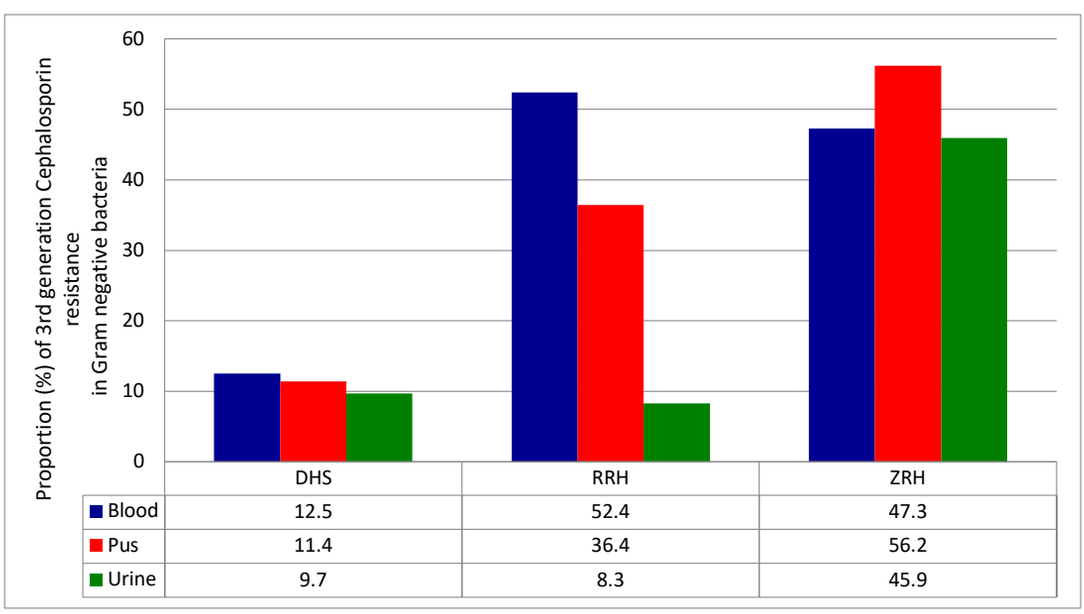
ALL GRAM NEGATIVE IN URINE(N= 2007)	Number	Ampicillin	Amoxicillin/Clavulanic acid	Piperacillin/Tazobactam	Ceftazidime	Ceftriaxone	Cefotaxime	Cefepime	Imipenem	Meropenem	Amikacin	Gentamicin	Ciprofloxacin	Trimethoprim/Sulfamethoxazole	Nitrofurantoin	Chloramphenicol	Cefoxitin/ Oxacillin	Clindamycin	Erythromycin	Tetracycline
Escherichia coli	1154	8.0	54.0	27.1	42.1	40.3	30.0	37.3	92.1	93.0	86.46	59.2	32.9	16.5	84.2					
Klebsiella pneumoniae	341	3.9	53	17.2	36.6	41.6	30.5	36.1	92.9	89.9	94.20	55.1	49.3	23.1	45.6					
Klebsiella oxytoca	63	2.8	47.7	44.4	59.6	60.4				91.3	93.80	57.4	56.1	30.2	66.7					
Proteus mirabilis	56	29.03	70.45		82.50	82.05		75.86		94.59		67.57	65	35.48	15					
Proteus vulgaris	40	13.04	65.71		68.97	72.41				96.67		75.00	63.33	36.67	34.38					
Klebsiella oxytoca	63	2.8	47.7	44.4	59.6	60.4		52.8		91.3	93.8	57.4	56.1	30.2	66.7					
Citrobacter freundii	139	10.8	30.6	30.8	39.4	37.9	30.0	43.8	91.7	90.2	85.4	44.9	31.6	26.6	66.3					
Pseudomonas aeruginosa	151			46.5	42.3			38.5	57.1	60.2	75.6	58.9	42.1							
GRAM POSITIVE IN URINE (N=394)																				
Staphylococcus aureus	266											57.3	30.3	25.9		57.1	33.9	36.3	9.6	39.2
Enterococcus faecalis	128												16.3		88.6				5.0	
ALL GRAM NEGATIVE IN BLOOD (N=806)																				
Escherichia coli	183	7.1	51.4	19.0	26.2	19.4	13.3	21.5	91.3	93.0	89.4	50.4	30.2	14.9		58.8				
Klebsiella pneumoniae	339	2.50	23.44	26.04	28.07	13.89	17.71	15.02	63.83	88.51	90.70	24.60	53.01	13.25		67.86				
Klebsiella oxytoca	32	5.0	44.4	12.5	21.4	10.5	11.1	9.1	75	70.8	94.40	34.6	28.6	21.7						
Klebsiella aerogenes	40	2.7	58.3	23.1	13.9	5.9		19.40		100	92.30	63.3	42.5	48.1						
Enterobacter cloacae	30	5.9	25.0	29.6	13.6					85.7	75.00	54.5	23.1	57.1						
Acinetobacter sp.	113			66.1	67.0	37.8	21.9	38.8	78.6	74.6	76.20	47.8	69.7	29.2						
Pseudomonas aeruginosa	69			**74.3**	**83.3**			55.6	76.5	78.4	72.10	75.6	80							
ALL GRAM POSITIVE IN BLOOD (N=2753)																				
Staphylococcus aureus	956											53.8	43.6	28.7		82.1	33.7	64.7	16.7	65.0
coagulase negative staphylococcus	1733											36.8	43.6	18.9		79.2	13.1	69.7	7.0	
Enterococces sp	64												13.9			61.1				52.9

≥80%	
50%-79%	
1%-49%	
Not tested	

Although Tanzania has not developed a national multi - sectoral research agenda, some academic and research institutions/organizations in the human and animal health sectors, like NIMR, SUA, MUHAS, and SACIDS, have research agenda and strategies that include AMR and One Health. The need to have a national research agenda and clear guidelines for combating AMR is still high.

Sharing research findings is a crucial way to inform policy makers. One of the ways to do this is through organizing and conducting National AMR scientific conferences and symposia. Specific National AMR symposia were conducted in April 2017 and November 2022. In addition, several AMR conferences and symposia have been held by some institutes including NIMR, TVA, and academic institutions through scientific symposia and conferences. However, most shared AMR information was from the human and animal health sectors. Other sectors still have no systems for sharing information obtained through AMR research. National reference laboratories for human and animal health host AMR data repositories and bio-banks related to support surveillance activities sustainably. Establishing a national multi-sectoral AMR data repository and bio-bank center is in progress.

The Tanzania AMR Surveillance framework is centered at tertiary hospitals and a few selected RRHs. During the implementation of the NAP-AMR (2017-2022), the SNAP-AMR project conducted a research on the feasibility of cascading these initiatives to district hospitals by providing laboratory diagnostic infrastructures and human capacity development. A total of 2316 patients were enrolled between June 2019 and June 2022 in five hospitals (Bugando Medical Center, Sekou Toure RRH and three district hospitals). Resistance to the third generation cephalosporins among Gram negative bacteria isolated from patients with blood stream infection, skin and soft tissue infection and urinary tract infection was low in the 3 district hospitals in compared to Sekou Toure RRH and Bugando Medical Center underscoring a need to have health care facility tier' specific treatment guidelines.



	DHS	RRH	ZRH
Blood	12.5	52.4	47.3
Pus	11.4	36.4	56.2
Urine	9.7	8.3	45.9

Figure 5: Antimicrobial resistance patterns of Gram negative in the cascade of referral health care systems in Mwanza, Tanzania (n = 2,316). DHS – District Hospitals, RRH – Regional Referal Hospital, ZRH – Zonal Referal Hospital.

Source: The Supporting National Action Plan on AMR (SNAP-AMR) Technical Report to the MCC, October 2022.

2.4. Reduce the Incidence of Infection Through Effective Sanitation, Hygiene, and Infection Prevention Measures, and On-farm Biosecurity

Better hygiene and infection prevention measures are essential to limit the development and spread of antimicrobial resistant infections and multi-drug resistant pathogens. The third strategic objective recognizes the importance of reducing the incidence of infection through sanitation, hygiene and infection prevention measures.

A revised Standard Based Management – Recognition (SBM-R) tool for IPC supportive supervision has integrated in an Afya Supportive Supervision digital tool. The SBMR tool has been used in Tanzanian health facilities for supportive supervision and assessment, and recognizing best performance in health facilities since 2004. The tool has been revised with IPC standards and assessment criteria and is now more comprehensive and inclusive of all levels of health care delivery in human health. It has also been integrated in the MOH digital platform for supportive supervision (Afya SS).

The IPC guidelines have also been revised in line with WHO guidelines, and SOPs to assist in the implementation of IPC have been formulated, printed and disseminated. An IPC curriculum and training package has been developed and integrated into the national e-learning platform at the Center for Distance Education based in Morogoro. This guideline has now been accredited for Continuous Professional Education. Using this IPC guideline, mentorship was provided and training was conducted in two (2) national hospitals, three (3) zonal hospitals, 26 regional referral hospitals, 49 district hospitals, 62 health centers and eight (8) dispensaries. A total of 4883 health care workers have been trained using the training package as well as the SBMR tool.

A protocol for Health Care Associated Infections (HAIs) and surveillance tools for surgical site infections (SSIs) has been developed and disseminated to 136 health facilities. IPC key indicators have been developed, integrated in DHIS2 and disseminated to health care workers. Health facilities and councils have begun submitting reports based on these indicators.

From the Animal Health side, Regulations regarding import, export and registration of animal feeds were developed in 2020. The Animal Disease Vaccine and Vaccination Regulation 2020 was prepared and enacted. Annual vaccination calendars for 13 priority animal diseases have been developed, with vaccination for those diseases made mandatory. Furthermore, the Animal Disease (Acaricide Application and Management) Regulation 2020 was prepared, according to which dipping is mandatory. A total of 277 new dip tanks have been constructed and 854 dip tanks rehabilitated.

Further achievements included the procurement and distribution of 45,112.78 liters of acaricides and the dipping *(michovyo)* of 1,172,558,935 animals. To strengthen dipping programs, a dipping guideline was formulated and disseminated to all 185 LGAs. In addition, 1,883 animal dip tank committees have been established and operationalized.

Vaccination guidelines have been prepared and disseminated. Animal vaccination programs have been carried out to cover the following: Peste des Petits Ruminants (PPR) [13,928,484]; Contagious Bovine Pleuropneumonia (CBPP) [50,297,290]; Contagious Caprine Pleuropneumonia (CCPP) [182,000]; Anthrax [7,349,953]; Brucellosis [543,113]; Rabies [4,323,135]; Foot-and-Mouth Disease (FMD) [2,551,011]; and Newcastle disease (ND) [406824819]. Availability of vaccines has been enhanced through facilitation by the Tanzania Vaccines Institute (TVI) that is equipped with a new building for production of bacterial vaccines.

Strengthening National Linkages and Partnership for IPC has been achieved in Secondary school in Morogoro, Njombe and Iringa regions where teachers were taught how to prevent HIV among adolescent children when some component of IPC especially in relation to HIV was done. Also, during COVID-19 pandemic, communities were sensitized to wear masks, practice social distancing in public places, transport facilities as well as through partial lockdown. Hand washing/sanitization was insisted in all public places. Communities

have been educated about burials and bereavements as per IPC guidelines. Waste collection points for masks and other waste were installed in public places. Local expert participated in revising the global document of codex Alimentarius organized by FAO.

2.5 Optimize the Use of Antimicrobial Agents in Human, Animal and Plant Health

Health care facilities cannot operate without medicines, and a significant proportion of health care expenditures is most often committed to procuring medicines (which include antimicrobials). Rational use of antimicrobial agents is critical in ensuring appropriate utilization of resources, prevention of harmful effects related to misuse of antimicrobials, prevent development of AMR and ultimately increase longevity of antimicrobial agents. Given the escalating burden of AMR, it is therefore, pertinent to closely monitor antimicrobial consumption and use in human, animal and plant sectors in conformity with the policy, regulations and guidelines.

A total of seven policies, laws and guidelines on the use of antimicrobial agents in humans, animals, agriculture and fisheries were developed and disseminated for utilization during the NAP-AMR (2017-2022) implementation: They include:

i. Standard Treatment Guidelines/National Essential Medicine List (which includes also AWaRe categorization of antibiotics), 6th Edition 2021.

ii. Standard Treatment Guidelines for Animal Diseases, 2022

iii. Policy Guideline for Implementation Antimicrobial Stewardship, June 2020

iv. The Animal Diseases (Vaccine and Vaccination) Regulation, 2020

v. The Animal Diseases (Acaricides Application and Management) Regulation 2019

vi. The Pharmacy (Prescription Handling and Control) Regulation, 2020

vii. The Grazing-Land and Animal Feed Resources (import and Export of Animal Feed Resources) Regulations, 2021

vii. The Grazing-Land and Animal Feed Resources (Registration and Movement of Animal Feed Resources and products) Regulations, 2021.

Tanzania has successfully enrolled a total of 16 hospitals in the AMS program (10 under Ministry of Health and MTaPS program; 3 under Ministry of Health-WHO Program); and three under other programs. Evaluation of AMS implementation activities has successfully been done in the human sector using ten AMS core elements indicators (six WHO indicators and three Ministry of Health additional indicators) involving tertiary hospitals and RRHs. The overall AMS performance ranged from 40% to 84%.

The antimicrobial stewardship program has been established through training of 18 MoH staff and Subject Matter Experts. Training packages on AMS, STG/NEMLIT and MTC, development of Hospital Formulary, and Professional Ethics on prescribing and dispensing of antibiotics have been developed.

A total of 12 trainings involving 240 healthcare workers (doctors, pharmacists, nurses, and laboratory experts from 51 hospitals (14 Tertiary – National/ tertiary hospitals and RRHs/ Special), 28 RRHs and 141 Primary level health facilities (District/Council Hospitals, Health Centers and Dispensaries). These trainings were conducted by the MoH – WHO, MoH – USAID MTaPS, MoH-USAID MTaPS-Mzumbe University ECHO Virtual Sessions, FROHUN, and HPSS-Swiss TPH.

To facilitate consistency in the development of Hospital Formulary across hospitals, the Ministry of Health developed Tanzania Hospital Formulary Template, July 2022. The MoH has also piloted training on the development of Hospital Formulary in 9 council/district hospitals in Mtwara region in August 2022. This is anticipated to assess the feasibility of hospital formulary at primary levels.

The training on professional ethics on proper use of preserved antimicrobial agents (prescribing and dispensing of antibiotics) has been conducted in 14 Tertiary and 28 RRHs involving 240 clinicians, nurses and pharmaceutical and laboratory personnel; and in 141 primary level health facilities (District/Council Hospitals, Health Centers and Dispensaries) in Dodoma region involving.

Antimicrobial use surveys were conducted in human and animal's sectors. A total of thirteen surveys on antimicrobial prescription/use were conducted (12 in human and 1 animal sector) using standardised methodologies. Of these, nine are publications in peer reviewed journal, and four are technical reports. The methodology deployed were WHO PPS (n=4), Global PPS (n=2), WHO INRUD (n=2), and locally customised methods (n=5).

The animal survey on antibiotic use was conducted in four out of 184 (2.2%) district councils and followed WOAH methodology. The WHO PPS study conducted in six tertiary hospitals and RRHs (2020), indicated that antibiotics were used in 62.3% of admitted patients (n = 948). Antibiotics were used predominantly on children and surgical patients and they were largely in the Access group (97.9%). Use of culture and antimicrobial susceptibility testing to inform treatment remained extremely low (Seni *et al*., 2020)[2]

The WHO-PPS in targeted hospitals showed that despite high antibiotic usage among admitted patients (62.3%), Tanzania is still conforming to the WHO targets in the AWaRe Categorization of antibiotics. For example, utilization in the Access group was 97.9% (WHO target>62.0%), Watch group: 1.8% (WHO target: <28.0%) and Reserve group: 0.3% (WHO target<12.0%). Lastly, the National Standard Prescription was disseminated to all hospitals and is in use.

Table 2 below compare key performance indicators of AMS interventions in Dodoma region.

[2] *Seni, J., et al., 2020. Antimicrobial use across six referral hospitals in Tanzania: a point prevalence survey. BMJ Open 10, e042819. https://doi.org/10.1136/bmjopen-2020-042819*

Table 2: Comparison of the Key Performance Indicators at the Baseline (2012) and post-intervention (2021) in Dodoma Region using WHO-INRUD

Facility indicators (N=132)	2012	2021	p-value
Availability of NEMLIT	49%	74%	p-value<0.001
Availability of STG	49%	83%	p-value<0.001
Prescription Indicators (n-4150)	2012	2021	p-value
Average number of prescribed medicines per patient per encounter	1.9	2.2	NS*
Medicines prescribed which were dispensed	78%	75.3%	NS*
Medicines prescribed from STG/NEMLIT	98%	91%	NS*
Antibiotics prescribed	66%	81%	p-value<0.001
Medicines prescribed as generics	97%	64%	p-value<0.001
Percentage of injections	9%	14%	p-value<0.001
Patient care indicators (n=1254)	2012	2021	p-value
Average consultation time	4.2 min	8.9 min	NS*
Average dispensing time	39 sec	106 sec	NS*
Adequate labelling of prescriptions	1%	2.2%	NS*

Source: Health Promotion and System Strengthening (HPSS)-Swiss TPH Technical Report in Dodoma region., July 2022

NS*: Statistically not significant

A study assessed national antimicrobial consumption rates in the human sector between 2017-2019 (Mbwasi *et al*., 2020[3]) indicated a decrease in consumption of antibiotics from 136.4 defined daily dose (DDD) in 2017 to 55.0 and 51.0 in 2018 and 2019, respectively (Figure 6). Doxycycline, amoxicillin, and trimethoprimsulfamethoxazole were the most frequently consumed antibiotics during these years, accounting for 20.01, 16.75, and 12.42 DDD/1,000/D, respectively. Based on WHO AWaRe classification >90% of antibiotic consumption was Access group, with Watch and Reserve class medications accounting for <10% and <1%, respectively.

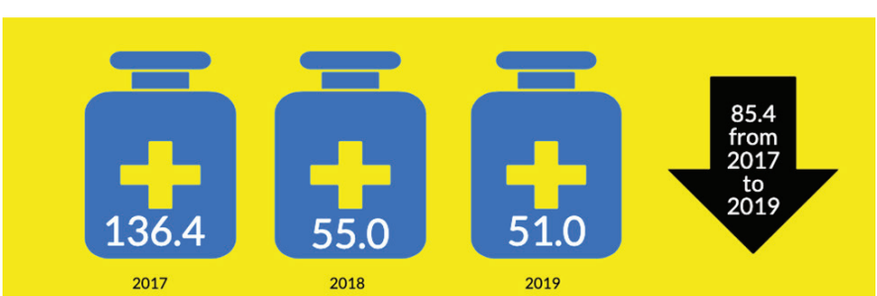


Figure 6: Reduction of DDD per 1000 population between 2017 –2019 in Tanzania (Mbwasi et al., 2020)

[3] *Mbwasi, R., et al., 2020. National Consumption of Antimicrobials in Tanzania: 2017–2019. Frontiers in Pharmacology 11*

A survey on consumption trend of veterinary antimicrobial in three years (2017-2019) showed that, a total of 20,693 tons were imported and tetracycline was the most antimicrobial group imported (Figure 7 below).

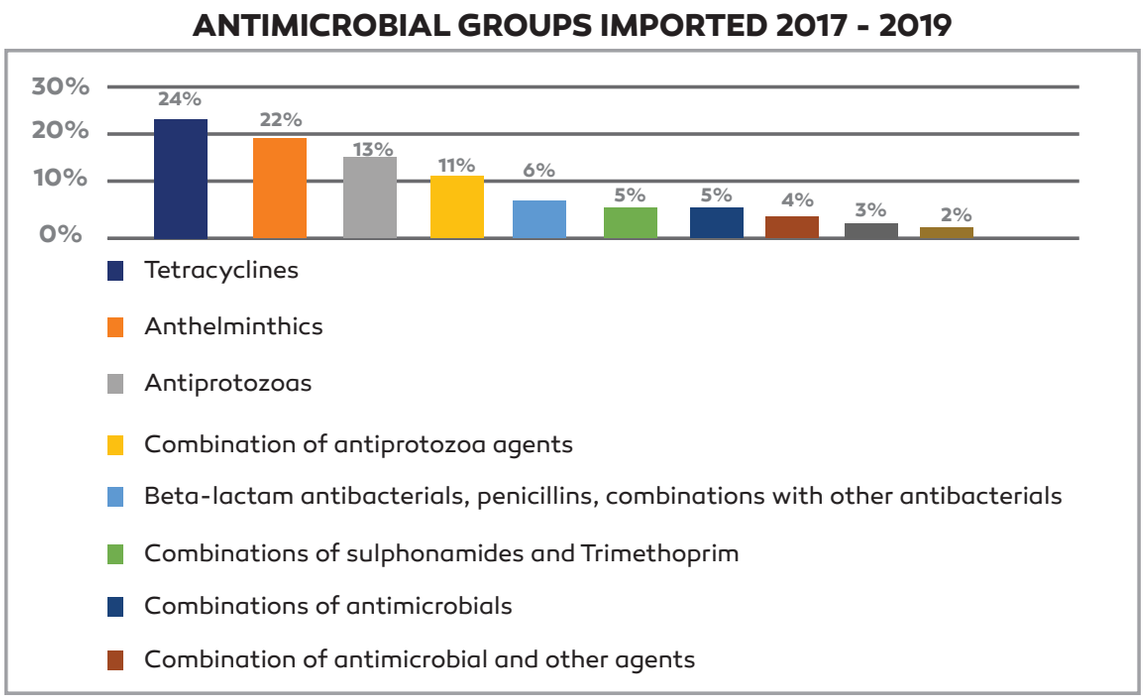


Figure 7: Consumption trends of veterinary antimicrobial in three years (2017-2019)

As per WHO AWaRe categorization, the the importation of Watch antibiotic in the animal sector has steadily increased over the years. In 2017 the Watch antibiotic imported were streptomycin and neomycin. In 2019, products containing Watch antibiotic included streptomycin, neomycin, norfloxacin and kanamycin. Also, the importation of Reserve antibiotics as veterinary drugs has steadily increased over the years e.g. the number of veterinary drug formulations containing colistin rose from one in 2017 to four in 2019.

Limited quantitative studies assessing antimicrobial residues have been conducted and published in Tanzania (Mwankuna *et al*., 2022[4]). This gap is recognized, especially in relation to food products (Mdegela *et al*., 2020[5]). To date, antimicrobial agents for testing residuals in different samples have been identified and included in the National Antimicrobial Resistance Surveillance Framework. These include five classes of antibiotics, namely tetracyclines, cephalosporins, aminoglycosides, sulfonamides, and macrolides.

2.6 Develop the Economic Case for Sustainable Investment

While acknowledging vast arrays of achievements, gaps and challenges attained during the implementation of the NAP-AMR (2017-2022), there are cross-cutting and overarching drivers of health inequalities which adversely impact on the burden of AMR requiring One Health Approach to be addressed (Figure 6). Similarly, availability of human resources, material resources (like diagnostic infrastructures and uninterrupted supplies of commodities for NAP-AMR implementation) and financial resources are required to be effectively and efficiently harnessed and coordinated to maximize attained of NAP-AMR implementation targets (Figure 8,9,& 10).

[4] *Mwankuna, C.J., et al., 2022. A HPLC-MS/MS method for screening of selected antibiotic adulterants in herbal drugs. Anal. Methods 14, 1060–1068. https://doi.org/10.1039/D1AY01966J*

[5] *Mdegela, R.H., et al., 2021. Antimicrobial Use, Residues, Resistance and Governance in the Food and Agriculture Sectors, Tanzania. Antibiotics 10, 454. https://doi.org/10.3390/antibiotics10040454*

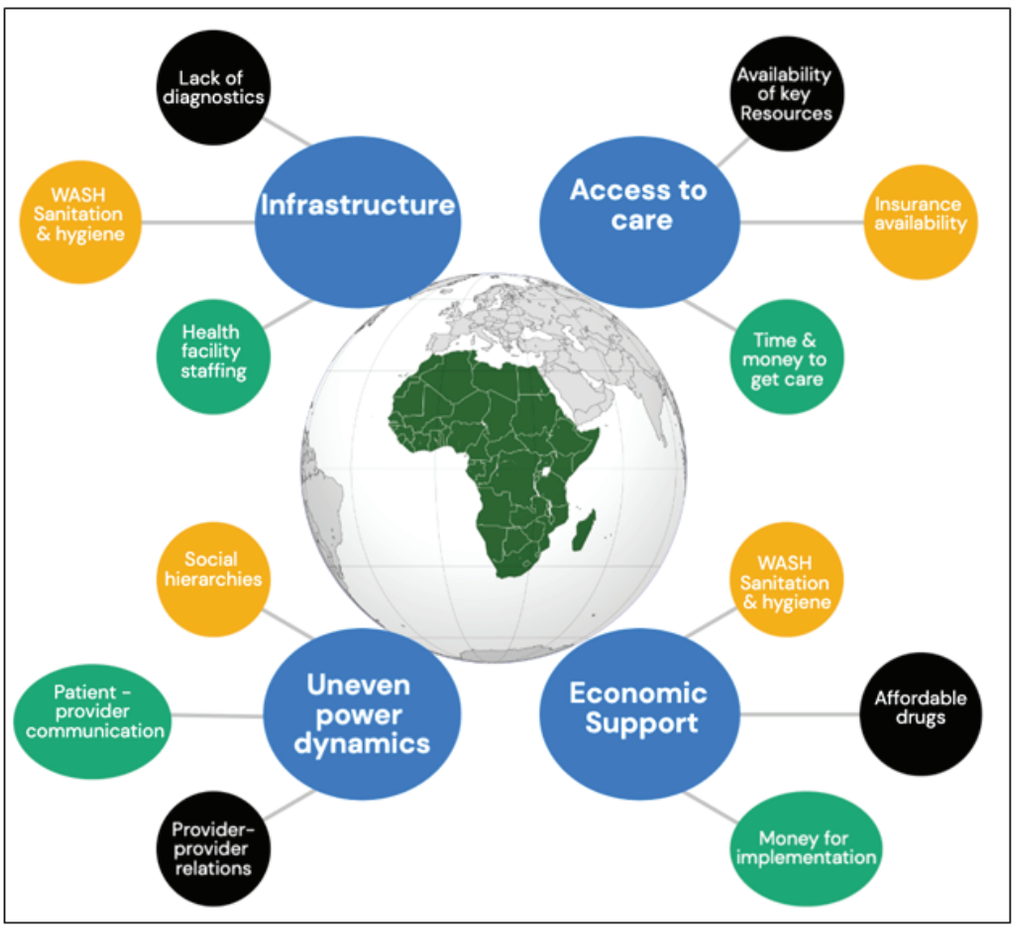


Figure 8: Drivers of Health Inequalities in Tanzania and Globally

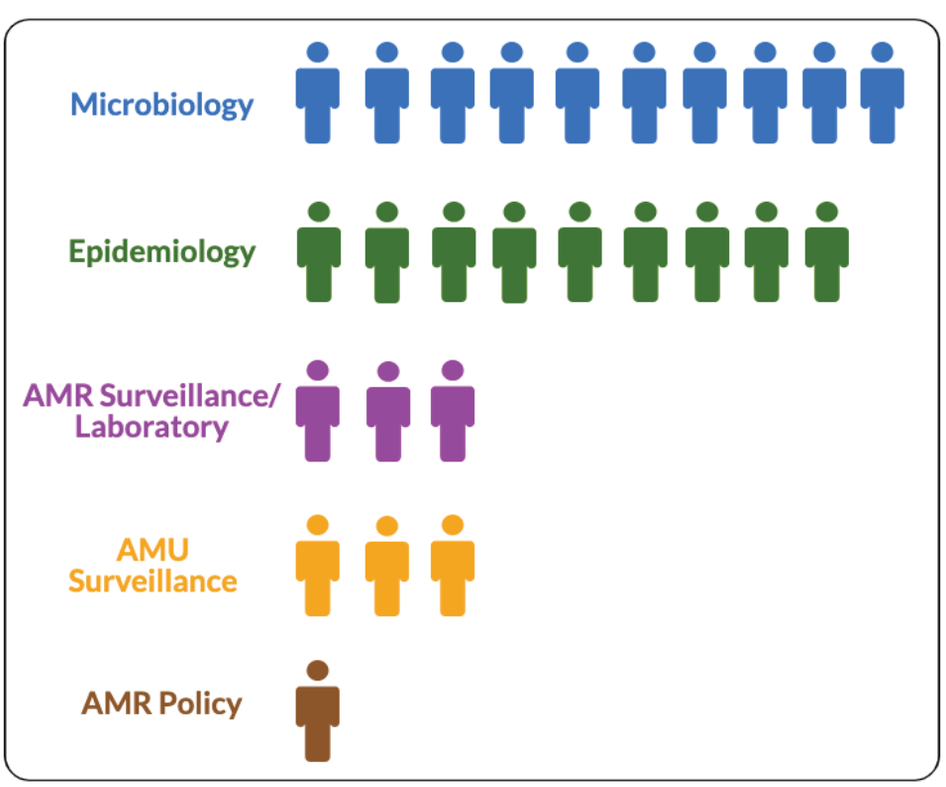


Figure 9: Human resource capacity in various AMR related fields from Fleming Fund support (n=26)

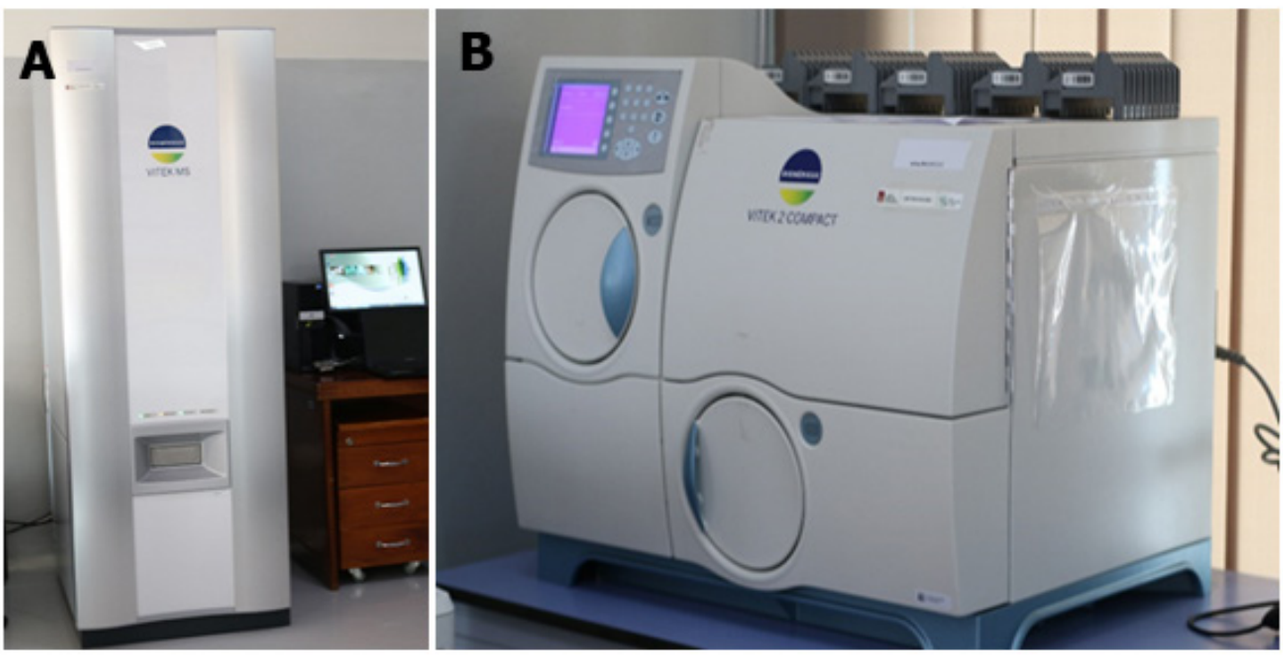


Figure 10: Improved Laboratory Capacity for Testing (A) Installed VITEK MS for pathogen identification, (B) Installed VITEK 2 COMPACT for AST

2.7 Analysis of Strengths, Weaknesses, Opportunities and Threats in the Implementation of NAP-AMR

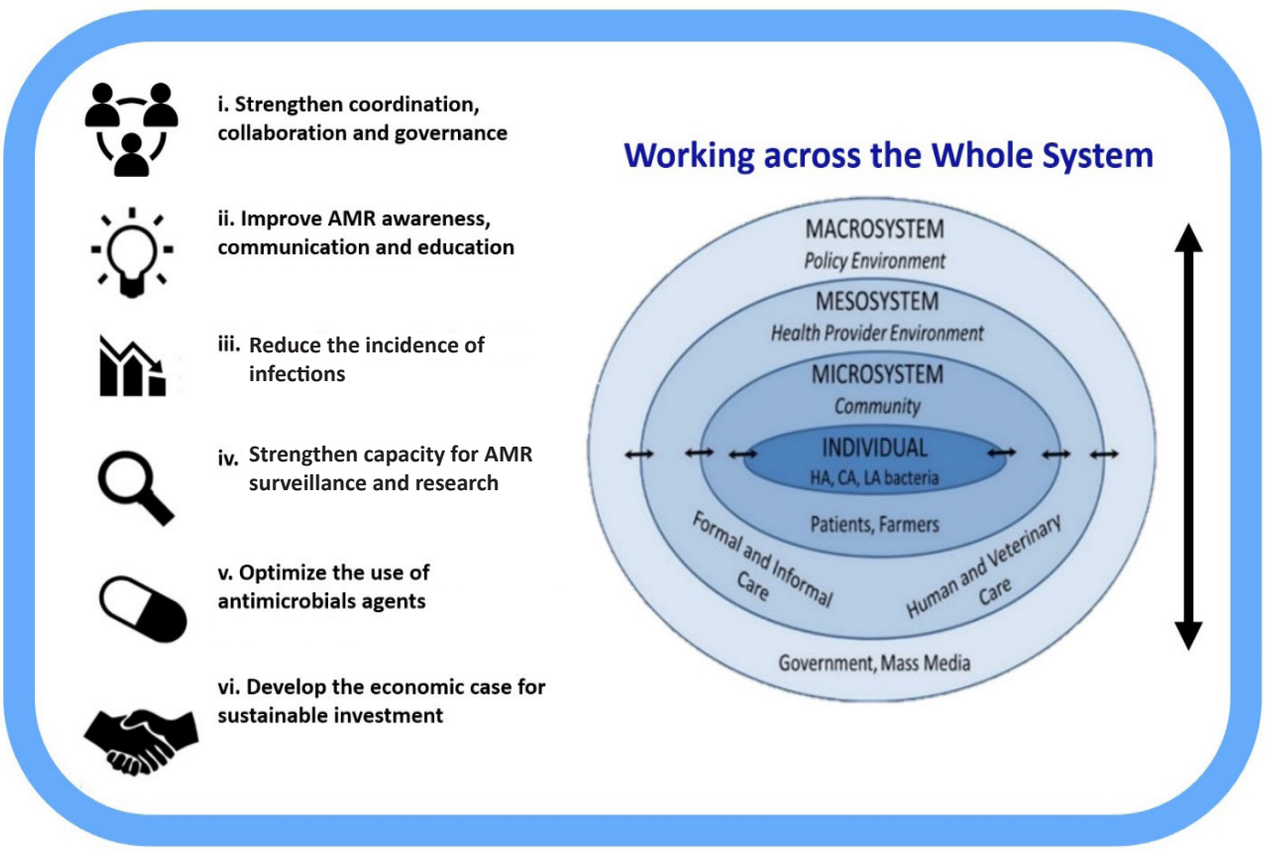
The strengths, weaknesses, opportunities and threats in the implementation of NAP-AMR 2023-2028 are summarized in table 3 below.

Table 3: SWOT Analysis Matrix

Strengths	Weaknesses
Governance: • Policies, laws and regulations in place at the national level • MCC for AMR, Secretariat, and four TWGs in place • Clear communication channels within and between responsible ministries • Good relationships with UN agencies, and local and international collaborating partners **Awareness and education:** • Existing AMR training, awareness and communication materials • Existing of local NGOs responsible for AMR awareness • Annual WAAW commemoration • Availability of AMR communication strategy • Availability of e-learning platforms for AMR, AMS and IPC in the human sector • Training curricula reviewed in universities and technical institutions to include AMR **Financial resources:** • Partners' commitment to support NAP-AMR related activities **Technical capacity:** • Existence of AMR surveillance, AMS and IPC guidelines and protocols related to human and animal health • Availability of subject matter experts in all TWGs • Laboratories implementing AMR surveillance enrolled and active in EQA programs **Implementation of NAP-AMR activities:** • National and international collaborations on-going and in development to implement and evaluate NAP-AMR activities **Monitoring and data:** • A wealth of published biomedical and social-science data on AMR in humans and animals health available • Incorporation of IPC indicators in DHIS 2 • Enrolment in WHO GLASS for AMR and AMC/AMU data • Existence of ten and six sentinel sites for human and animal health monitoring, respectively	**Governance:** • Lack of enforcement of policies, laws and regulations at sub-national level **Awareness and education:** • Lack of synthesis of KAPB studies • Lack of AMR and IPC training and materials based on Tanzanian data and context • Public campaigns do not always take account of local context and constraints • Inadequate planning and evaluation of communication campaigns • Lack of training curricula on AMR at primary and secondary school levels **Technical capacity:** • Lack of AMR surveillance guidelines and protocols related to food safety, plant and environmental health • Lack of on-farm biosecurity guidelines and protocols **Monitoring and data:** • Incomplete data on AMR-related morbidity, mortality and other health outcomes • Lack of data on economic impacts of AMR • Limited data on food safety, plant and environmental aspects of AMR • Limited AMR and AMU data-sharing mechanisms within and between institutions and sectors • Implementation of human AMR surveillance on two priority samples only (blood and urine)

Opportunities	Challenges
Governance: • Better integration with One Health Coordination desk under PMO • Professional bodies/councils available and responsible for CPDs **Awareness and education:** • AMR focal points to help coordinate communication activities • SNAP-AMR Staged Logic Model sensitized to help planning of campaigns • Professional bodies/councils to help guide the delivery of CPD • International organizations (WHO, FAO, WOAH, UNEP) commitment to support AMR awareness and education • Opportunities to improve patient-provider communication through training and sensitization **: Implementation of NAP-AMR activities:** • Opportunities to build new and existing partnerships for implementation and evaluation of NAP-AMR activities **Monitoring and data:** • Opportunities for integrated disease surveillance and response	**Awareness and education:** • Limited resources for awareness and education materials • Unfavorable context for behaviour change and resistance to change • Challenges in patient-provider communication **Financial resources:** • Inadequate financial resources for AMR activities **Technical capacity:** • Limited human resources for implementation of NAP-AMR related activities **Implementation of NAP-AMR activities:** • Reliance on international partner funding cycles and priorities for implementation

IMPLEMENTATION PLAN FOR THE NAP-AMR 2023-2028



Six key strategic Objectives and the system

STRATEGIC OBJECTIVE ONE
STRENGTHEN COORDINATION, COLLABORATION AND GOVERNANCE

Effective multisectoral coordination and collaboration require an effective governance structure across sectors. Key drivers and consequences of bacterial, viral, parasitic and fungal resistance to antimicrobial medicines are felt across the human and animal health, as well as the agriculture and environment sectors. Interventions to tackle antimicrobial resistance must be addressed in all these sectors through a coordinated One Health and multi-sectoral collaboration which in turn will be translated to sector-specific actions. Sector-specific activities and planning should be undertaken within each sector, acknowledging the need for collaborative work between sectors. Therefore, for the effective implementation of the National Action Plan on Antimicrobial Resistance 2023- 2028, a well-designed multi-sectoral coordination and collaboration structure presently existing at national level will be strengthened while cascading implementation of activities at sub-national levels.

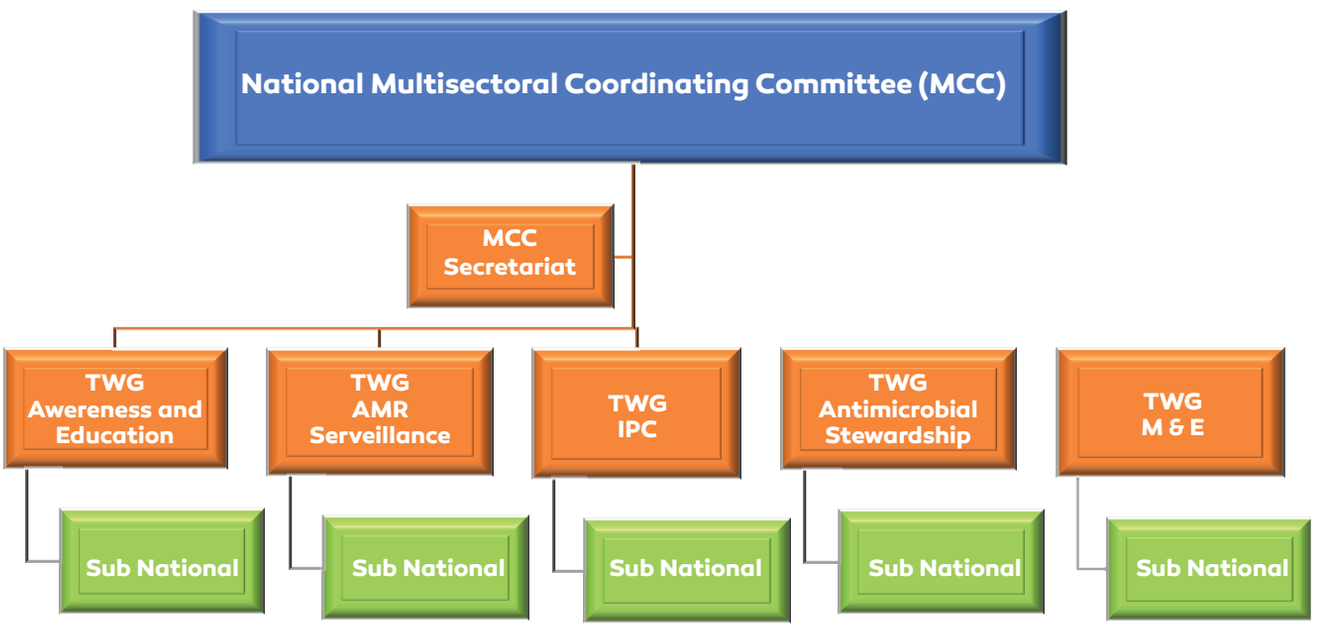


Figure 11: National Antimicrobial Resistance Governance Structure

3.1 The National AMR Multi-Sectoral Coordinating Committee (MCC)

Like other countries, the National Multi-Sectoral Coordinating Committee (MCC) on AMR remains the central National Steering Body and shall oversee and coordinate all AMR related activities in the country. The AMR Action plan operations shall be managed and implemented through the MCC under the Chairmanship of the Chief Medical Officer and Co-chaired by the Director of Veterinary Services.

Members of the MCC shall include representatives from sectors responsible for human and animal health, food safety production and the environment. Membership also includes Development Partners and International Organizations' including the World Health Organization (WHO), Food and Agriculture Organization (FAO), Centre for Disease Control and Prevention (CDC), World Organization for Animal Health (WOAH) and the United Nations Environmental Programme (UNEP).

The multi-sectoral coordinating committee plays a convening role in the involvement of all sectors including: public, private, academia, civil society, etc., as these groups have a crucial role in implementing and scaling up the NAP. In addition, it links with other relevant national/subnational committees. The terms of reference for the MCC is attached as appendix II.

3.2 The National AMR Multi-Sectoral Coordinating Committee Secretariat

The MCC needs to be supported by a dedicated multidisciplinary Secretariat. The MCC Secretariat shall coordinate meetings and support effective coordination and communication with all AMR stakeholders. The office for the MCC Secretariat needs to be established equipped and funded to enable it carry out its functions effectively. The members of the Secretariat will be nominated and approved by the MCC. The terms of reference for the MCC Secretariat are attached (appendix III).

3.3 Antimicrobial Resistance Focal Point

The AMR focal point for the health sector remains the Pharmaceutical Services Unit and the Directorate of Veterinary Services for animal sector. Also, other sectors may appoint a focal point for coordination of AMR activities. The terms of reference for AMR focal points is are attached as appendix IV.

3.4 Technical Working Groups

Five technical working groups will be strengthened to support and advise the MCC. The TWGS were established in the previous NAP and are based on the strategic objectives. However, for this edition of the NAP, the research agenda as a cross cutting issue, will be included in the terms of reference for each TWG. The TWGs comprise members who represent relevant sectors, including (but not limited to) human health; animal health; agriculture; food safety; education; environment, water, sanitation and hygiene (WASH). The MCC shall appoint Chairpersons for the five TWGs. Membership to TWGs will be nominated and approved by the MCC. The five technical working groups are as listed below:

i. AMR Awareness, effective communication and Education.
ii. Antimicrobial Surveillance.
iii. Hygiene and Infection Prevention and Control.
iv. Antimicrobial Stewardship.
v. Sustainable investment, Monitoring and Evaluation.

The terms of reference for the TWGs are attached as appendixes V, VI, VII, VIII and IX.

3.5 AMR Coordination at Sub-national levels

The governance structure for the implementation of NAP AMR at the sub-national level is insufficiently established with a perspective of the one health approach. At sub national level, AMR focal persons shall be appointed for specific sectors. Furthermore, the established health committees at Regional, Council and Ward levels shall be used to coordinate and collaborate with key stakeholders in the implementation of the National Action Plan on AMR 2023-2028. Membership to the committees shall consider one health approach in tackling AMR. In that regard, it is recommended to co-opt other members whenever AMR agenda will be tabled. The terms of reference for establishing AMR structure at sub national level shall be developed after an assessment.

3.6 Capacity building for effective coordination and governance on AMR

Leadership and managerial skills are needed to promote collaboration and coordinate the sustainable implementation of AMR NAPs within and across sectors and stakeholders. The MCC in collaboration with stakeholders shall perform a training needs assessment and eventually prepare a training package to enhance multisectoral coordination and governance including:

i. Building trust and promoting transparency in implementing NAP-AMR.

ii. Promoting ethics, values, accountability and equity on antimicrobial use and resistance.

iii. Mapping influence and persuasion goals, and understanding specific coalitions, their value, and how to influence them and work with partners towards mutual gains.

iv. Structuring commitments and managing alternatives for ongoing evaluation of multisectoral partnerships.

Operational Plan for Coordination, Collaboration and Governance

PRIORITY ACTION : COORDINATION, COLLABORATION AND GOVERNANCE								
Obejective 1.1 To strengthen coordination, collaboration and governance for the implementation of AMR								
Intervention 1.1.1 Establish and strengthen governance structures to tackle AMR								
Activity: 1.1.1.1 Strengthen an AMR governance structure at national level								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
1.1.1.1.1 Establish an office for National AMR coordination	MOH/MLF/MOA	1	1	National level	2023	National AMR office established	20,000,000	Gov/ Partners
1.1.1..1.2 Convene quarterly MCC meetings	MCC Secretariat	1	20	National	2023-2028	minutes and proceedings	498,266,170	Gov/ Partners
1.1.1.1.3 Convene quarterly AMR TWGs meeting	TWGs	5	20	National	2023-2028	minutes and proceedings	110,793,829	**Gov/ Partners**
1.1.1.1.4 Convene biannual AMR Sub-TWG meeting	TWGs/Sub TWG	5	10	National	2023-2028	minutes and proceedings	36,706,025	**Gov/ Partners**
1.1.1.1.5 Recruit competent personnel to facilitate AMR coordination	MCC Secretariat	3	5	National	2023-2028	HR reports	122,424,120	**Gov/ Partners**
1.1.1.1.6 Equip the office for National AMR coordination	MCC Secretariat	1	5	National	2023-2028	HR Reports	118,988,940	**Gov/ Partners**
1.1.1.1.7. Procure an office car	MCC Secretariat	1	1	National	2024	Procurement report	101,000,000	**Gov/ Partners**
Activity: 1.1.1.2. Establish an AMR governance structure at Sub national level								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
1.1.1..2.1 Establish AMR coordination mechanism at sub national level	MoH/MLF/MOA/ PORALG	1	1	Sub national	2023	Terms of Reference	0	**Gov/ Partners**
1.1.1.2.2 Nominate AMR Focal Persons at Regional and Council levels	MoH/MLF/MOA/ PORALG	1	1	Sub national	2023	Appointment letters with ToRs	46,164,095	**Gov/ Partners**
1.1.1.2.3 Convene biannual AMR coordination meeting at sub national level and submit report to MCC	MoH/MLF/MOA/ PORALG	2	5	Sub national	2023-2028	minutes and proceedings	276,474,471	**Gov/ Partners**

1.1.1.2.4 Regular AMR and AMC data analysis and reporting	TWG	2	5	National	2023-2028	Data analysis report.	229,545,225	Gov/ Partners
Activity:1.1.1.3. Conduct training on AMR, One Health, governance and coordination								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
1.1.1.3.1. Conduct need assessment on governance, coordination at national and sub national levels	MCC Secretariat	1	8	National /Sub	2023	Assessment report	83,760,000	Gov/ Partners
1.1.1.3.2. Prepare training material for AMR coordination and governance	MCC Secretariat	1	1	National /Sub	2023	Training materials	78,694,410	Gov/ Partners
1.1.1.3.3. Conduct training for National and sub national AMR coordination leaders	MCC Secretariat	3	1	National /Sub	2023-2028	Training report	138,024,085	Gov/ Partners
1.1.1.3.4. Participate in National, Regional and international meetings/ workshops/scientific conferences	MCC Secretariat	4	5	National	2023-2028	Meeting/ Workshop report	229,545,225	Gov/ Partners
Intervention 1.1.2 Strengthen communication and collaborations on AMR								
1.1.2.1 Develop a web-based portal to share AMR surveillance publication and other information								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
1.1.2.1.1 Conduct coordination meetings to develop a web-based portal	MoH	1	3	National	2023	Meeting report	13,090,248	Gov/ Partners
1.1.2.1.2 Identify developer of the web portal	MoH	1	1	National	2023	ToR for web development	12,200,000	Gov/ Partners
1.1.2.1.3 Launching the web portal	MoH	1	1	National	2023	Launching report	2,000,000	Gov/ Partners
1.1.2.1.4 Maintaining the web portal	MoH	5	5	National	2023	Web maintenance report	10,000,000	Gov/ Partners

1.1.2.2 Advocate for strategies to increase the national budget contribution to One Health AMR interventions								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
1.1.2.2.1 Conduct meetings with budget officers from responsible ministries	MoH/MLF/VPO/ MoA	5	5	National/Sub national	2023-2028		55,000,000	Gov/ Partners
1.1.2.2.2. Sensitize Member of Parliament to support AMR agenda	MoH/MLF/VPO/ MoA	5	5	National/Sub national	2025-2028		250,000,000	Gov/ Partners
Intervention 1.1.3 Monitor and evaluate NAP-AMR 2023 – 2028								
1.1.3.1 Conduct baseline survey of NAP - AMR 2023-2028								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
1.1.3.1.1 Meeting to review AMR report of 2017 - 2022	MoH/MoLF/MoA	Meeting	1	National	2023	Meeting report	40,625,000	Gov/ Partners
1.1.3.1.2 Workshop to develop data collection tools to capture baseline results	MoH/MoLF/MoA	Workshop	1	National	2023	Data collection tools workshop report	22,500,000	Gov/ Partners
1.1.3.1.3 Conduct baseline survey	MoH/MoLF/MoA	Survey	1	National	2023	Field report	224,406,994	Gov/ Partners
1.3.1.4 Conduct workshop to analyze data and write baseline report	MoH/MoLF/MoA	Workshop	1	National	2023	Baseline survey report	45,213,500	Gov/ Partners
1.1.3.2 Conduct monitoring of NAP - AMR 2023-2028								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
1.1.3.2.1. Develop Monitoring Framework for annual operational plan	MoH/MoLF/MoA	1	1	National	2023	Training materials	44,017,500	Gov/ Partners
1.1.3.2.2 Conduct AMR monitoring	MoH/MoLF/MoA	4	5	National	2023-2028	Field visit report	240,000,000	Gov/ Partners
1.1.3.2.3 Prepare M & E report and submit to MCC	MoH/MoLF/MoA	1	5	National	2023-2028	M& E report	0	Gov/ Partners

1.1.3.3 Conduct evaluation of NAP - AMR 2023-2028								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
1.1.3.3.1 Conduct midterm evaluation	MoH/MoLF/MoA	1	1	National	2025	Evaluation report	125,000,000	Gov/ Partners
1.1.3.3.2 Conduct end term evaluation	MoH/MoLF/MoA	1	1	National	2028	Evaluation report	125,000,000	Gov/ Partners
1.1.3.4 Document best practices of NAP – AMR								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
1.1.3.4.1 Preparation of terms of reference (ToR) to engage consultant	MoH/MoLF/MoA	Meeting	1	National	2028	ToR document	0	Gov/ Partners
1.1.3.4.2 Consultant to present inception report	MoH/MoLF/MoA	Meeting	1	National	2028	Inception report	36,060,535	Gov/ Partners
1.1.3.4.3 Conducting documentary of NAP – AMR 2023 -2028	MoH/MoLF/MoA		1	National	2028	Documentary report	57,000,000	Gov/ Partners

STRATEGIC OBJECTIVE TWO
IMPROVE AMR AWARENESS, COMMUNICATION AND EDUCATION

The causes of AMR are complex and different in low-and-middle income countries (LMICs) compared to high-income countries (HICs). Therefore, developing communications around AMR can be challenging and approaches used in certain contexts may not apply to others. Overall challenges around AMR communication relate to the fact that it is a multi-faceted problem spanning a range of health issues, from surgery to the management of chronic diseases, and the treatment and prevention of infectious diseases.

Furthermore, AMR is often an invisible problem with multiple drivers and affecting multiple systems, including humans, animal, agriculture and the environment. AMR is still a new concept to explain and understand especially for the public. These complexities can result in conflicting and confusing messages that are not understood. Finally, global messages around AMR sometimes may have limited adaptations to specific local situations and audiences. Therefore, tailoring information to the Tanzanian audiences in human health, animal health, the environment and agricultural practice as well as consumers is essential, and this information should be developed based on the specific context within which it is going to be used.

Steps need to be taken to raise awareness of antimicrobial resistance and promote behavioral change, through public communication programmes that target different audiences in human, animal, environmental and plant health. Similarly, there is need to establish AMR knowledge Management and sharing mechanisms at all levels (e.g. Data bases, Websites, symposium etc.).

The pandemic left positive legacies that normalized mask usage and handwashing which will help prevent the transmission of many different infectious diseases. Now, there is a need to increase efforts to include AMR multisectoral coordination in line with the One Health approach, expand efforts to include all of the strategic objectives and fully acknowledge that sex and gender impacts need to be understood to contain antimicrobial resistance. Body weight, blood volume, and fat distribution differences between sexes have biological effects on how antibiotics are absorbed, distributed, metabolized, and eliminated[6]. This is one of the reasons that females have more Adverse Drug Events (ADE) and more frequently suffer from AMR than males.

Making antimicrobial resistance as core component of professional education, training, certification, continuing education and development in the health, animal, environmental sectors and agricultural and food chain practice, will help to ensure proper understanding and awareness among professionals. At the same time the inclusion of the use of antimicrobial agents and resistance in school curricula will promote better understanding and awareness from an early age. In order to achieve these, a list of priority actions, objectives, interventions need to be addressed through implementation of planned activities of this strategic plan. The priority action in this strategic objective are as follows: awareness-raising and risk communication and education

[6] *Soldin OP, Mattison DR. Sex differences in pharmacokinetics and pharmacodynamics. Clin Pharmacokinet. 2009;48(3):143–57. doi: http:// dx.doi .org/ 10 .2165/ 00003088 -200948030 -00001 PMID: 19385708*

STRATEGIC OBJECTIVE 2

PRIORITY ACTION: AWARENESS-RAISING AND RISK COMMUNICATION

OBJECTIVE; INCREASE NATIONAL AWARENESS ON AMR

Interventions	Activities
2.1.1 Establish an evidence-based public communications on AMR targeting human, animal and plant including food chain.	2.1. 1.1. Conduct a systematic review of KAPB studies to determine the country status in all sectors
	2.1.1.2 Translate and disseminate a communication strategy for AMR
2.1.2. Advocate for AMR and Conduct campaigns	2.1.2.1 Conduct commemoration of the World Antimicrobial Awareness Week, other campaigns and exhibitions (including Nane Nane)
	2.1.2.2 Conduct Training of Trainers (TOTs) at National, Regional and Council level on AMR
	2.1.2.3 Conduct sensitization meetings to private and public stakeholders at National, Regional and Council levels on AMR
	2.1.2.4 Conduct multimedia awareness campaigns on AMR
2.1.3 Develop knowledge sharing mechanism at all levels (web portal, social media handles and mobile apps)	2.1.3.1 Establish AMR knowledge Management and sharing mechanism at all levels

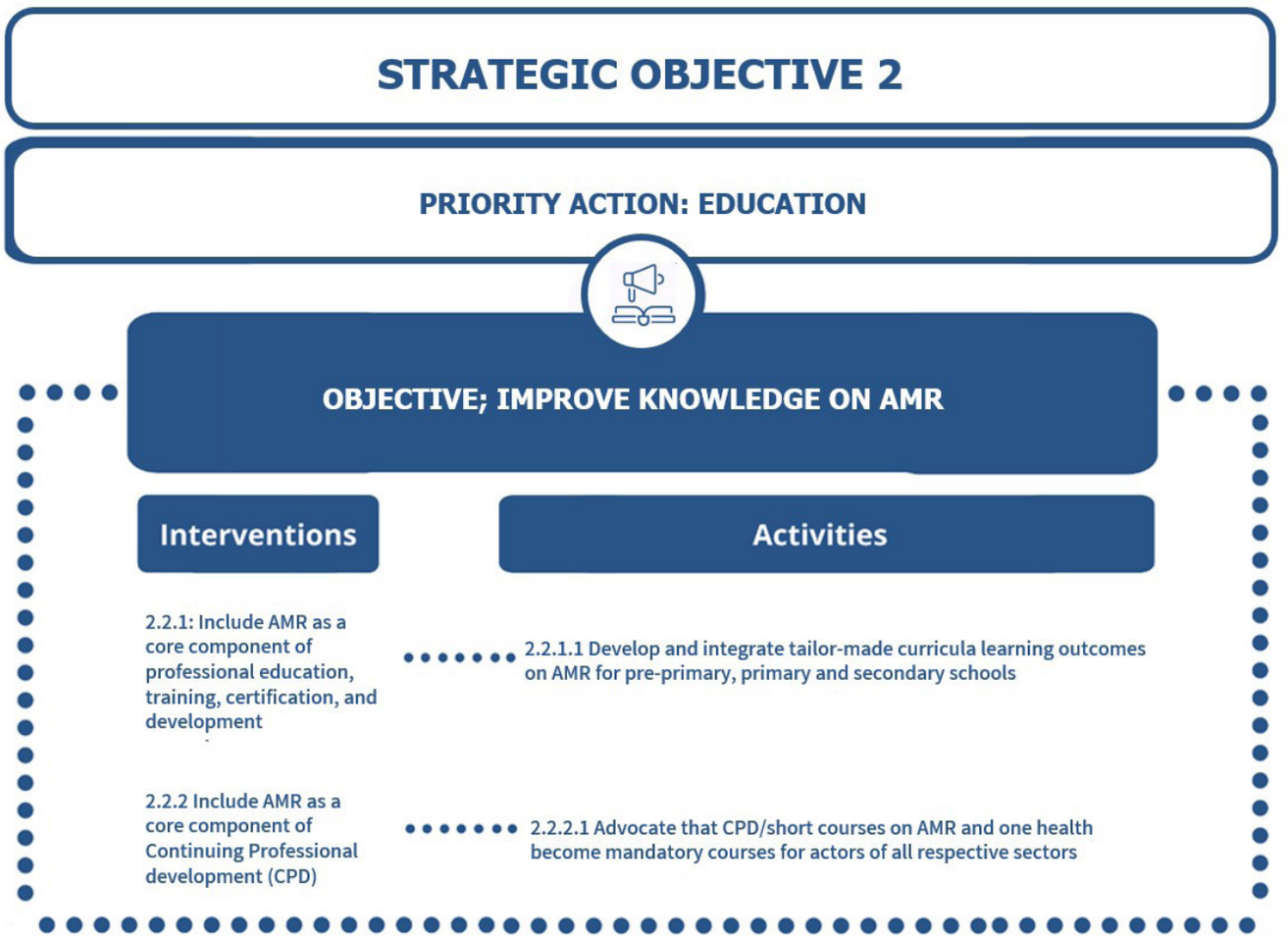
Operational Plan for Awareness-Raising and Risk Communication

PRIORITY ACTION : AWARENESS-RAISING AND RISK COMMUNICATION								
Objective 2.1 Increase national awareness on AMR								
Intervention 2.1.1 Establish an evidence-based public communications on AMR targeting human, animal and plant including food chain.								
Activity: 2.1. 1.1. Conduct a systematic review of KAPB studies to determine the country status in all sectors								
Sub-activity	**Implementing entity**	**Unit**	**quantity**	**Implementation level (national/ sub national)**	**Timeline**	**Output indicator**	**cost**	**Funding source**
2.1.1.1.1 Conduct systematic review of studies in all sectors to identify gaps (population, cadres, professionals, sectors, geographic areas etc.)	MOH/MLF/ MoA/VPO	Survey	5	National level	2023-2024	reports and public cations	114,029,000	Gov/Partners
2.1.1.1.2 Conduct KAP studies in areas that systematic review has found gaps including incentives and barriers to behavioral change.	MOH/MLF/ MoA/VPO	Survey	5	National level	2024-2028	reports and publications	50,000,000	Gov/Partners
2.1.1.1.3 Conduct a meeting to disseminate KAP study findings	MOH/MLF/ MoA/VPO	Meeting	2	National level	2024-2028	minutes and proceedings	86,961,000	Gov/Partners
2.1.1.1.4 Develop guideline on how the studies on KAPB -be conducted	MOH/MLF/ MoA/VPO	Meeting	2	National level	2023	Guideline	53,988,800	Gov/Partners
2.1.1.1.5 Conduct studies on behavioral change communication (BCC)	MOH/MLF/ MoA/VPO	Survey	5	National level	2024-2028	reports and publications	16,515,419	Gov/Partners
Activity: 2.1.1.2 Translate and disseminate a communication strategy for AMR and other relevant AMR documents								
Sub-activity	**Implementing entity**	**Unit**	**quantity**	**Implementation level (national/ facility/ community)**	**Timeline**	**Output indicator**	**cost**	**Funding source**
2.1.1.2.1 Conduct a workshop to disseminate/unpack simplified Tailor-made version of the communication strategy for each specific actor	MOH/MLF/ MoA/VPO/ PORALG	Workshop	1	National level	2023-2024	Minutes and proceedings	143,300,000	Gov/Partners

2.1.1.2.2 Translate communication strategy into Kiswahili	MOH/MLF/ MoA/VPO/ PORALG	Person/ firm	1	National level	2023-2024	Swahili version of the AMR communication strategy	25,000,000	Gov/Partners
2.1.1.2.3 Conduct a workshop to disseminate translated simplified version of the communication Strategy	MOH/MLF/ MoA/VPO/ PORALG	Workshop	1	National level	2024-2025	Minutes and proceedings	66,963,150	Gov/Partners
Intervention 2.1.2. Advocate for AMR and Conduct campaigns								
Activity: 2.1.2.1 Conduct commemoration of the World Antimicrobial Awareness Week and other relevant national and international ceremonies/exibitions								
Sub-activity	**Implementing entity**	**Unit**	**quantity**	**Implementation level (national/ facility/ community)**	**Timeline**	**Output indicator**	**cost**	**Funding source**
2.1.2.1.1 Develop a harmonized tool for conduction of pre and post surveys.	MOH/MLF/ MoA, / VPO/ PORALG	Survey	5	National & Subnational	2023-2028	reports	52,600,000	Gov/Partners
2.1.2.1.2 Conduct a pre and post survey of activities (campaigns) conducted during the WAAW	MOH/MLF/ MoA/VPO/ PORALG	Survey	5	National & Subnational	2023-2028	reports	20,404,020	Gov/Partners
2.1.2.1.3 Prepare and issue activation circular on AMR to all sectors at different levels during the WAAW	MOH/MLF/ MoA, / VPO/ PORALG	Circular	5	National & Subnational	2023-2028	Activation circular	144,500,000	Gov/Partners
2.1.2.1.4 Conduct multilevel advocacy workshops for commemorating the AMR week through existing structures including the private sector	MOH/MLF/ MoA, / VPO/ PORALG	Workshop	1	National & Subnational	2023-2028	minutes and proceeding	144,307,431	Gov/Partner Partners
2.1.2.1.5 Develop and disseminate BCC and IEC materials on AMR during the WAAW	MOH/MLF/ MoA, / VPO/ PORALG	Copies, TV sports,	1	National & Subnational	2023-2028	materials developed and distributed	25,505,025	Gov/Partners
2.1.2.1.6 Conduct workshops to sensitize FBO's, influential people and members of the private sector to participate during the WAAW	MOH/MLF/ MoA, / VPO/ PORALG	Workshop	1	National & Subnational	2023-2028	minutes and proceeding	276,228,537	Gov/Partners

2.1.2.1.7 Commemorate the World Antimicrobial Awareness Week (WAAW) and AMR exibitions at national and subnational level	MOH/MLF/ MoA, / VPO/ PORALG	Symposium/ Campaigns	1	National & Subnational	2023-2028	minutes and pro-ceeding	510,100,501	Gov/Partners
Activity: 2.1.2.2 Conduct Training of Trainers (TOTs) at National, Regional and Council level on AMR								
Sub-activity	**Implementing entity**	**Unit**	**quantity**	**Implementation level (national/ facility/ community)**	**Timeline**	**Output indicator**	**cost**	**Funding source**
2.1.2.2.1 Conduct workshop to train AMR TOTs on AMR at national levels	MOH/MLF/ MoA, / VPO/ PORALG	Workshop	1	National & Subnational	2023-2024	minutes and pro-ceeding	109,080,000	Gov/Partners
2.1.2.2.2 Conduct workshops to train AMR trainers at council level	MOH/MLF/ MoA, / VPO/ PORALG	Workshop	5	National & Subnational	2023-2028	minutes and pro-ceeding	903,902,025	Gov/Partners
2.1.2.2.3 Conduct implementation survey of AMR TOT's trainings at council level	MOH/MLF/ MoA, / VPO/ PORALG	Survey	1	National & Subnational	2027-2028	reports	60,063,488	Gov/Partners
Activity: 2.1.2.3 Conduct sensitization meetings to private and public stakeholders at National, Regional and Council levels on AMR								
Sub-activity	**Implementing entity**	**Unit**	**quantity**	**Implementation level (national/ facility/ community)**	**Timeline**	**Output indicator**	**cost**	**Funding source**
2.1.2.3.1 Conduct sensitization meetings to private and public stakeholders at National, Regional and Council levels on AMR	MOH/MLF/ MoA, / VPO/ PORALG	Meeting	3	National	2023-2025	proceedings and reports	241,163,578	Gov/Partners
2.1.2.3.2 Conduct sensitization meetings to private and public stakeholders at National, Regional and Council levels on AMR	MOH/MLF/ MoA, / VPO/ PORALG	Meeting	3	Subnational	2023-2025	proceedings and reports	201,203,555	Gov/Partners
2.1.2.3.3 Conduct sensitization meetings to private and public stakeholders at National, Regional and Council levels on AMR	MOH/MLF/ MoA, / VPO/ PORALG	Meeting	3	Subnational	2023-2025	proceedings and reports	358,157,820	Gov/Partners

Activity: 2.1.2.4 Conduct multimedia awareness campaigns on AMR								
Sub-activity	**Implementing entity**	**Unit**	**quantity**	**Implementation level (national/ facility/ community)**	**Timeline**	**Output indicator**	**cost**	**Funding source**
2.1.2.4.1 Identify multimedia channels/agencies	MOH/MLF/ MoA, / VPO/ PORALG	Meeting	5	National & Subnational	2023-2028	proceedings and reports	40,606,020	Gov/Partners
2.1,2.4.2 Involve media in Preparing AMR awareness materials	MOH/MLF/ MoA, / VPO/ PORALG	Meeting	5	National & Subnational	2023-2028	proceedings and reports		
2.1.2.4.3 Print AMR awareness materials	MOH/MLF/ MoA, / VPO/ PORALG	1	5	National & Subnational	2023-2028	Availability of AMR awareness materials	406,060,000	Gov/Partners
2.1.2.4.4 Conduct campaigns on AMR	MOH/MLF/ MoA, / VPO/ PORALG	Campaign	5	National & Subnational	2023-2028	proceedings and reports	255,050,250	Gov/Partners
Intervention 2.1.3. Develop knowledge sharing mechanism at all levels (web portal, social media handles and mobile apps)								
Activity: 2.1.3.1 Establish AMR knowledge Management and sharing mechanism at all levels								
Sub-activity	**Implementing entity**	**Unit**	**quantity**	**Implementation level (national/ facility/ community)**	**Timeline**	**Output indicator**	**cost**	**Funding source**
2.1.3.1.1 Develop a web portal linked to social media handles containing multilevel materials on AMR	MOH/MLF/ MoA, / VPO/	web portal	1	National & Subnational	2026-2028	Web portal	40,740,000	Gov/Partners
2.1.3.1.2 Conduct a workshop to develop multilevel materials on AMR for knowledge sharing	MOH/MLF/ MoA, / VPO/ PORALG	Workshop	2	National & Subnational	2026-2028	proceedings and reports	5,000,000	Gov/Partners


STRATEGIC OBJECTIVE 2
PRIORITY ACTION: EDUCATION
OBJECTIVE; IMPROVE KNOWLEDGE ON AMR
Interventions
Activities
2.2.1: Include AMR as a core component of professional education, training, certification, and development
2.2.1.1 Develop and integrate tailor-made curricula learning outcomes on AMR for pre-primary, primary and secondary schools
2.2.2 Include AMR as a core component of Continuing Professional development (CPD)
2.2.2.1 Advocate that CPD/short courses on AMR and one health become mandatory courses for actors of all respective sectors

Operational Plan for Education								
PRIORITY ACTION : EDUCATION								
Objective 2.2: Improve knowledge on AMR								
Intervention 2.2.1: Include AMR as a core component of professional education, training, certification, and development								
Activity: 2.2.1.1 Develop and integrate tailor-made curricula learning outcomes on AMR for pre-primary, primary and secondary schools								
Sub-activity	**Implementing entity**	**Unit**	**quantity**	**Implementation level (national/ facility/ community)**	**Timeline**	**Output indicator**	**cost**	**Funding source**
2.2.1.1.1 Conduct workshop to orient educational policy makers, REO's and DEO's on One health and AMR	MOH/MLF/ MoA/VPO/ MoE	Workshop	3	National level	2026-2028	proceedings and reports	179,987,940	Gov/Partners
2.2.1.1.2 Develop and integrate tailor-made curricula learning outcomes on AMR for pre-primary, primary and secondary schools	MOH/MLF/ MoA, / VPO/ MoE	List of curricula learning outcomes	2	National level	2026-2028	proceedings, reports, and number of curricula integrated	51,712,000	Gov/Partners
2.2.1.1.3 Develop and integrate AMR & One health concept learning outcomes in teachers training curriculum at all levels	MOH/MLF/ MoA, / VPO/ MoE	List of curricula learning outcomes	2	National level	2026-2028	proceedings, reports, and number of curricula integrated	52,229,120	Gov/Partners
Intervention 2.2.2 Include AMR as a core component of Continuing Professional development (CPD)								
Activity: 2.2.2.1 Advocate that CPD/short courses on AMR and one health become mandatory courses for actors of all respective sectors								
2.2.2.1.1 Conduct workshop to orient professional councils on the importance of adding AMR and one health as mandatory CPD requirements	MOH/MLF/ MoA, / VPO/ MoE	Workshop	1	National level	2023-2024	Workshop report	0	Gov/Partners
2.2.2.1.2 Develop face to face and online AMR and one health course for all respective actors	MOH/MLF/ MoA, / VPO/ MoE	short courses	2	National level	2027-2028	list of short courses developed	84,436,000	Gov/Partners
2.2.2.1.3 To upload One health and AMR learning materials to the e-learning platform	MOH/MLF/ MoA, / VPO/ MoE	materials	4	National level	2024-2028	Training report	5,050,000	Gov/Partners

STRATEGIC OBJECTIVE THREE
STRENGTHEN CAPACITY FOR AMR SURVEILLANCE AND RESEARCH

Surveillance of antimicrobial resistance and use is vital in combating AMR. Thus, in 2018 Tanzania developed the National Antimicrobial Resistance Surveillance Framework in the context of one health, which addresses challenges associated with AMR through effective monitoring of pathogens, antimicrobial susceptibility testing, antimicrobial residues testing, and enhancing the prudent use of antimicrobials through the communication of outcomes to the public. The National Antimicrobial Resistance Surveillance Framework enables standardized, comparable, and validated data on AMR/AMC/AMU to be collected, analysed, and shared to inform decision-making, drive local and national actions, and provide evidence for action and advocacy.

Laboratory-based AMR surveillance is required to monitor emergencies and the spread of antimicrobial resistance. For reliable microbiological and antimicrobial susceptibility testing, it is imperative to equip laboratories with equipment, reagents, and human resource. Develop Standard Operating Procedures (SOPs) and methodologies for surveillance of AMR in humans, animals, food, agriculture, aquaculture, and environment consistent and harmonized with international standards. Other initiatives for effective AMR surveillance include strengthening the system for AMC/AMU surveillance, capacity of national reference laboratories and designated laboratories for AMR surveillance, developing a multisectoral reporting system, and strengthening and supporting a coordinated mechanism to ensure harmonized AMR/AMC/AMU guidelines, data management, and information-sharing systems.

Strategic objective three aims to generate the knowledge and evidence needed through surveillance and research to identify emerging and re-emerging AMR issues and inform best practices for slowing down AMR and guiding policy using the One Health approach. The interventions under surveillance and research include surveillance system for AMR, AMC and AMU, laboratory capacity and research and development.

PRIORITY ACTION : SURVEILLANCE SYSTEM								
Objective 3.1: Strengthen National Surveillance System for Antimicrobial Resistance								
Intervention 3.1.1. Develop or review guiding documents for AMR Surveillance								
Activity: 3.1.1.1. Review the existing National AMR surveillance framework.								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.1.1.1.1 Conduct a situational analysis to guide the review of the National AMR surveillance framework	MOH, MoLF, PORALG, VPO, MoA	workshop	1	National	2023	Workshop Report and Documents	328,498,985	Govt/Partner
3.1.1.1.2 Organize stakeholders meeting to review the existing National AMR surveillance framework	MOH, MoLF, PORALG, VPO, MoA	meeting	2	National	2023	Report and Documents	292,622,615	Govt/Partners
3.1.1.1.3 Conduct stakeholders' meeting to validate the revised National AMR surveillance framework	MOH, MoLF, PORALG, VPO	meeting	1	National	2023	Report and Documents	34,400,000	Govt/Partner
3.1.1.1.4 Produce and disseminate the final revised National AMR surveillance framework	MOH, MoLF, PORALG, VPO	workshop	9	National	2023	Documents produced	28,150,000	Govt/Partner

Activity: 3.1.1.2. Develop protocols and standard operating procedures (SOPs) for AMR surveillance in human, animal, food, agriculture, aquaculture, and environment								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.1.1.2.1 Develop missing protocols for AMR surveillance in human, animal, food, agriculture, aquaculture, and environment	MOH, MoLF, PORALG, VPO	workshop	6	National	2023-2028	Workshop report	139,200,000	Govt/Partner
3.1.1.2.2 Conduct workshops to develop SOPs for AMR surveillance in human, animal, food, agriculture, aquaculture, and the environment.	MOH, MoLF, PORALG, VPO	workshop	6	Sub-national	2023-2028	Report and Documents	139,200,000	Govt/Partner
3.1.1.2.3 Validate developed protocols and SOPs for AMR surveillance	MOH, MoLF, PORALG, VPO	laboratory	6	Facility	2023-2028	Report and Documents	34,400,000	Govt/Partner
3.1.1.2.4 User training on developed SOPs for AMR surveillance	MOH, MoLF, PORALG, VPO	training	6	Facility	2023-2028	Report and Documents	25,050,000	Govt/Partner
Intervention 3.1.2. Conduct AMR surveillance in human, animal, food, agriculture, aquaculture, and environment								
Activity: 3.1.2.1 Collect samples for AMR surveillance								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.1.2.1.1 Training on quantification of sample collection material for AMR surveillance	MOH, MoLF, PORALG, VPO, MoA	Training	4	National	2023-2028	Report and Documents	50,350,500	Govt/Partner
3.1.2.1.2 Procure sample collection materials for AMR active surveillance	MOH, MoLF, PORALG, VPO	sites	24	sub-national	2023-2028	Report and Documents, Material	76,670,635	Govt/Partner
3.1.2.1.3 Train personnel on sample collection and sampling techniques for AMR active surveillance	MOH, MoLF, PORALG, VPO	training	12	Sub-national	2023-2028	Report and Documents	3,856,359,788	Govt/Partner
3.1.2.1.4 Conduct field visits for AMR active surveillance sample collection in human, animal, food, agriculture, aquaculture, and environment	MOH, MoLF, PORALG, VPO, MoA	visit	36	facility	2023-2028	Report and Documents	33,666,633	Govt/Partner

Activity: 3.1.2.2 Package and transport collected samples to designated laboratories for AMR surveillance								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.1.2.2.1 Identify courier and develop a memorandum of understanding for AMR active surveillance sample transportation	MOH, MoLF, PORALG, VPO,MoA	contract	1	facility	2023-2028	contract	612,120	Govt/Partner
3.1.2.2.2 Train personnel on sample packaging and transportation	MOH, MoLF, VPO, PORALG, MoA	training	12	Sub-national	2023-2028	Report and Documents	612,120	Govt/Partner
Intervention 3.1.3 Develop a multisectoral AMR surveillance reporting system								
Activity: 3.1.3.1 Develop and operationalize a multisectoral AMR surveillance reporting system								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.1.3.1.1 Collect and compile information on pre-existing reporting systems across sectors for AMR surveillance.	MOH, MoLF, PORALG, VPO, MoA	Sectors	5	National	2023-2028	Report and Documents	9,350,000	Govt/Partner
3.1.3.1.2 Conduct stakeholders' meetings to identify the mechanism of interoperability of the AMR surveillance reporting system	MOH, MoLF, PORALG, VPO	meeting	3	National	2023-2028	Report and Documents	76,670,635	Govt/Partner
3.1.3.1.3 Develop an integrated AMR surveillance reporting system across all sectors	MOH, MoLF, PORALG, VPO	developer	2	National	2023-2028	Reporting system	27,000,000	Govt/Partner
3.1.3.1.4 Conduct a stakeholders' meeting to validate the AMR surveillance reporting system	MOH, MoLF, PORALG, VPO	meeting	2	National	2023-2028	Report and Documents	17,545,720	Govt/Partner
3.1.3.1.5 Launch AMR surveillance multisectoral AMR surveillance reporting system	MOH, MoLF, PORALG, VPO, MoA	workshop	1	National	2023-2028	Report and Documents	24,896,500	Govt/Partner

Intervention 3.1.4. Strengthen AMC and AMU surveillance in human, animal, aquaculture, and agriculture								
Activity 3.1.4.1 Conduct regular AMC/AMU surveys on selected antimicrobial agents in human and animal sectors.								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.1.4.1.1 Identify areas for AMC/AMU survey on selected antimicrobial agents	MOH, MoLF, PORALG, VPO	Meeting	1	Sub-national	2023-2028	Report and Documents	110,400,000	Govt/Partner
3.1.4.1.2 Adopt and customize the existing methodology for the AMC survey	MOH, MoLF, PORALG, VPO	Meeting	3	Sub-national	2023-2028	Protocol document	25,000,000	Govt/Partner
3.1.4.1.3 Train personnel on AMC/AMU data collection	MOH, MoLF, PORALG, VPO	Training	4	Sub-national	2023-2028	Training report	334,213,550	Govt/Partner
3.1.4.1.4 Conduct field visits for AMC/ AMU data collection, analysis, and reporting	MOH, MoLF, PORALG, VPO	Visit	10	Sub-national	2023-2028	Survey reports	670,000,000	Govt/Partner
3.1.4.1.5 Disseminate AMC/AMU survey findings through existing mechanisms.	MOH, MoLF, PORALG, VPO	Meeting	5	Sub-national	2023-2028	Finding report	277,280,226	Govt/Partner
3.1.4.1.6 Capacitate the designated institutions for AMC/AMU data management.	MOH, MoLF, PORALG, VPO, TBS	Institutions	5	National	2023-2028	Report and Documents	120,000,000	Govt/Partner
Intervention 3.1.5. Strengthen surveillance of antimicrobial residual								
Activity 3.1.5.1. Review antimicrobial agents for residual surveillance in foods of animal and nplant origin and environment.								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.1.5.1.1 Conduct stakeholders meeting to identify antimicrobial agents for residual surveillance	MOH, MoLF, PORALG, VPO	meeting	4	National	2023-2028	Meeting report		Govt/Partner
3.1.5.1.2 Disseminate the list of selected antimicrobial agents for residual surveillance.	MOH, MoLF, PORALG, VPO	stakeholders	1	National	2023-2028	Report and Documents		Govt/Partner

Activity: 3.1.5.2 Identify, assess, and support laboratories for testing antimicrobial residuals in food, aquaculture, and environment.								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.1.5.2.1 Conduct laboratory capacity assessment using a standardized tool	MOH, MoLF, PORALG, VPO	laboratory	5	National	2023-2024	Assessment report	34,744,000	Govt/Partner
3.1.5.2.2 Conduct a stakeholders' meeting to disseminate assessment findings and select the laboratories for testing antimicrobial residuals.	MOH, MoLF, PO-RALG, VPO	meeting	1	National	2023-2024	List of identified laboratories	15,301,500	Govt/Partner
Activity: 3.1.5.3 Develop and harmonize SOP and methods of testing the antimicrobial residual.								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.1.5.3.1 Conduct workshop to develop SOPs for antimicrobial residual testing	MOH, MoLF, TBS, PORALG, VPO	workshop	3	National	2023-2024	SOPs document	6,666,000	Govt/Partner
3.1.5.3.2 Validate the developed SOPs for antimicrobial residual testing	MOH, MLF, PORALG, VPO	workshop	3	National	2023-2028	Report and Documents	10,504,000	Govt/Partner
3.1.5.3.3 User training on developed SOPs for antimicrobial residual testing	MOH, MLF, PORALG, VPO	laboratory	5	Sub-national	2023-2028	Report and Documents	48,379,000	Govt/Partner
Activity: 3.1.5.4 Build technical and infrastructural capacity in the identified laboratories for antimicrobial residual testing.								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.1.5.4.1 Prepare a training package for antimicrobial residual testing.	MOH, MoLF, PORALG, VPO	workshop	5	National	2023-2028	Training packages developed	17,372,000	Govt/Partner
3.1.5.4.2 Conduct TOT training for antimicrobial residual testing	MOH, MoLF, PORALG, VPO	Training	1	National	2023-2028	Report and Documents	26,260,000	Govt/Partner
3.1.5.4.3 Roll out the training pack-age to the personnel in the identified laboratories for antimicrobial residual testing	MOH, MoLF, PORALG, VPO	Laboratory	10	Su-national	2023-2028	Report and Documents	234,000,000	Govt/Partner
3.1.5.4.4 Provide infrastructure and equipment support for the identified laboratories	MOH, MoLF, PORALG, VPO	Laboratory	5	Sub-national	2023-2028	Report and Documents	909,000,000	Govt/Partner

3.1.5.4.5 Conduct regular mentorship in the identified laboratories for antimicrobial residual testing.	MOH, MoLF, PORALG, VPO	Mentorship	45	Sub-national	2023-2028	Report and Documents	157,110,955	Govt/Partner
3.1.5.4.6 Conduct regular supportive supervision in the identified laboratories for antimicrobial residual testing.	MOH, MoLF, PORALG, VPO	Mentorship	45	Sub-national	2023-2028	Report and Documents	566,822,656	Govt/Partner
Activity: 3.1.5.5 Collect and transport of samples for antimicrobial residual surveillance								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.1.5.5.1 Training on quantification of materials for antimicrobial residual surveillance.	MOH, MoLF, PORALG, VPO	training	5	National	2023-2028	Report and Documents	25,300,000	Govt/Partner
3.1.5.5.2 Procurement of materials for antimicrobial residual surveillance	MOH, MoLF, PORALG, VPO	laboratory	5	Sub-national	2023-2028	Report and Documents	505,000,000	Govt/Partner
3.1.5.5.3 Train personnel on sample management for antimicrobial residual surveillance	MOH, MoLF, PORALG, VPO	training	4	Sub-national	2023-2028	Report and Documents	25,300,000	Govt/Partner
3.1.5.5.4 Conduct field visits for sample collection and transportation	MOH, MoLF, PORALG, VPO	visit	30	Sub-nation	2023-2028	Report and Documents	11,221,656	Govt/Partner

STRATEGIC OBJECTIVE 3

PRIORITY ACTION: LABORATORY CAPACITY

OBJECTIVE; BUILD LABORATORY CAPACITY TO PRODUCE HIGH-QUALITY MICROBIOLOGICAL DATA

Interventions	Activities
3.2.1. Designate and strengthen Laboratories for AMR surveillance in agriculture, aquaculture, foods, and the environment.	3.2.1.1 Assess the existing laboratories' capacity and select one laboratory to be a national reference laboratory for AMR surveillance in agriculture, food, aquaculture, and the environment.
3.2.2. Capacity building for designated laboratories for AMR surveillance in human, animal, food, agriculture, aquaculture, and environment.	3.2.2.1 Conduct training, mentorship, and supportive supervision for personnel on diagnostics and antimicrobial susceptibility testing. 3.2.2.2. Support transportation of priority isolates to reference laboratories and biorepositories
3.2.3 Strengthen the supply chain system to support laboratory AMR surveillance	3.2.3.1. Review and update the master list for the materials/ reagents/ items required for AMR surveillance and supply mechanism to ensure constant availability 3.2.3.2. Building capacity of staff at the designated laboratory for AMR surveillance on supply chain management
3.2.4 Strengthen quality management system for designated laboratories for AMR surveillance.	3.2.4.1. Assess and enroll designated laboratories for AMR surveillance on the EQA program 3.2.4.2. Support reference laboratories to coordinate and distribute EQA materials for AMR surveillance 3.2.4.3. Support accreditation process to designated laboratories for AMR surveillance

Operational Plan for Laboratory Capacity

PRIORITY ACTION : LABORATORY CAPACITY								
Objective 3.2: Strengthen Laboratory capacity to produce high-quality microbiological data management								
Intervention 3.2.1. Designate and strengthen Laboratories for AMR surveillance in agriculture, aquaculture, foods, and the environment.								
Activity: 3.2.1.1. Assess the existing laboratories' capacity and select one laboratory to be a national reference laboratory for AMR surveillance in agriculture, food, aquaculture, and the environment.								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
3.2.1.1.1 Develop/adopt laboratory capacity assessment tools	MOH, MoLF, PORALG, VPO	workshop	2	National	2023-2028	Report and Documents	19,076,814	Govt/ Partners
3.2.1.1.2 Conduct laboratory capacity assessment for AMR surveillance in food safety, agriculture, aquaculture, and the environment.	MOH, MoLF, PORALG, VPO	Laboratory	8	Sub-national	2023-2028	Report and Documents	6,666,000	Govt/ Partner
3.2.1.1.3 Conduct a meeting to appoint surveillance sites and reference laboratories in food safety, agriculture, aquaculture, and the environment.	MOH, MoLF, PORALG, VPO	meeting	2	National	2023-2028	Report and Documents	10,504,000	Govt/ Partner
3.2.1.1.4 Conduct sensitization meetings on AMR surveillance to stakeholders from food safety, agriculture, aquaculture, and the environment.	MOH, MoLF, PORALG, VPO	Meeting	4	Sub-national	2023-2028	Report and Documents	185,460,301	Govt/ Partner
3.2.1.1.5 Renovate appointed reference laboratories in food safety, aquaculture, agriculture, and the environment.	MOH, MoLF, PORALG, VPO	Laboratory	4	Facility	2023-2028	Report and Documents	404,000,000	Govt/ Partner
3.2.1.1.6 Support placement of advanced equipment to appointed reference laboratories in food safety, aquaculture, agriculture, and the environment.	MOH, MoLF, PORALG, VPO	Laboratory	4	Facility	2023-2028	Report and Documents	2,020,000,000	Govt/ Partner

Intervention 3.2.2. Capacity building for designated laboratories for AMR surveillance in human, animal, food, agriculture, aquaculture, and environment.									
Activity: 3.2.2.1. Conduct training, mentorship, and supportive supervision for personnel on diagnostics and antimicrobial susceptibility testing.									
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level**	**Timeline**		**Output Indicator**	**Cost**	**Funding Source**
3.2.2.1.1 Conduct a baseline assessment for laboratory capacity on diagnostics and antimicrobial susceptibility testing.	MOH, MoLF, PORALG, VPO	Laboratory	24	National	2023-2024	Assessment report	6,732,993	Govt/Partner	
3.2.2.1.2. Conduct training on laboratory techniques for pathogen identification and antimicrobial susceptibility testing, including AMR-priority pathogens.	MOH, MoLF, PORALG, VPO	Laboratory	24	Sub-national	2023-2028	Report and Documents	142,004,950	Govt/Partner	
3.2.2.1.3 Conduct training of laboratory personnel on AMR data management and analysis.	MOH, MoLF, PORALG, VPO	Laboratory	24	Sub-national	2023-2028	Report and Documents	102,730,175	Govt/Partner	
3.2.2.1.4 Conduct regular supportive supervision of selected laboratories on AMR surveillance.	MOH, MoLF, PORALG, VPO	Laboratory	24	Su-national	2023-2028	Report and Documents	142,004,950	Govt/Partner	
3.2.2.1.5 Conduct regular mentorship programs for selected laboratories on AMR surveillance.	MOH, MoLF, PORALG, VPO	Laboratory	24	Sub-national	2023-2028	Report and Documents	102,730,175	Govt/Partner	
3.2.2.1.6 Conduct training of laboratory personnel on biosafety, biosecurity, and isolate management	MOH, MoLF, PORALG, VPO	Training	6	National	2023-2028	Report and Documents	142,004,950	Govt/Partner	
Activity: 3.2.2.2. Support transportation of priority isolates to reference laboratories and biorepositories									
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level**	**Timeline**		**Output Indicator**	**Cost**	**Funding Source**
3.2.2.2.1 Establish bio banking of AMR isolates at reference laboratories.	MOH, MoLF, PORALG, VPO	laboratory	2	National	2023-2028	Report and Documents	707,000,000	Govt/Partner	
3.2.2.2.2 Support a contract agreement for selected courier on transportation of AMR isolates to national reference laboratories.	MOH, MoLF, PORALG, VPO	contract	1	National	2023-2028	Report and Documents	10,202,010	Govt/Partner	

Intervention 3.2.3 Strengthen the supply chain system to support laboratory AMR surveillance								
Activity: 3.2.3.1. Review and update the master list for the materials/ reagents/ items required for AMR surveillance and supply mechanism to ensure constant availability.								
Sub-activity	**Implementing entity**	**Unit**	**quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.2.3.1.1 Conduct a meeting with technical personnel to review the master list for the materials/ reagents/ items required for AMR surveillance in relevant sectors.	MOH, MoLF, PORALG, VPO	Meeting	5	Sub-national	2023-2028	Report and Documents	35,093,177	Govt/Partner
Activity: 3.2.3.2. Building capacity of staff at the designated laboratory for AMR surveillance on supply chain management								
Sub-activity	**Implementing entity**	**Unit**	**quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.2.3.2.1 Conduct training on the quantification and forecasting of AMR surveillance commodities	MOH, MoLF, PORALG, VPO	training	5	National	2023-2028	Report and Documents	51,109,540	Govt/Partner
3.2.3.2.2 Train laboratory personnel on the management of eLMS	MOH, MoLF, PORALG, VPO	Training	10	Sub-national	2023-2028	Report and Documents	51,109,540	Govt/Partner
3.2.3.2.3 Support on availability of bacteriological reagents and supplies for testing	MOH, MoLF, PORALG, VPO	Laboratory	24	Facility	2023-2028	Report and Documents	9,339,322,277	Govt/Partner
Intervention 3.2.4. Strengthen quality management system for designated laboratories for AMR surveillance.								
Activity: 3.2.4.1. Assess and enroll designated laboratories for AMR surveillance on the EQA program								
Sub-activity	**Implementing entity**	**Unit**	**quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.2.4.1.1 Conduct a meeting to identify the EQA scheme provider to enroll AMR surveillance laboratories.	MOH, MoLF, PORALG, VPO	Meeting	2	National	2023-2028	Report and Documents	10,504,000	Govt/Partner
3.2.4.1.2 Assess designated laboratories for participation in the EQA program.	MOH, MoLF, PORALG, VPO	Assessment	12	Facility	2023-2028	Report and Documents	3,333,000	Govt/Partner
3.2.4.1.3 Support distribution of EQA materials to designated laboratories.	MOH, MoLF, PORALG, VPO	Laboratory	36	Facility	2023-2028	Report and Documents	1,020,201,002	Govt/Partner

Activity: 3.2.4.2. Support reference laboratories to coordinate and distribute EQA materials for AMR surveillance								
Sub-activity	**Implementing entity**	**Unit**	**quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.2.4.2.1 Conduct training to reference laboratories on PT production and distribution.	MOH, MoLF, PORALG, VPO	Training	2	Facility	2023-2028	Report and Documents	15,251,000	Govt/Partner
3.2.4.2.2 Support procurement of materials necessary for production and distribution of PT Materials	MOH, MoLF, PORALG, VPO	laboratory	2	National	2023-2028	Report and Documents	2,040,402,004	Govt/Partner
Activity: 3.2.4.3. Support accreditation process to designated laboratories for AMR surveillance								
Sub-activity	**Implementing entity**	**Unit**	**quantity**	**Implementation level**	**Timeline**	**Output indicator**	**cost**	**Funding source**
3.2.4.3.1 Train laboratory staff on ISO 15189 for QMS.	MOH	Training	4	National	2023-2028	Report and Documents	51,109,540	Govt/Partner
3.2.4.3.2 Support mentorship program on ISO 15189 for QMS	MOH	Laboratory	24	Facility	2023-2028	Report and Documents	19,190,000	Govt/Partner
3.2.4.3.3 Support mentorship program on ISO 17043 for EQA production	MOH, MoLF, PORALG, VPO	Laboratory	2	Facility	2023-2028	Report and Documents	157,110,955	Govt/Partner
3.2.4.3.4 Support designated laboratories for accreditation on ISO 15189 for QMS	MOH	Laboratory	24	Facility	2023-2028	Report and Documents	117,323,115	Govt/Partner
3.2.4.3.5 Support Reference laboratories on ISO 17043 for EQA production.	MOH, MoLF, PORALG, VPO	Laboratory	2	Facility	2023-2028	Report and Documents	52,000,000	Govt/Partner


STRATEGIC OBJECTIVE 3
PRIORITY ACTION: RESEARCH AND DEVELOPMENT
OBJECTIVE; STRENGTHEN RESEARCH AND DEVELOPMENT IN ADRESSING AMR
Interventions
Activities
3.3.1: Integrate AMR in their respective sectoral research agenda
3.3.1.1: Engage relevant stakeholders to identify current gaps in knowledge and potential research topics
3.3.1.2: Develop national research guidelines on AMR
3.3.1.3: Conduct AMR research activities
3.3.1.4 Establish and operationalize the national bio-bank as source of isolates for AMR research in the country
3.3.2: Establish and support a framework for dissemination, storage and sharing of AMR research findings
3.3.2.1 Identify and utilize different approaches for dissemination of AMR research findings
3.3.2.2 Establish policy guidelines to address AMR data security and sharing in the country
3.3.2.3 Establish and sustain a national AMR data repository

Operational Plan for Research and Development

PRIORITY ACTION : RESEARCH AND DEVELOPMENT								
Objective 3.3: Strengthen research and development in addressing antimicrobial resistance								
Intervention 3.3.1: Integrate AMR in their respective sectoral research agenda								
Activity: 3.3.1.1: Engage relevant stakeholders to identify current gaps in knowledge and potential research topics								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
3.3.1.1.1 Identify current gaps in AMR research in sectors and institutions	MoH, MLF, MoA, VPO, PMO, NEMC, GCLA, research and academic Institutions	Workshop	1	Nationwide	Feb-23	A workshop being conducted	27,000,000	Gov/Partners
3.3.1.1.2 Formulate and agree on the priority research topics and issues to be integrated in Research agenda	MoH, MLF, MoA, VPO, PMO, NEMC, GCLA, research and academic institutions	Workshop	2	Nationwide	Mar-23	Number of workshops conducted	45,200,000	Gov/Partners
Activity: 3.3.1.2: Develop national research guidelines on AMR								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
3.3.1.2.1 Develop AMR research guidelines	MoH, MLF, MoA, MoIT, VPO, PMO, research and academic institutions	Workshop	2	Nationwide	Jul-23	Number of workshops conducted	55,020,000	Gov/Partners
3.3.1.2.2 Develop the Standards Operating Procedures (SOP) for AMR research	MoH, MLF, MoA, MoIT, VPO, PMO, research and academic institutions	Workshop	2	Nationwide	Jul-23	Number of workshops conducted	36,200,000	Gov/Partners
3.3.1.2.3 Validate the developed SOPs for AMR research	MoH, MLF, MoA, MoIT, VPO, PMO, research and academic institutions	Workshop	2	Nationwide	Jul-23	Number of workshops conducted	19,550,000	Gov/Partners
3.3.1.2.4 User training on developed SOPs for AMR research	MoH, MLF, MoA, MoIT, VPO, PMO, research and academic institutions	Workshop	2	Nationwide	Jul-23	Number of workshops conducted	24,430,000	Gov/Partners
3.3.1.2.5 Printing and dissemination of AMR guidelines	MCC	Professional conferences, Media coverage	6	Nationwide	Jul-23	Number of copies produced, Number of conferences attended	134,980,000	Gov/Partners

Activity: 3.3.1.3: Conduct AMR research activities								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
3.3.1.3.1 Map the stakeholders and their capacities and to conduct AMR researches	MoH, MLF, MoA, MoIT VPO, PMO, research and academic institutions	Desk reviews/ Surveys	4	Nationwide	2023-2024	Number of reviews conducted Number of surveys conducted	1,500,000,000	Gov/Partners
3.3.1.3.2 Sensitize stakeholders and donors to conduct and support AMR research across sectors	MoH, MLF, MoA, MoIT VPO, PMO, research and academic institutions	Seminars/ Workshops	4	Nationwide	2023-2024	Number of work-shops conducted	39,100,000	
3.3.1.3.3 To facilitate acquisition of baseline data to support big grant applications.	MoH, MLF, MoA, MoIT VPO, PMO, research and academic institutions	Research projects	10	Nationwide	2023-2024	Number of re-search projects conducted	30,580,000	Research and Academic In-stitutions/Gvt
3.3.1.3.4 Develop AMR related research proposals with one health approach in response to calls.	MoH, MLF, MoA, MoIT VPO, PMO, Research and Academic Institutions, NGOs	Workshop	10	Nationwide	2023-2028	Number of propos-als developed	20,000,000	Gov/Partners
3.3.1.3.5 Implement research projects on AMR.	Research and Academic Insti-tutions etc.			Nationwide	2023-2028	Amount of data generated and analysed	0	Gov/Partners
3.3.1.3.6 Conduct stakeholders meeting to track the implementation of AMR research	MoH, MLF, MoA, VPO, NEMC	Workshop	5	Nationwide	May-23	A workshop being conducted	133,500,000	Gov/Partners
Activity: 3.3.1.4 Establish and operationalize the national bio-bank as source of isolates for AMR research in the country								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
3.3.1.4.1 Selection of one referral laboratory to be national biobank of isolates for AMR research	MoH, MLF, MoA, MoIT, VPO	Meeting	1	Nationwide	Jul-23	The meeting being conducted	0	Gov/Partners
3.3.1.4.2 Conduct a needs assessment of the selected laboratory to serve as a National Biobank	MoH, MLF, MoA, MoIT, VPO			National Biobank	Jul-23	Needs assessment conducted	13,600,000	Gov/Partners

3.3.1.4.3 Identify institutions/ sites to provide isolates for AMR research	MoH, MLF, MoA, MoIT, VPO			Nationwide	Jul-23	The meeting being conducted	0	Gov/Partners
3.3.1.4.4 Support the National Biobank with equipment, facilities and supplies	MoH, MLF, MoA, MoIT, VPO			National Biobank	Jul-23	Support extended to the laboratory	324,000,000	Gov/Partners
3.3.1.4.4 Operationalize the biobank	MoH, MLF, MoA, MoIT, VPO			National Biobank	Jul-23	A working biobank	20,780,000	Gov/Partners
Priority Intervention 3.3.2: Establish and support a framework for dissemination, storage and sharing of AMR research findings								
Activity: 3.3.2.1 Identify and utilize different approaches for dissemination of AMR research findings								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
3.3.2.1.1 Establish a National AMR bulletin/ outreach materials	MCC	Bulletin	5	Nationwide	2023-2028	Number of bulletin issues published		Gov/Partners
3.3.2.1.2 Establish and operationalize a virtual platform	MOH ,MLF, PORALG		5	Nationwide	2023-2028	number of platforms		Govt/Partners
3.3.2.1.3 Support synthesis and interpretation of AMR data	Research and academic institutions			Nationwide		Number of workshops conducted Number of documents with synthesized data.		Govt/Partners
3.3.2.1.4 Publish AMR research findings in reputable journals /books/ book chapters	MCC	Articles	300	Nationwide	2023-2028	Number of articles published		Gov/Partners

3.3.2.1.5 Support preparation and dissemination of AMR policy briefs	MCC	Workshops	10	Nationwide	2023-2028	Number of policy briefs developed Number of work-shops conducted		Gov/Partners
3.3.2.1.6 Disseminate AMR research through media and public gatherings	MCC	Sessions	150	Nationwide	2023-2028	Number of sessions		Gov/Partners
3.3.2.1.7 Conduct multi-sectoral One Health AMR scientific symposia and roundtable discussions annually	MCC	Symposium	5	Nationwide	2023-2028	Number of symposia conducted Number of roundtable discussions conducted		Gov/Partners
3.3.2.1.8 Support preparation and dissemination of AMR research evidence	MCC.	Materials	5	Nationwide	2023-2028	Number of materials prepared and disseminated		Gov/Partners
Activity: 3.3.2.2 Establish policy guidelines to address AMR data security and sharing in the country								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
3.3.2.2.1 Engage stakeholders to strategize on how they can include a policy statement during their sectoral research policy review	MCC	Workshop	1	Nationwide	2023-2028	A workshop being conducted		Gov/Partners
3.3.2.2.2 Formulate policy statement and its strategic objectives that will be adopted by all sectors to allow research data security and sharing across OH sectors	MCC	Workshop	1	Nationwide	2023-2028	A workshop being conducted		Gov/Partners

Activity: 3.3.2.3 Establish and sustain a national AMR data repository								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
3..3.2.3.1 Establish a centralized database on AMR	MoH/MLF/MoA		1	Nationwide	Jan-23	Database developed		Govt/Partners
3.3.2.3.2 Engage stakeholders to establish AMR database framework	MCC	Workshop	1	Nationwide	2023-2024	Number of workshops conducted, Number and types of stakeholders involved		Gov/Partners
3.3.2.3.3 Develop an electronic system for AMR data repository	MCC	Repository	1	Nationwide	2023-2024	Presence of a developed and piloted AMR data repository		Gov/Partners
3.3.2.3.4 Operationalize an electronic system for AMR data repository	MCC	Repository	1	Nationwide	2023-2028	Presence of a functional AMR data repository		Gov/Partners

STRATEGIC OBJECTIVE FOUR
REDUCE THE INCIDENCE OF INFECTIONS

Adequate water supply, sanitation, vaccines and better hygiene are key for infection prevention. This works to limit the development and spread of antimicrobial resistant infections as well as multi drug resistant pathogens. Pregnancy, abortion, and childbirth, especially where these events take place in healthcare settings without safe or hygienic conditions, put these individuals at a higher risk of exposure to AMR[7]. Drug resistance does not only occur in health care settings but also at the community level. There is also evidence of gender-based behaviors in handwashing that give men a two-fold increase in AMR infections compared with women[8]. And, men tend to self-prescribe and may not finish the full course of antimicrobials, leaving themselves at risk for AMR infections[9].

To facilitate infection prevention and control in health settings, the the NAP AMR 2017 - 2022 facilitated the establishment and strengthening of the national infection prevention and control program. Several key achievements were noted in the human sector, little was done for plants, animals and the environment sectors. Infection prevention and control measures including proper training of health personnel and education in the community is needed during the implementation of NAP-AMR 2023-2028.

Vaccination as part of IPC reduces the risk that antimicrobial resistant pathogens will develop and spread through food chain and other means including contact, vector bites, droplet etc. Several regulations were developed in animal sector and country vaccination programs, vaccine supply, capacity building and infrastructure was strengthened during the implementation of NAP AMR 2017-2022. Having strong vaccination program in the implementation of NAP AMR 2023-2028 will lead to reduced use of antimicrobials in animal and human which will lead to improved individual and country economy. Interventions for achieving minimum standards for maintaining a safe and clean environment and on farm biosecurity are also prioritized. To achieve this strategic objective, two priority actions have been identified: strengthen IPC and health waste management system.

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7 *World Health Organization. Tackling Antimicrobial Resistance (AMR) Together Working Paper 5.0: Enhancing the focus on gender and equity. 2018. Available at: https://cdn.who.int/media/docs/default-source/antimicrobial-resistance/amr-spc-npm/nap-working-papers/tackling-amr-together-working-paper-5-genderandequity-sept2018-en.pdf?sfvrsn=8b53f887_1&download=true. [cited 2022 June 15].*

8 *Soldin OP, Mattison DR. Sex differences in pharmacokinetics and pharmacodynamics. Clin Pharmacokinet. 2009;48(3):143–57. doi: http:// dx.doi .org/ 10 .2165/ 00003088 -200948030 -00001 PMID: 19385708*

9 *World Health Organization. Tackling Antimicrobial Resistance (AMR) Together Working Paper 5.0: Enhancing the focus on gender and equity. 2018. Available at: https://cdn.who.int/media/docs/default-source/antimicrobial-resistance/amr-spc-npm/nap-working-papers/tackling-amr-together-working-paper-5-genderandequity-sept2018-en.pdf?sfvrsn=8b53f887_1&download=true. [cited 2022 June 15].*

STRATEGIC OBJECTIVE 4

PRIORITY ACTION: INFECTION PREVENTION AND CONTROL

OBJECTIVE; STRENGHTEN INFECTION PREVENTION AND CONTROL PROGRAMS

Interventions	Activities
4.1.1: Promote of IPC programmes in all human health care settings	4.1.1.1: Conduct scheduled supportive supervision and monitoring to health facilities by quality assurance teams (Ministry level, RHMT, CHMT) 4.1.1.2: Conduct advocacy and sensitization on IPC 4.1.1.3: Facilitate availability of IPC related equipment, supplies, utilities (water supply) and guidelines
4.1.2: Strengthening vaccination programme in human	4.1.2.1: Strengthening vaccination and vector control programme in human
4.1.3: Establish and design IPC programmes in animal, aquatic, plant health services and Environmental Management	4.1.3.1: Design and introduce IPC interventions across animal health care setting
4.1.4: Strengthen vaccination Programme in animal health	4.1.4.1: Establish a robust vaccination for animal health
4.1.5: Strengthening community IPC, linkages and Partnership for IPC	4.1.5.1: Engage communities on implementation of personal hygiene and environmental sanitation Activity 4.1.5.2: Promote Food Chain Hygiene

PRIORITY ACTION : INFECTION PREVENTION AND CONTROL IN HEALTHCARE								
Objective 4.1: Strengthen infection prevention and control Programs								
Intervention 4.1.1: Promote of IPC programmes in all human health care settings								
Activity 4.1.1.1: Conduct scheduled supportive supervision and monitoring to health facilities by quality assurance teams (Ministry level, RHMT, CHMT)								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level (National/ Facility/ Community)**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
4.1.1.1.1 Conduct supportive Supervision to health facilities	MOH and PO-RALG	HCF	5000 HCF	National/Facility	2023-2028	Number of supervised facilities	906,784,508	Govt/Partners
4.1.1.1.2 Conduct IPC assessments on adherence of IPC standards by HCWs in all HFs and recognize best performing HFs	MOH and PO-RALG	HCF	5000 HCF	National/Facility	2023-2028	Number of facilities assessed	275,740,999	Govt/Partners
4.1.1.1.3 Conduct mentorship to health facilities	MOH and PO-RALG	HCF	5000 HCF	National/Facility	2023-2028	Number of facilities mentored	49,734,799	Govt/Partners
7.1.1.4 Train Healthcare Workers of all health facilities on IPC Monitoring and Evaluation	MoH	HCW	5000 HCF	National/Facility	2023-2028	Number of people trained	456,539,949	Govt/Partners
4.1.1.1.5 Conduct annual Data Quality assessment of IPC Monitoring and evaluation reports in health facilities	MoH	HCF	5000 HCF	National/Facility	2023-2028	Number of facilities evaluated and monitored	399,408,692	Govt/Partners
Activity 4.1.1.2: Conduct advocacy and sensitization on IPC								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level (National/ Facility/ Community)**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
4.1.1.2.2 Develop IPC Information, Education and communication (IEC) & behavioral change communication materials (BCC materials)	MoH, MLF, Ministry of agriculture and NEMC	Workshops	5	National	2023-2028	Number of IEC materials developed	728,784,842	Govt/Partners
4.1.1.2.3 Revise National IPC communication and behaviors change strategy for by June, 2025	MoH, MLF, MoA and NEMC	Workshops	3	National	2023-2028	National IPC communication and behaviors change strategy revised	239,653,124	Govt/Partners

4.1.1.2.4 Conduct sensitization and orientation sessions to stakeholders at all levels	MoH, MLF, MoA, and NEMC	Sensitization and orientation sessions	10	National	2023-2028	Sessions/Meetings reports	360,209,198	Govt/Partners
Activity 4.1.1.3: Facilitate availability of IPC related equipment, supplies, utilities (water supply) and guidelines								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level (National/ Facility/ Community)**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
4.1.1.3.1 Develop Training materials for Emerging/ reemerging diseases by June, 2025	MoH and MLF	workshops	10	National	2023-2028	workshops reports	268,154,548	Govt/Partners
4.1.1.3.2 Finalization of IPC M & E protocol by June, 2025	MoH and MLF	Workshops	2	National	2023-2025	Workshops reports	54,481,000	Govt/Partners
4.1.1.3.3 Finalization of Patient safety Guidelines.	MoH	Workshops	3	National	2023-2026	Workshops reports	77,400,000	Govt/Partners
4.1.1.3.4 Finalization of HAIs surveillance protocol by June 2025.	MoH	Workshops	5	National	2023-2026	Workshops reports	67,550,000	Govt/Partners
4.1.1.3.5 Finalization of standard operating procedures for HAIs prevention.	MoH	Workshops	3	National	2023-2026	Workshops reports	70,520,000	Govt/Partners
4.1.1.3.6 Printing of IPC Guidelines and material handouts by June 2025.	MoH	Copies	2000	National	2023-2025	IPC materials printed	555,500,000	Govt/Partners
4.1.1.3.7 Disseminate M&E, HAI protocol, IPC guidelines, SOPs, and standards to lower health facilities.	MoH	Dissemination sessions	5	National	2023-2028	Dissemination sessions reports	344,502,829	Govt/Partners
4.1.1.3.8 Support provision of adequate and appropriately maintained water, sanitation, and health care waste management facilities i.e., Improved toilets for clients& staff, hand washing facilities and incinerators)	MoH	HCF	4000 HCFs	Facility	2023-2028	Number of HCF maintained with water and sanitation facilities	1,015,050,000	Govt/Partners

Strategic Intervention 4.1.2: Strengthen vaccination Programme in human								
Activity 4.1.2.1: Strengthening vaccination and vector control programmes in human								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level (National/ Facility/ Community)**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
4.1.2.1.1 To review guidelines	MOH	Meetings	8	National	2023-2025	Dissemination sessions reports	98,100,000	Govt/Partners
4.1.2.1.2 To disseminate/ reviewed guidelines (vaccines and vaccination.	MOH	Meetings	92	National	2023-2025	Meeting reports	750,498,134	Govt/Partners
4.1.2.1.3 To conduct capacity building/Supervisory meetings with LGAs technical staff and other stakeholders in vaccination programmes	MOH	Meetings	92	National	2023-3028	Number meetings	835,034,521	Govt/Partners
Intervention 4.1.3: Establish and design IPC programmes in animal, aquatic, plant health services and Environmental Management								
Activity 4.1.3.1: Design and introduce IPC interventions across animal health care setting								
4.1.3.1.1 To develop National IPC guideline, standards and training materials for veterinary Facilities, Animal & Aquatic health practitioners and different types of farming systems	MLF and MoA	Workshops	20	National	2023-2025	Workshops reports	312,251,805	Govt/Partners
4.1.3.1.2 To develop IPC M & E protocol.	MLF and MoA	Workshops	3	National	2023-2025	Workshops reports	46,000,000	Govt/Partners
4.1.3.1.3 To develop National Residue Monitoring Plans for freshwater and Marine waters in wild and various types of farming systems at all levels.	MLF and MoA	Workshops	2	National	2023-2026	Workshops reports	199,152,810	Govt/Partners
4.1.3.1.4 To develop National IPC guidelines and SOP for plant, aquatic and animal health practitioners by June 2025.	MLF and MoA	Workshops	2	National	2023-2027	Workshops reports	270,828,747	Govt/Partners
4.1.3.1.5 To develop National communication strategy across plant, aquaculture and animal, health setting for IPC	MLF and MoA	Workshops	3	National	2023-2027	Workshops reports	197,182,000	Govt/Partners
4.1.3.1.6 To develop Surveillance protocol on pesticides with AMR effects	MLF and MoA	Workshops	3	National	2023-2027	Workshops reports	32,050,000	Govt/Partners

4.1.3.1.7 To disseminate developed national IPC guideline, standards and training materials for animal, plant & aquatic health farming systems	MLF and MoA	Dissemination sessions	50	National	2023-2028	Dissemination sessions reports	1,172,353,615	Govt/Partners
4.1.1.1.8 To disseminate developed IPC M & E protocol	MLF and MoA	Dissemination sessions	50	National	2023-2028	Dissemination sessions reports	178,164,000	Govt/Partners
4.1.3.1.9 To disseminate developed HAI Surveillance protocol on pesticides in relation to AMR	MLF and MoA	Dissemination sessions	50	National	2023-2028	Dissemination sessions reports	237,979,028	Govt/Partners
Intervention 4.1.4: Strengthen vaccination Programme in animal health								
Activity 4.1.4.1: Strengthening vaccination and vector control programmes for animal health								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level (National/ Facility/ Community)**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
4.1.4.1.1 To develop acaricide use guidelines	MLF	Meetings	8	National	2023-2025	Dissemination sessions reports	158,956,830	Govt/Partners
4.1.4.1.2 To disseminate/ reviewed regulations (vaccines and vaccination regulations (2020) and acaricide and acaricide application regulation (2020)	MLF	Meetings	92	National	2023-2025	Meeting reports	130,294,300	Govt/Partners
4.1.4.1.2 To conduct capacity building/Supervisory meetings with LGAs technical staff and other stakeholders in livestock industry	MLF	Meetings	92	National	2023-3028	Number meetings	191,581,103	Govt/Partners
Intervention 4.1.5: Strengthening community IPC, linkages and Partnership for IPC								
Activity 4.1.5.1: Engage communities on implementation of personal hygiene and environmental sanitation								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level (National/ Facility/ Community)**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
4.1.5.1.1 To develop community IPC guidelines and SOPs on implementation of personal Hygiene and environmental sanitation	MoH, MLF and NEMC	Workshops	10	National	2023-2025	Workshops reports	127,084,260	Govt/Partners

4.1.5.1.2 To conduct advocacy and campaigns on implementation of personal Hygiene and environmental sanitation	MoH, MLF, NEMC,	Meetings, conferences, tv/radio sessions	20	National	2023-2025	Number of meetings, campaigns, radio sessions	137,843,790	Govt/Partners
4.1.5.1.3 To disseminate community IPC guidelines and SOPs on implementation of personal Hygiene and environmental sanitation	MoH, MLF, NEMC,	Disseminations	50	National	2023-2028	Number of disseminations	153,030,150	Govt/Partners
Activity 4.1.5.2: Promote Food Chain Hygiene								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level (National/ Facility/ Community)**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
4.1.5.2.1 To develop general food chain hygiene guideline for IPC in relation to AMR in the community.	MoH, MoA, MLF, MIIT, Ministry of Natural Resources and Tourism, PO-RALG	Workshops	10	National and community	2023-2028	Guideline document	48,520,000	Govt/Partners
4.1.5.2.2 To disseminate of developed food chain hygiene IPC guideline with focus on food handling	MoH, MoA, MLF, MIIT, Ministry of Natural Resources and Tourism, PO-RALG	Meetings	100	National and community	2023-2028	Meeting reports	190,788,798	Govt/Partners
4.1.5.2.3 To conduct advocacy and awareness campaigns on food hygiene and IPC.	MoH, MoA, MLF, MIIT, Ministry of Natural Resources and Tourism, PO-RALG	Sessions/meetings/trainings	200	National and community	2023-2028	Advocacy and awareness campaigns reports	25,986,566	Govt/Partners


STRATEGIC OBJECTIVE 4
PRIORITY ACTION: HEALTH WASTE MANAGEMENT SYSTEM
OBJECTIVE; STRENGTHEN HEALTH WASTE MANAGEMENT AT ALL LEVELS
Interventions
Activities
4.2.1: Develop and strengthen system for health waste management in the public sector
4.2.1.1: Promote environmental sanitation and waste management
4.2.1.2: Promote Zoosanitary and phytosanitary environmental settings
4.2.1.3: Strengthen national and subnational monitoring system in the field of waste management
4.2.1.4: Promote management of emerging pollutants in terrestrial environment e.g., antimicrobial residues and others
4.2.1.5: Monitor disposal of antimicrobial in the environment
4.2.2: Establish evidence-based policies to guide management of antimicrobial residues in the environment
4.2.2.1: Conduct Systematic Review on antimicrobial residue in aquatic and terrestrial environment in all sectors to identify gaps

Operational Plan for Health Waste Management System

PRIORITY ACTION : HEALTH WASTE MANAGEMENT SYSTEM								
Objective 4.2: Strengthen health waste management at all levels								
Intervention 4.2.1: Strengthen Health Waste Management at all levels								
Activity 4.2.1.1: Promote environmental sanitation and waste management								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level (National/ Facility/ Community)**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
4.2.1.1.1 To review national IPC Standard Operating Procedures (SOPs) for Hazardous Wastes Control and Management.	MoH, VPO – NEMC	Document	1	National	2023-2025	SOPs document	239,653,124	Govt/Partners
4.2.1.1.2 To review of hazardous wastes control and management guideline (to incorporate IPC issues) by June 2023.	VPO – NEMC	Document	1	National	2023-2025	Reviewed document	199,152,810	Govt/Partners
4.2.1.1.3 To develop IPC training materials for Hazardous Waste Control & Management (HWCM) generated from human health, agriculture and livestock.	MoH, VPO – NEMC	Document	1	National	2023-2025	Training materials	156,600,000	Govt/Partners
4.2.1.1.4 Development of HCWMs surveillance protocol.	VPO – NEMC	Document	1	National	2023-2024	HCWMs surveillance protocol	49,005,200	Govt/Partners
4.2.1.1.5 To develop IPC Monitoring and Evaluation protocol/ Guidelines for Waste Management from various farm, factories, and health care settings.	MoH, VPO – NEMC, PORALG	Document	1	National	2023-2026	Developed IPC Monitoring and Evaluation protocol	104,595,600	Govt/Partners
4.2.1.1.6 To review and disseminate the Public Health Act 2009 to address proper waste management (antimicrobials) in relation to AMR	MoH	Document	30	National	2023-2024	Document	167,668,300	Govt/Partners

4.2.1.1.7 To conduct social behaviors, change and communication campaigns (SBCC) to promote improved toilets, handwashing facilities and menstrual health and hygiene (MHH)	MoH, PO-RALG	Media campaigns/ ground activations	500	national	2023-2024	Number improved toilets, handwashing facilities and menstrual health and hygiene (MHH)	399,408,692	Govt/Partners
4.2.1.1.8 To develop guidelines for public private partnership (PPP) on safe pit emptying, fecal sludge transportation and treatment to attain area wide open defecation free (ODF)	MoH, MoW, PO-RALG	Workshops/ Guidelines	300	National	2023-2024	Developed guideline	36,381,000	Govt/Partners
4.2.1.1.9 To disseminate developed guideline on public private partnership (PPP) on safe pit emptying, fecal sludge transportation and treatment to attain areawide open defecation free (ODF)	MoH, MoW, PO-RALG	Evaluation report	200	National	2023-2028	Number of dissemination meeting	158,166,000	Govt/Partners
4.2.1.1.10 To conduct Mid and End-term evaluation of the National Strategy for accelerating Sanitation and Hygiene for All (NSASHA) 2020-2025	MoH, MoW, PO-RALG	Report	Evaluation reports	2	2023-2028	Midterm evaluation report	36,562,000	Govt/Partners
Activity 4.2.1.2: Promote Zoosanitary and phytosanitary environmental settings								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level (National/ Facility/ Community)**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
4.2.1.2.1 To develop animal waste, effluent, and manure disposal guidelines	MLF	Workshops	3	National	2023-2025	Workshops reports	313,200,000	Govt/Partners
4.2.1.2.2 To develop guidelines, SOP, and training materials for fertilization of aquafarm systems particularly probiotics and seaweed fertilizer to curb down introduction of antimicrobial residue	MLF	Workshops	5	National	2023-2025	Workshops reports	158,166,000	Govt/Partners

4.2.1.2.3 To develop IPC guidelines for Zoo sanitary/ phytosanitary inspectors at ports of entries/exits (feeds, live animals, animal byproducts and agricultural products)	MLF	Workshops	5	National	2023-2025	Workshops reports	158,956,830	Govt/Partners
4.2.1.2.4 To print IPC guidelines for Zoosanitary/phytosanitary inspectors at ports of entries/exits	MLF	Copies	5000	National	2023-2028	Printed guidelines	90,000,000	Govt/Partners
4.2.1.2.5 To disseminate developed guidelines, SOP, and training materials for fertilization of aquafarm systems and Zoo sanitary/ phytosanitary inspectors at ports of entries/exits inspectors at ports of entries/exits	MLF	Dissemination sessions	10	National	2023-2028	Sessions/Meetings reports	317,913,660	Govt/Partners
Activity 4.2.1.3: Strengthen national and subnational monitoring system in the field of waste management								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**	**Implementation Level (National/ Facility/ Community)**	**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
4.2.1.3.1 To integrate health facility waste indicators into DHIS2/NSMIS	MOH and PO-RALG	Workshops	5	MOH and PO-RALG	2023-2027	Indicators in DHIS2	114,570,000	Govt/Partners
4.2.1.3.2 To disseminate waste monitoring tools	MoH and PORALG	Workshops	6	MOH and PO-RALG	2023-2028	Indicators in DHIS3/NSMIS	158,166,000	Govt/Partners
4.2.1.3.3 To establish waste registry at all districts in the country	MOH, PO-RALG and NEMC	workshops	5	National	2023-2026	Working registry	28,500,000	Govt/Partners
4.2.1.3.4 To develop community guidelines, SOPs and training materials for handling and disposal of remnants, unused and expired antimicrobials	MoA, MLF, MoH, NEMC and PO-RALG	Workshops	10	National and community	2023-2028	Policy document developed	158,956,830	Govt/Partners
4.2.1.3.5 To disseminate developed community guidelines, SOPs and training materials for handling and disposal of remnants, unused and expired antimicrobials	MoA, MLF, MoH, NEMC and PO-RALG	Sessions/ meetings	10	National	2023-2028	Sessions/Meetings reports	160,546,398	Govt/Partners
4.2.1.3.6 To provide adequate and appropriately maintained waste management equipment	MoH, NEMC, PO-RALG	HCF and wards		National, sub national and community	2023-2028	Supervision report	20,000,000	Govt/Partners

4.2.1.3.7 To conduct sensitization and orientation sessions to community on proper handling and disposal of remnants, unused and expired antimicrobials	MoA, MLF, MoH, NEMC and PO-RALG	sessions/ meetings/ trainings	100	National and community	2023-2028	Sessions/Meetings reports	399,408,692	Govt/Partners
Activity 4.2.1.4: Promote management of emerging pollutants in terrestrial environment e.g., antimicrobial residues and others								
Sub-Activity	Implementing Entity	Unit	Quantity	Implementation Level (National/ Facility/ Community)	Timeline	Output Indicator	Cost	Funding Source
4.2.1.4.1 To develop a system for collection of the emerging pollutants in the environment	VPO/NEMC	Workshops	2	Nationwide	September 2023	A system for collection of the emerging pollutants in the environment developed	78,300,000	Govt/Partners
4.2.1.4.2 To develop a tool for managing emerging pollutants in the environment	VPO/NEMC	Workshop	2	Nationwide	October 2023	A tool for managing emerging pollutants in the environment developed	36,381,000	Govt/Partners
4.2.1.4.3 To develop a tool to monitor the emerging pollutants in the environment	VPO/NEMC	workshops	2	Nationwide	December 2023	A tool for monitoring emerging pollutants in the environment developed	0	Govt/Partners

Activity 4.2.1.5: Monitor disposal of antimicrobial in the environment								
Sub-Activity	**Implementing Entity**	**Unit**	**Quantity**		**Timeline**	**Output Indicator**	**Cost**	**Funding Source**
4.2.1.5.1 To develop a system for collection of antimicrobials in the environment	VPO/NEMC/ MoH/MLF/MoA	Number	4	Nationwide	2024-2028	A system for collection of antimicrobials in the environment developed	41,100,000	Govt/Partners
4.2.1.5.2 To establish centers for collection of antimicrobial wastes at council level	VPO/NEMC/ MoH/MLF/MoA/ PORALG	Number	187	Sub-national	2024-2028	Centers for collection of antimicrobial wastes established	158,956,830	Govt/Partners
4..2.1.5.3 To conduct community education on antimicrobial waste disposal	VPO/NEMC/ MoH/MLF/MoA/ PORALG	Meetings	500	Sub-national	2024-2028	Community education on antimicrobial waste disposal conducted	12,060,000	Govt/Partners
Intervention 4.2.2: Establish evidence-based policies to guide management of antimicrobial residues in the environment								
Activity 4.2.2.1: Conduct Systematic Review on antimicrobial residue in aquatic and terrestrial environment in all sectors to identify gaps								
4.2.2.1.1 To conduct systematic reviews of published information on antimicrobial residue in aquatic environment	MoH, MLF, VPO-NEMC, PORALG and Education Institutions	Consultancy	1	Nationwide	2024-2028	Systematic reviews of published information on antimicrobial residue in aquatic environment conducted	27,100,000	Govt/Partners
4.2.2.1.2 To conduct systematic reviews of published information on antimicrobial residue in terrestrial environment	MoH, MLF, VPO-NEMC, PORALG and Education Institutions	Consultancy	1	Nationwide	2024-2028	Systematic reviews of published information on antimicrobial residue in terrestrial environment conducted	78,300,000	Govt/Partners

4.2.2.1.3 To conduct assessment of effluent from wastewater treatment systems	MoH, MLF, VPO-NEMC, PORALG and Education Institutions	Consultancy	1	Nationwide	2024-2028	Assessment of effluent from wastewater treatment systems conducted	358,127,368	Govt/Partners
4.2.2.1.4 To conduct stakeholders meeting	MoH, MLF, VPO-NEMC, PORALG and	Meetings	1	Nationwide	2024-2028	Meeting reports	0	Govt/Partners
4.2.2.1.5 To conduct validation meeting	MoH, MLF, VPO-NEMC, PORALG and Education Institutions	Meetings	1	Nationwide	2024-2028	Meeting reports	36,381,000	Govt/Partners
4.2.2.1.5 To prepare policy brief draft	MoH, MLF, VPO-NEMC, PORALG and Education Institutions	Technical meetings	5	Nationwide	2024-2028	Policy brief developed	36,200,000	Govt/Partners
4.2.2.1.6 To conduct dissemination meetings	MoH, MLF, VPO-NEMC, PORALG and Education Institutions	Meetings	20	Nationwide	2024-2028	Meeting reports	36,200,000	Govt/Partners

STRATEGIC OBJECTIVE FIVE
OPTIMIZE THE USE OF ANTIMICROBIAL AGENTS

By exerting selective pressure on microbial populations, antimicrobial use promotes the development of resistance traits and therefore the emergence and perpetuation of AMR. Antibiotics are amongst the most used antimicrobials, both in the human and agricultural sectors, and consumption levels have continued to increase both in high- and low-income countries. While current rates of use raise concerns, antimicrobials are an essential component of health care in all relevant sectors. The high burden of infectious diseases in LMICs, in particular, means that the need for antimicrobials remains high and therefore adequate access is also critical. Rational use of antimicrobial agents is critical in ensuring appropriate utilization of resources, preventing harmful effects related to overuse/misuse of antimicrobials, reducing risks of AMR development, ultimately increasing efficacy of antimicrobial agents.

During the implementation of the NAP-AMR (2017-2022), seven policies, laws and guidelines on the use of antimicrobial agents in humans, animals, agriculture and fisheries were developed and disseminated for utilization. However, there are no laws, regulations and guidelines on prescription and use of antimicrobials in aquatic animals and plants in place. Similarly, AMS implementation activities were largely executed at national levels (Tertiary and Regional Referral Hospitals; and at Zonal Veterinary Centres) with limited engagement at sub-national levels (Local Government Authorities).

During the NAP-AMR implementation, availability and utilization of STG/NEMLIT was consistently high (84%-91%) in human sector, however, the adequate labelling of prescriptions remained unacceptably low (less than 3%) underscoring need for continuous AMS capacity building. Also, the implementation and reinforcement of STG/NEMLIT in the private sector was not addressed in the previous NAP-AMR (2017-2022), this gap is therefore, emphasized in the NAP-AMR (2023-2028). Monitoring of antimicrobial use based on the WHO AWaRe categorization was evident in human sector and therefore, there is a need to develop a similar categorization scheme for veterinary antibiotics through a critical review and customization of the European Medicines Agency which classify veterinary antibiotics into ABCD (i.e., Avoid, Restrict, Caution and Prudence). Despite commendable performance in AMS core elements in five out of 10 hospitals (>70% score), there were two indicators which showed low performance specifically on the hospital formulary, and reporting feedback within the health care facility which need to be instituted in the NAP-AMR (2023-2028).

While there are 42 hospitals eligible to prepare hospital formulary, only 4 had operational hospital formulary, 20 hospitals had hospital formulary at various stages of editing, and 18 hospitals had not yet developed formularies. The revitalization of HMTC in all tertiary (national/zonal/special) and secondary (regional referral) hospitals was evident during the previous NAP-AMR implementation, however, there is a need to strengthen these programs at primary levels (district, health centres and dispensaries). Establishment and implementation of AMS programs in animal, plant and aquaculture sectors need to be addressed in NAP-AMR (2023-2028).

Lack of streamlined reporting system for regular inspection of pharmaceutical and agrovet outlets, and reporting system for supportive supervision in slaughter houses, abattoirs and slaughter slabs to ascertain compliance of withdraw periods and slaughter suitability was notable in the NAP-AMR (2017-2022) implementation. It is therefore, critical to streamline inter- and intra-sectoral coordination across regulatory authorities in controlling the use of antimicrobials in various outlets in NAP-AMR (2023-2028) implementation.

Furthermore, there is a need to conduct systematic surveys and streamlined reporting systems on antimicrobial use and antimicrobial consumption (in time, places and methods) to inform synchronized responsive interventions at national and sub-national levels. In addition, there is a critical need to incorporate monitoring of substandard, falsified and unregistered medical products in routine surveillance in the NAP-AMR (2023-2028). Therefore, in the proposed NAP-AMR (2023 – 2028), two priority actions, four interventions and 18 activities will be conducted.

Operational Plan for Regulatory Framework for Preservation of Antimicrobial agents

PRIORITY ACTION: REGULATORY FRAMEWORK FOR PRESERVATION OF ANTIMICROBIAL AGENTS								
Objective 5.1: Strengthen regulatory system in production, supply and prudent use of antimicrobial agents								
Intervention 5.1.1: Review Policies, Laws, Regulations and Develop Guidelines on prescriptions and use of antimicrobial agents in human, animals, plant, environmental health and aquatic animals								
Activity 5.1.1.1: Develop guidelines for handling and preservation of antimicrobial agents in animals, plant, environmental health and aquatic animals								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
5.1.1.1.1 Develop guidelines for handling, preservation and use of antimicrobial agents in plants	MoA	Workshop	3	Nationwide	Sep-23	Guidelines for handling and preservation of antimicrobial agents in plant developed	34,444,333	Govt/Partners
5.1.1.1.2 Develop guidelines for handling, preservation and use of antimicrobial agents in aquatic animals	MLF	Workshop	3	Nationwide	Oct-23	Guidelines for handling and preservation of antimicrobial agents in aquatic animals developed	64,434,920	Govt/Partners
5.1.1.1.3 Conduct stakeholders' validation meeting on the guidelines for use of antimicrobial agents in plants and aquatic animals	MOA/ MLF	Workshop	1	Nationwide	Nov-23	Conduct stakeholders' validation meeting on the guidelines for use of antimicrobial agents in plant and environment	88,646,690	Govt/Partners
5.1.1.1.4 Printing of the guidelines for use of antimicrobial agents in plants and aquatic animals	MOA/ MLF	Number of copies	500	Nationwide	Dec-23	Printing of the guidelines for use of antimicrobial agents in plant and environment	7,650,750	Govt/Partners
5.1.1.1.5 Dissemination of the guidelines for use of antimicrobial agents in plants and aquatic animals	MOA/ MLF	Workshop	4	Nationwide	Feb-24	Dissemination of the guidelines for use of antimicrobial agents in plant and environment	62,685,145	Govt/Partners

5.1.1.1.6 Develop guidelines on prescriptions and use of antimicrobial agents in animals	MOH/MLF	Workshop	3	Nationwide	Nov-23	Guidelines on prescriptions and use of antimicrobial agents in animals developed	71,158,861	Govt/Partners
5.1.1.1.7 Develop standard prescriptions for animal health	MLF/POLARG	Workshop	2	National wide	Aug-23	Standard prescription available	28,653,700	Govt/Partners
5.1.1.1.8 Stakeholders' validation meeting on the standardized prescriptions for animal health	MLF/POLARG	Workshop	1	National wide	Sep-23	Standard prescription available and in use	50,298,000	Govt/Partners
5.1.1.1.9 Print the standardized prescriptions for animal health	MoH/MLF/ PORALG	Prescriptions	250	Nationwide	Nov-23	Reports on use of prescriptions	5,100,500	Govt/Partners
5.1.1.1.10 Review laws related to distribution and retailing of antimicrobials in human and animal health/sectors	MOH/MLF/ PORALG	Workshop	3	Nationwide	Sep-23	Laws related to distribution and retailing of antimicrobials reviewed	97,435,205	Govt/Partners
5.1.1.1.11 Conduct stakeholders meeting on regulations of prescriptions and use of antimicrobials in human and animal health/sectors	MOH/MLF/ PORALG	Meetings	5	Nationwide	Jan-24	Number of meetings conducted	184,922,920	Govt/Partners
5.1.1.1.12 Review National Health Policy Guidelines to address/ incorporate AMS implementation activities	MOH/PORALG/ PMO-OH Section	Workshop	2	Nationwide	Jun-25	Number of workshops conducted	21,789,336	Govt/Partners
Activity 5.1.1.2: Develop operational guidelines for implementation of AMS at National, Sub-national level and Private sectors in human health								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
5.1.1.2.1 Prepare draft on operational guidelines for implementation of AMS at National, Sub-national level and Private sectors in human health	MOH	Workshop	2	Nationwide	Sep-23	Operational guidelines for implementation of AMS	15,675,200	Govt/Partners
5.1.1.2.2 Conduct stakeholders meeting to validate operational guidelines for implementation of AMS	MoH	Workshop	1	Nationwide	Nov-23	Meeting reports	44,743,000	Govt/Partners

5.1.1.2.3 Printing of the of AMS at National, Sub-national level and Private sectors in human health	MOH	No. of copies	800	Nationwide	Jan-24	Number copies	16,321,600	Govt/Partners
5.1.1.2.4 Dissemination of operational guidelines for implementation of AMS	MOH	Workshop	4	Nationwide	Mar-24	Number of workshops	29,423,254	Govt/Partners
Activity 5.1.1.3: Develop/review and disseminate STG and NEMLIT in veterinary practice, livestock production, plant health and fisheries; and include A to D categorization of antibiotics for use in animals								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
5.1.1.3.1 Review veterinary STG/ NEMLIT to include aquatic animals	MLF/PORALG	Workshop	4	Nationwide	Jan-24	STG/NEMLIT in veterinary practice, livestock production and aquaculture reviewed/developed	57,307,400	Govt/Partners
5.1.1.3.2 Review and incorporate A to D categorization of antibiotics for use in animals	MLF/PORALG	Workshop	2	Nationwide	Mar-24	STG/NEMLIT in veterinary practice, livestock production and aquaculture incorporate A to D categorization of antibiotics	28,653,700	Govt/Partners
5.1.1.3.3 Conduct stakeholders' validation meeting	MLF/PORALG	Meeting	1	Nationwide	Apr-24	Number of meetings held	50,298,000	Govt/Partners
5.1.1.3.4 Printing of the veterinary STG/NEMLIT	MLF/PORALG	Number of copies	500	Nationwide	Aug-24	Number of copies printed	10,100,000	Govt/Partners
5.1.1.3.5 Dissemination of veterinary STG/NEMLIT	MLF/PORALG	Workshop	1	Nationwide	Sep-24	Number of copies disseminated	50,298,000	Govt/Partners
Actiivity 5.1.1.4: Review and Disseminate National AWaRe List of antibiotics in human health								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
5.1.1.4.1 Conduct workshop to review hospital AMR surveillance data at Tertiary, RRH and selected District Hospitals (Diagnostic stewardship Program)	MoH	Workshop	2	Nationwide	Jan-24	National AWaRe List reviewed	30,209,100	Govt/Partners

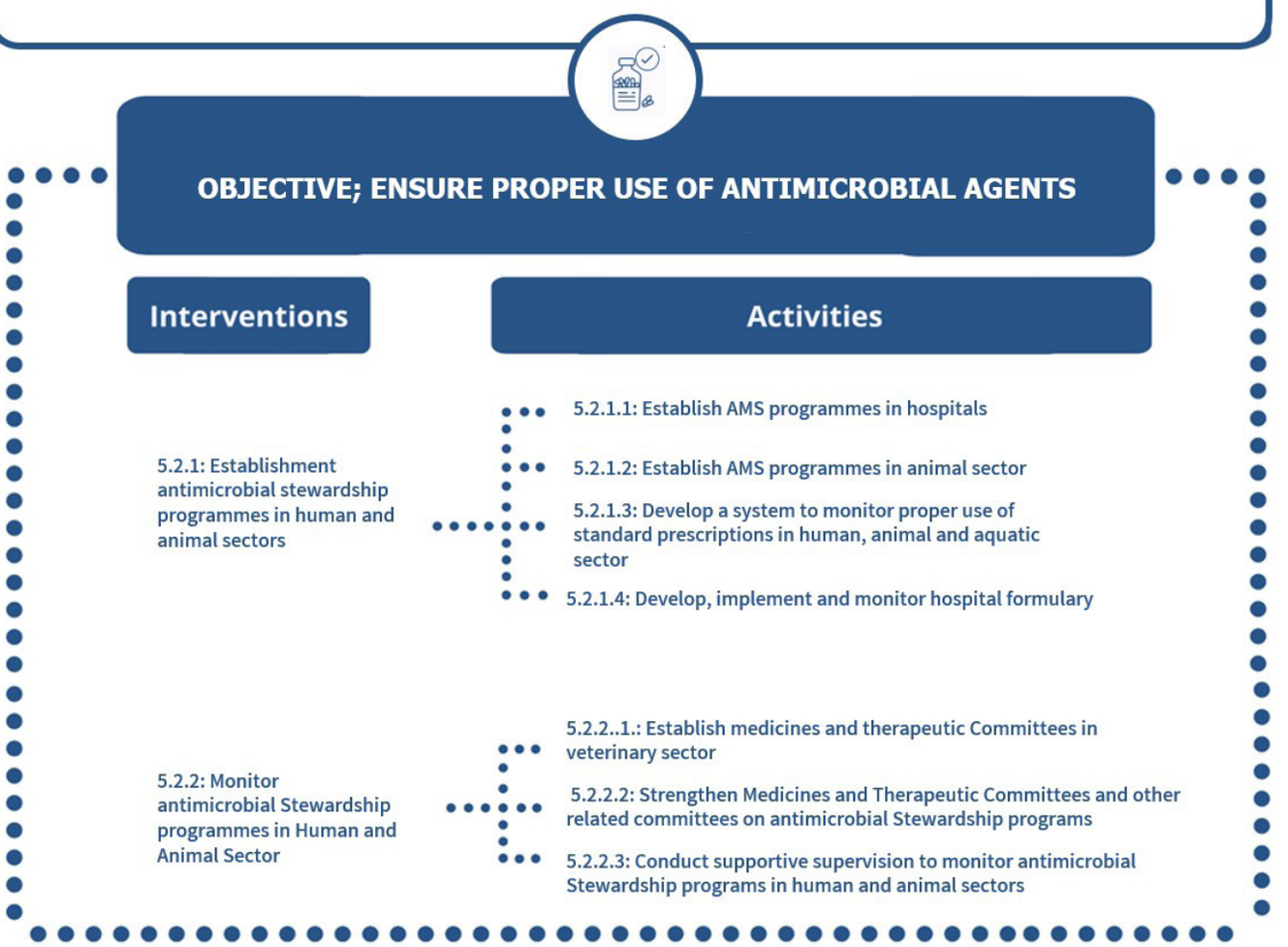
5.1.1.4.2 Conduct a review and validation meeting for the AWaRe List of antibiotics	MoH/PORALG	Meeting	3	Nationwide	Feb-25	Number of meetings	135,571,290	Govt/Partners
5.1.1.4.3 Conduct a review of ABCD categorization of antibiotics in animal health	MLF/PORALG	Meeting	3	Nationwide	Feb-25	Number of meetings	34,360,200	Govt/Partners
5.1.1.4.4 Develop national antibiogram for priority pathogens in human sector based on the hospital AMR surveillance data	MoH	Workshop	3	Nationwide	Jun-24	Number of workshops conducted	25,300,500	Govt/Partners
5.1.1.4.5 Validation of antibiogram for priority pathogens in human sector	MoH	Meeting	1	Nationwide	Aug-24	Number of meetings	30,439,784	Govt/Partners
5.1.1.4.6 Incorporate categorization of HAART into the existing guidelines	MoH/PORALG	Workshop	2	Nationwide	Mar-25	Number of workshops conducted	30,439,784	Govt/Partners
5.1.1.4.7 Incorporate categorization of antiprotozoal into the existing guidelines	MoH/MLF/PORALG	Workshop	2	Nationwide	Mar-25	Number of workshops conducted	30,439,784	Govt/Partners
5.1.1.4.8 Incorporate categorization of anti-TB into the existing guidelines	MoH/PORALG	Workshop	2	Nationwide	Mar-25	Number of workshops conducted	30,439,784	Govt/Partners
5.1.1.4.9 Incorporate categorization of antifungals into the existing guidelines	MoH/MLF/MoA/PORALG	Workshop	2	Nationwide	Mar-25	Number of workshops conducted	30,439,784	Govt/Partners
Activity 5.1.1.5: Review and disseminate STG/NEMLIT for human health, including AWaRe categorization of antimicrobials								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
5.1.1.5.1 Review the STG/NEMLIT for human health, including AWaRe categorization of antimicrobials	MoH	Workshop	7	Nationwide	Nov-23	STG/NEMLIT for human reviewed	75,507,600	Govt/Partners
5.1.1.5.2 Conduct stakeholders' validation meeting for the STG/NEMLIT	MoH	Meeting	3	Nationwide	Dec-03	Meeting reports	75,901,500	Govt/Partners
5.1.1.5.3 Printing of the revised STG/NEMLIT	MoH	Number of copies	5000	Nationwide	Mar-24	Number of copies printed	101,000,000	Govt/Partners

5.1.1.5.3 Dissemination and distribution of the revised STG/NEMLIT	MoH/ PORALG	Workshop	28	Nationwide	May-24	Workshop reports	102,317,040	Govt/Partners
Activity 5.1.1.6: Review and Disseminate Medicines and Therapeutic Committee Guidelines for Human health sector								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output indicator**	**Cost (Currency)**	**Source of Funding**
5.1.1.6.1 Prepare draft of the operational guidelines for MTC for human health/sector	MoH	Workshop	2	Nationwide	Apr-23	Medicines and Therapeutic Committee Operational Guidelines reviewed	27,098,300	Govt/Partners
5.1.1.6.2 Conduct stakeholders' validation meeting of the operational guidelines for MTC for human health/sector	MoH	Meeting	1	Nationwide	Jun-23	Meeting reports	39,188,000	Govt/Partners
5.1.1.6.3 Print the guidelines	MoH	Number of copies	500	Nationwide	Aug-23	Number of copies printed	10,100,000	Govt/Partners
5.1.1.6.4 Disseminate the operational guidelines for MTC for human health/sector	MoH/ PORALG	Workshop	29	Nationwide	September to December2023	Workshop reports	1,147,816,520	Govt/Partners
Intervention 5.1.2: Monitor proper use of antimicrobial agents								
Activity: 5.1.2.1 Conduct regular inspection on pharmaceutical and agro chemical outlets								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
5.1.2.1.1 Establish Joint-inspection teams with ToRs	MoH/ MLF/ MoA/ PORALG	Number of individuals	1	Nationwide	Jan-23	Joint-inspection teams established	0	Govt/Partners
5.1.2.1.2 Map Premises (Pharmacies, ADDO and Agrovet outlets) based on Risk approach	MoH/ MLF/ MoA/ PORALG	Field visits	28	Nationwide	Mar-23	Number of Premises mapped	223,943,000	Govt/Partners
5.1..2.1.3 Develop/Review checklist and SOPs for joint-inspection (Electronic checklist embedded with GIS Tech e.g., AfyaSS)	MoH/ MLF/ MoA/ PORALG	Workshop	1	Nationwide	May-23	Checklist and SOPs for joint-inspection developed/reviewed	13,549,150	Govt/Partners
5.1.2.1.4 Conduct stakeholders' validation meeting	MoH/ MLF/ MoA/ PORALG	Meeting	1	Nationwide	Jun-23	Meeting reports	33,633,000	Govt/Partners
5.1.2.1.5 Print developed checklist & SOPs	MoH/ MLF/ MoA/ PORALG	Number of copies	500	Nationwide	Aug-23	Number of copies printed	505,000	Govt/Partners

5.1.2.1.6 Orient inspectors, Health Management Team on the developed checklist & SOPs	MoH/ MLF/ MoA/ PORALG	Number of individuals	600	Nationwide	September to December 2023	Number of inspectors, Health Management Team oriented	266,943,000	Govt/Partners
5.1.2.1.7 Conduct Joint-inspection	MoH/ MLF/ MoA/ PORALG	Number of inspections	20	Nationwide	2024 to 2028	Number of Joint-inspections conducted	79,969,598	Govt/Partners
Activity 5.1.2..2: Establish a platform among the regulatory authorities to monitor proper use of antimicrobial agents in human, animals, aquatic, plant and environmental health								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
5.1.2.2.1 Establish Quarterly multisectoral regulatory authorities' meetings with ToRs (TMDA, PC, VCT, NEMC and Environmental Health Council)	MoH/ MLF/ MoA/ PORALG/VPO	Meetings	10	Nationwide	January 2023 to 2028	Multisectoral Regulatory Authorities Meetings conducted annually	11,025,000	Govt/Partners
Activity 5.1.2.3 Conduct mentorship in slaughter houses, abattoirs, slaughter slabs and aquatic farms to check compliance of withdraw periods and slaughter suitability								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
5.1.2.3.1 Develop mentorship package on compliance of withdraw periods and slaughter suitability (checklist/SOPs inclusive)	MLF/ PORALG	Workshop	1	Nationwide	Jan-23	Checklist/SOPs developed	11,025,000	Govt/Partners
5.1.2.3.2 Conduct orientation to mentorship team	MLF/ PORALG	Workshop (Regional)	26	Nationwide	Feb-23	Workshop report	73,200,000	Govt/Partners
5.1.2.3.3 Conduct workshop on slaughter protocols	MLF/ PORALG	Workshop (Regional)	26	Sub-national	2023-2028	Workshop reports	73,200,000	Govt/Partners
5.1.2.3.4 Conduct regular mentorship to ensure compliance with slaughter suitability and withdrawal periods	MLF/ PORALG	Visits	20	Sub-national	2023-2028	Visit reports	61,000,000	Govt/Partners
5.1.2.3.5 Conduct surveys to monitor withdrawal period in Eggs and Milk supply chains	MLF/ PORALG	Survey	20	Sub-national	2023-2028	Survey reports	39,000,000	Govt/Partners

STRATEGIC OBJECTIVE 5

PRIORITY ACTION: ANTIMICROBIAL STEWARDSHIP PROGRAMS



PRIORITY AREA: ANTIMICROBIAL STEWARDSHIP PROGRAM								
Objective 5.2: To ensure appropriate use of antimicrobial agents								
Intervention 5.2.1: Establishment antimicrobial stewardship programmes in animal sector; and strengthening of AMS programmes in human sectors								
Activity 5.2.1.1: Establish AMS programmes in hospitals								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
5.2.1.1.1 Map AMS stakeholders at national level	MoH/MLF/ PO-RALG/	AMS Maps	15	National level	Jan-24	Number of local and international organizations; tertiary and regional referral hospitals implementing AMS activities	13,600,000	Govt/Partners
5.2.1.1.2 Allocate AMS stakeholders to specific health facilities	MoH/MLF/ PO-RALG	AMS allocations	229	Sub-national level	Mar-24	Tertiary and RRHs linked to stakeholders	10,020,000	Govt/Partners
5.2.1.1.3 Establish Region AMS teams/ Committees under One-Health Approach	MOH/MLF/ PO-RALG	Number of Regions with AMS teams under One- Health Approach	28	Nationwide	2023-2028	Number of Regions with established AMS Teams/Committees under One- Health Approach	3,050,000	Govt/Partners
5.2.1.1.4 Establish Council AMS teams/ Committees under One-Health Approach	MOH/MLF/ PO-RALG	Number of AMS teams in OH Approach	187	Nationwide	2023-2028	Number of Councils with established AMS Teams/Committees under One- Health Approach	1,950,000,000	Govt/Partners
Activity 5.2.1.2: Establish AMS programmes in animal sector								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
5.2.1.2.1 Conduct need assessment on AMS program in veterinary sector	MLF/ PORALG	Workshop	2	Nationwide	Sep-23	AMS program need assessment in veterinary sector identified	20,400,000	Govt/Partners
5.2.1.2.2 Conduct stakeholders' meeting to review SWOC from needs assessment	MLF/ PORALG	Meeting	1	Nationwide	Oct-23	Meeting reports	9,925,000	Govt/Partners

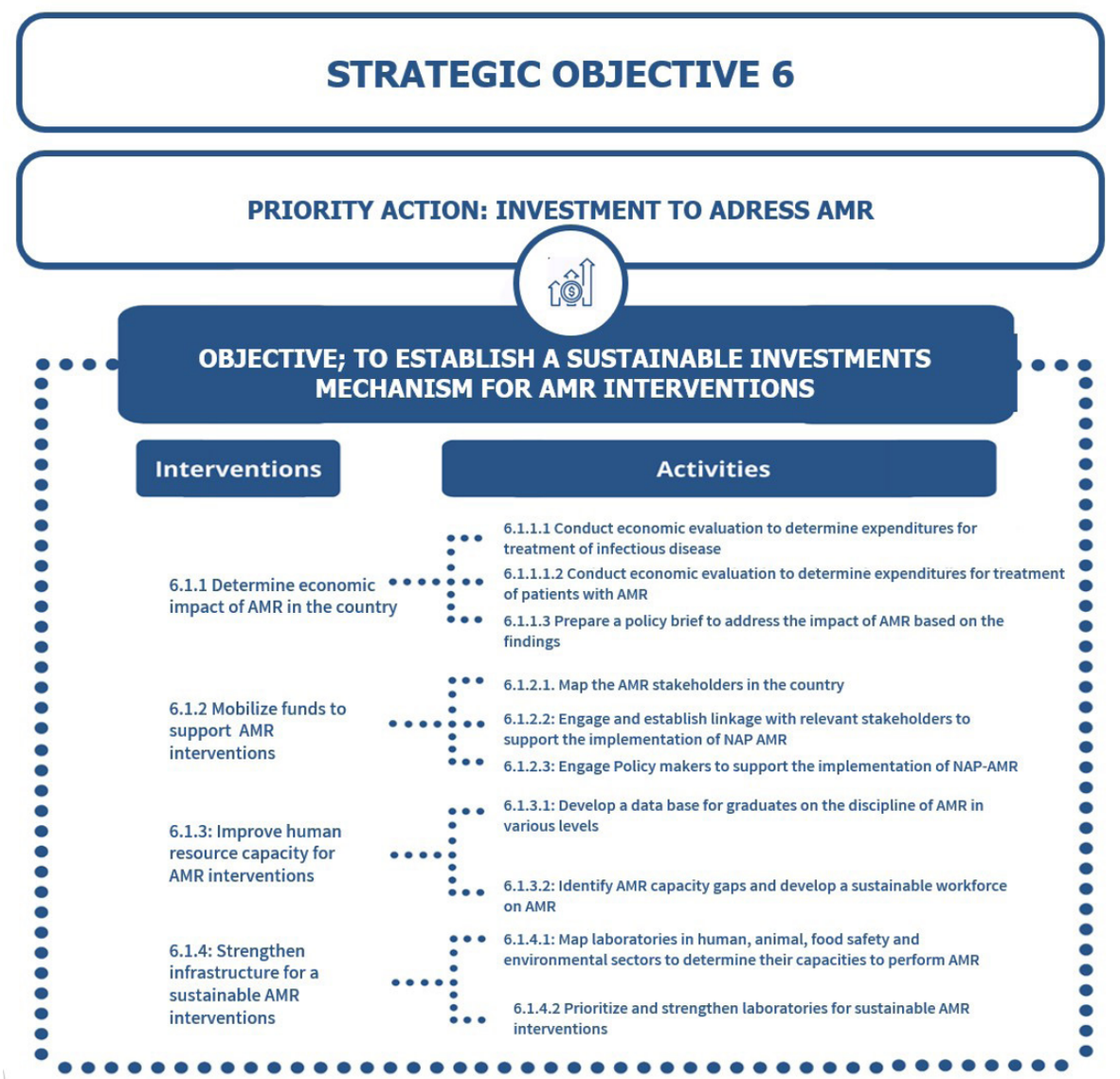
5.2.1.2.3 Establish AMS program in veterinary sector	MLF/ PORALG	Number of Established AMS program	187	Nationwide	2024 -2028	Number of councils with established AMS Programs	2,500,000	Govt/Partners
Activity 5.2.1.3: Develop a system to monitor proper use of standard prescriptions in human, animal and aquatic sector								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
5.2.1.3.1 To systematically assess the use of standardized prescription in human health in public and private health facilities	MoH/PORALG	Field surveys	26	Nationwide	Aug-23	Standard prescription in use	62,400,000	Govt/Partners
5.2.1.3.1 To systematically assess the use of standardized prescription in animal health	MoH/PORALG	Field surveys	26	Nationwide	Aug-23	Standard prescription in use	62,400,000	Govt/Partners
Activity 5.2.1.4: Develop, implement and monitor hospital formulary								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
5.2.1.4.1 To develop antibiogram based on Hospital AMR surveillance data	MoH/PORALG	Facilities	229	Nationwide	2023-2028	Facilities with developed antibiograms	69,200,000	Govt/Partners
5.2..1.4.2 To develop hospital formulary in tertiary and regional referral hospitals; which incorporate AWaRe categorization of antibiotics	MoH/PORALG	Facilities	229	Nationwide	2023-2028	Formulary developed	69,200,000	Govt/Partners
5.2.1.4.3 Pilot development of hospital formulary in a few selected district councils	MoH/PORALG	Facilities	10	Nationwide	2023-2028	Formulary developed	69,200,000	Govt/Partners
5.2.1.4.4 To develop antibiogram based on Hospital AMR surveillance data	MoH/PORALG	Facilities	229	Nationwide	2023-2028	Facilities with developed antibiograms	69,200,000	Govt/Partners

Intervention 5.2.2: Monitor antimicrobial Stewardship programmes in Human and Animal Sector								
Activity 5.2.2..1.: Establish medicines and therapeutic Committees in veterinary sector								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
5.2.2.1.1 Establish national veterinary committee to monitor treatment and antimicrobial use in veterinary sector	MLF	Committee	1	Nationwide	Apr-23	National veterinary therapeutic committee established	88,400,000	Govt/Partners
5.2.2.1.2 Develop guidelines for veterinary committee to monitor treatment and AMU in Veterinary sector	MLF/PORALG	Workshop	3	Nationwide	Dec-23	Veterinary therapeutic committee guidelines developed	10,300,000	Govt/Partners
Activity 5.2.2.2: Strengthen Medicines and Therapeutic Committees and other related committees on antimicrobial Stewardship programs								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
5.2.2.2.1 Conduct needs assessments at National, Regional and District levels	MoH/ PORALG	Assessment	1	Nationwide	2023-2028	Assessment reports	5,525,000	Govt/Partners
5.2.2.2.2 Develop comprehensive training packages	MoH/PORALG	Workshop	1	Nationwide	2023-2028	Training package developed	27,100,000	Govt/Partners
5.2.2.2.3 Conduct training of Trainers (TOTs) for HMTCs	MoH/PORALG	Workshop	1	Nationwide	2023-2028	Workshop reports	27,560,000	Govt/Partners
5.2.2.3.4 Conduct training to Medicines and Therapeutic Committees/other Committees on AMS programmes	MoH/PORALG	Workshop	26	Nationwide	2023-2028	Training reports	358,080,000	Govt/Partners
Activity 5.2.2.3: Conduct supportive supervision to monitor antimicrobial Stewardship programs in human and animal sectors								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
5.2.2.3.1 Develop/review supervision checklist and SOPs in human and animal sectors	MoH/MLF/MoA/ PORALG	Checklist	2	Nationwide	Jan-23	Checklist and SOPs developed	18,680,000	Govt/Partners
5.2.2.3.2 Conduct biannual supportive supervisions	MoH/MLF/MoA/ PORALG	Field Visits	260	Nationwide	2023-2028	Visits reports	124,800,000	Govt/Partners

STRATEGIC OBJECTIVE SIX
DEVELOP THE ECONOMY CASE FOR SUSTAINABLE INVESTMENT

AMR has a significant negative impact on the economy due to increased mortality, prolongation of illness and reduced labour efficiency. The World Bank considers funding antimicrobial resistance as an exceptional economic and health investment for countries. The world Bank report 2017, estimates that, if we do not address the problem of AMR, the world will lose 3.8 percent of its annual GDP by 2050, with an annual shortfall of $3.4 trillion by 2030[10]. Without AMR containment, the Sustainable development goals relating to poverty, childhood survival, and development are less likely to be achieved. Low-income countries will be affected more due to high burden of infectious diseases and poor health system.

Therefore, the return of economic and health investments in addressing antimicrobial resistance are needed to minimize the negative impact of antimicrobial resistance. Also, managing AMR requires a multidisciplinary collaborative and coordinated plan, including economic, scientific and political actors.



[10] *World Bank Report (March, 2017): Drug Resistance Infections: A Threat to our Economic Future. https://documents1.worldbank.org/curated/en/323311493396993758/pdf/final-report.pdf*

Operational Plan for Investments to Address Antimicrobial Resistance

PRIORITY ACTION: INVESTMENTS TO ADDRESS ANTIMICROBIAL RESISTANCE								
Objective 6.1: To establish a sustainable investments mechanism for antimicrobial resistance interventions								
Intervention 6.1.1 Determine economic impact of AMR in the country								
Activity 6.1.1.1 Conduct economic evaluation to determine expenditures for treatment of infectious disease								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
6.1.1.1.1 Develop a protocol	MoH/MLF/MoA	Workshop	1	National	2024	Protocol in place	17,170,000	Govt/Partners
6.1.1.1.2 Collect data	MoH/MLF/MoA	Field work	1	Nationwide	2024	Field work report	36,602,400	Govt/Partners
6.1.1.1.3 Perform data analysis and report writing	MoH/MLF/MoA	Workshop	1	National	2024	Evaluation report	10,706,000	Govt/Partners
Activity : 6.1.1.1.2 Conduct economic evaluation to determine expenditures for treatment of patients with AMR								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
6.1.1.2.1 Develop a protocol	MoH/MLF/MoA	Workshop	1	National	2024	Protocol in place	0	Govt/Partners
6.1.1.2.2 Collect data	MoH/MLF/MoA	Field work	1	Nationwide	2024	Field work report	36,602,400	Govt/Partners
6.1.1.2.3 Perform data analysis and report writing	MoH/MLF/MoA	Workshop	1	National	2024	Evaluation report	9,090,000	Govt/Partners
Activity : 6.1.1.3 Prepare a policy brief to address the impact of AMR based on the findings								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
6.1.1.3.1 Conduct a workshop to develop a policy brief	MoH/MLF/MoA	Workshop	4	Nationwide	Jan-24	Policy brief	18,698,443	Govt/Partners
6.1.1.3.2 Disseminate a Policy brief to policy makers and other key stakeholders	MoH/MLF/MoA	Workshop	2	Nationwide	Mar-24	Dissemination report	73,243,180	Govt/Partners

Intervention: 6.1.2 Mobilize funds to support AMR interventions								
Activity 6.1.2.1. Map the AMR stakeholders in the country								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
6.1.2.1.1 Identify all AMR stakeholders in the country	MCC Secretariat	1	5	Nationwide	2023-2028	National AWaRe List reviewed	33,300,000	Govt/Partners
6.1.2.1.2 Develop a data base for AMR stakeholders	MCC Secretariat	1	5	Nationwide	2023-2028	Number of meetings	269,333,065	Govt/Partners
Activity 6.1.2.2: Engage and establish linkage with relevant stakeholders to support the implementation of NAP AMR								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
6.1.2.2.1 Engage stakeholders to document their areas of NAP-AMR implementation and their supports	MCC Secretariat	Workshop	1	Nationwide	2023-2028	Number of meetings	146,493,612	Govt/Partners
6.1.2.2.2 Conduct annual meeting to share information on the implementation of NAP-AMR	MCC Secretariat	Workshop	1	Nationwide	2023-2028	Number of meetings	220,363,416	Govt/Partners
Activity 6.1.2.3: Engage Policy makers to support the implementation of NAP-AMR								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
6.1.2.3.1 Sensitize Member of Parliament to support AMR intervention	MoH/MLF/MoA	Workshop	5	National	2023-2028	Sensitization report	400,000	Gov/Partners
6.1.2.3.2 Sensitize Policy Makers at National, Regional and Council levels to support AMR interventions	MoH/MLF/MoA/PO-RALG	Workshop	5	Nationwide	2023-2028	Sensitization report	500,000	Gv/Partners
Intervention 6.1.3: Improve human resource capacity for AMR interventions								
Activity 6.1.3.1: Develop a data base for graduates on the discipline of AMR in various levels								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
6.1.3.1.1 Identify all AMR graduates from fellowship of other program	MCC Secretariat	1	5	Nationwide	2023-2028	Availability of Database	0	No fund needed
6.1.3.1.2 Document all in a data base and update the list	MCC Secretariat	1	5	Nationwide	2023-2028	An updated database	0	No fund needed

6.1.3.1.3 Design a system to use the qualified experts in the field in the implementation of NAP AMR	MCC Secretariat	1	5	Nationwide	2023-2028	An updated data-base	18,356,750	No fund needed
Activity 6.1.3.2: Identify AMR capacity gaps and develop a sustainable workforce on AMR								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
6.1.3.2.1 Conduct a workshop to identify gaps for a workforce in the implementation of NAP-AMR	MoH/MLF/MoA/PO-RALG	Workshop	1	National wide	2023-2028	Workshop report	67,000,000	Gov/Partners
6.1.3.2.2 Look for opportunities to build their capacity in certificate, masters and PHD levels	MoH/MLF/MoA/PO-RALG	1	5	National wide	2023-2028		0	Gov/Partners
Intervention 6.1.4: Strengthen infrastructure for a sustainable AMR interventions								
Activity 6.1.4.1: Map laboratories in human, animal, food safety and environmental sectors to determine their capacities to perform AMR								
6.1.4.1.1 Develop an assessment checklist based on international standards	MoH/MLF/VPO/TBS/ PORALLG	Field work	1	National wide	2024	Assessment report	19,779,750	Gov/Partners
6.1.4.1.2 Assess laboratories capacity in performing AMR	MoH/MLF/VPO/TBS/ PORALLG	Field work	1	National wide	2024	Assessment report	188,344,800	Gov/Partners
6.1.4.1.3 Develop and review a data base indicating their capacities	MCC Secretariat	Data base	1	National	2024-2028	Data base	12,928,000	No fund needed
Activity 6.1.4.2 Prioritize and strengthen laboratories for sustainable AMR interventions								
Sub-activity	**Implementing entity**	**Unit**	**Quantity**	**Implementation level (national/facility/ community)**	**Time line**	**Output Indicator**	**Cost (Currency)**	**Source of Funding**
6.1.4.2.1 Conduct a workshop to prioritize laboratories to be strengthens	MoH/MLF/VPO/TBS/ PORALLG	1	4	National wide	2024-2028	Workshop report	33,269,400	Gov/Partners
6.1.4.2.2 Secure funds to renovate prioritized laboratories	MoH/MLF/VPO/TBS/ PORALLG	1	4	National wide	2024-2028	Financial reports	0	Gov/Partners
6.1.4.2.3 Renovate prioritized laboratories	MoH/MLF/VPO/TBS/ PORALLG	1	4	National wide	2024-2028	List of renovated laboratories	5,100,500,000	Gov/Partners

MONITOR AND EVALUATE THE NAP AMR

The Monitoring and Evaluation (M&E) plan offers a framework for evaluating the National Action Plan for AMR's progress. The purpose of monitoring and evaluation is to establish a strategic connection with the appropriate stakeholders in order to guarantee that strategies are successful in addressing the threats posed by antimicrobial resistance in Tanzania. The M&E framework includes, activities/ process indicators, output indicators as well as a results assessment for outcomes and goals.

The monitoring and evaluation plan is thus expected to provide an initial foundation to all stakeholders regarding pertinent and relevant indicators that can alert to successes and failures in the implementation of the NAP-AMR. It is therefore assumed that the implementation of antimicrobial resistance prevention and containment interventions be monitored and evaluated in order to gain a better understanding of the scope of the problem throughout the country and to measure any progress at the output, outcome, and impact levels. Such monitoring and requires the collection, collation, analysis and management of data from the human, animal, plant and environment sectors. Monitoring and evaluation help to extract relevant information from ongoing activities that can be used for program fine-tuning, reorientation and future planning.

Indicators are developed by considering results framework from output, outcome and impact levels. Indicators at impact level were entirely adopted from WHO's pre-determined Global Action Plan for AMR indicators. At outcome level, some of the indicators were adopted from the same framework however some more others were developed by conceptualization of output indicators achievement for an accrued period of time. On the other hand, output indicators were developed directly from planned interventions at activity level.

The monitoring and evaluation framework of this National Action Plan for AMR will include: Standard reporting systems (reporting template, line of communication, frequency of reporting), routine and periodic monitoring mechanisms, such as supportive supervision and regular review meetings and midline and end line evaluation to assess achievement of envisioned outcomes and consequently impacts.

The monitoring and evaluation TWG shall be established and regularly review the M&E framework for monitoring progress. The technical working group shall have an independent task of collection, aggregation, analysis and reporting of NAP data generated by AMR TWGs, civil society members, patient group representatives, non-governmental organizations and other AMR partner projects and evaluate the extent to which this is making an impact at the national and subnational levels. Also, the Tripartite AMR country self-assessment survey (TrACSS) indicators are integrated in the M & E framework.

The monitoring and evaluation matrix summary (appendix X) adheres to the typical programmatic M&E structure, which includes the basic resources needed, the process or activities, the outputs, outcomes and their desired impact over the long term. Also, the key performance indicators are attached as appendix XI.

COSTED NAP-AMR OPERATIONAL PLAN

The costing of the NAP-AMR was performed using the WHO tool for NAP-AMR. The costed document, comprises of 34 strategic interventions, and 85 activities. The total cost is Tanzania shillings 61,541,380,950. Activities were costed across six strategic areas:

1. Governance (TZS. 2,369,702,017/=)
2. Awareness and Education (TZS 4,580,344,679/=)
3. AMR/AMC/AMU Surveillance and Research (TZS 27,953,082,645/=)
4. Infection Prevention and Control (15,878,376,279/=)
5. Optimizie use of antimicrobials (TZS 4,814,203,124)
6. Sustainable investment (TZS 6,245,672,206/=)

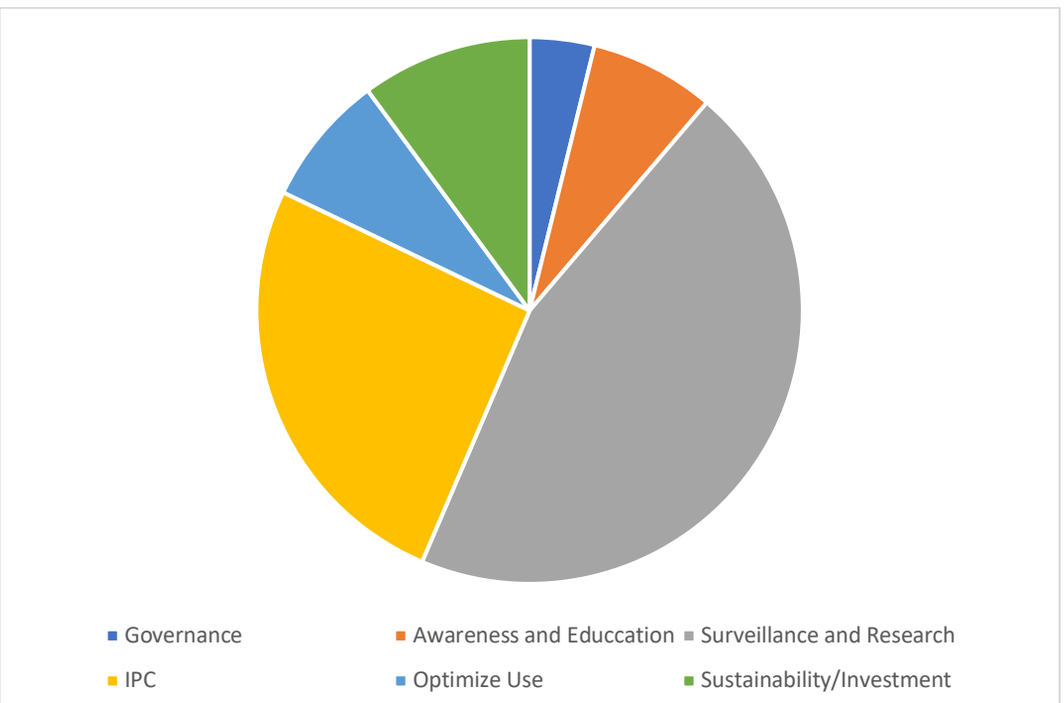


Figure 12: Distribution of costs across six key areas

The costs for implementing activities are distributed across lead ministries and other implmenters including the ministry responsible for health, livestock and fisheries, agriculture and environments. The costed activities are attached as appendix XII and the costs of sub activities are included in the operational plan matrix.

APPENDIX I: LIST OF CONTRIBUTORS

Members of the National Multisectoral Coordinating Committee are mandated to oversee the development and implementation of the National Action Plan on Antimicrobial Resistance. Their names are listed for reference.

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35	Mr. Ahmed Enock Amasha	Sokoine University of Agriculture
36	Dr. Mbarouk Seif	National Tuberculosis and Leprosy Program
37	Ms. Mary Mtui	Laboratory Council (MoH)
38	Mr. Michael Mosha	Rollback Antimicrobial Resisistance Initiatives
39	Dr. Happiness Kumburu	Kilimanjaro Christian Research Institute
40	Mr. Frank Magwaza	Ministry of Agriculture
41	Ms. Patricia Mbago	CHAI
42	Mr. Jonas Gervas	ARU
43	Ms. Faith P. Masia	Sokoine University of Agriculture
44	Dr. Geofrey Omaroa	Tanzania Veterinary Laboratory Agency, Dar es Salaam
45	Mr. Benedict Lugwishi	HIASO
46	Dr. Michael J. Msolla	LITA
47	Pharm. Paul Josephat Njige	Tanzania Pharmaceutical Association
48	Pharm. Adam Mohamed	Tanzania Pharmaceutical Association
49	Dr. Fares J. Biginagwa	Sokoine University of Agriculture
50	Mr. Ambele Mwafulongo	National Public Health Laboratory

Prioritized activities were costed in the World Health Organization costing tool by Dr. Abubakar Hoza (SUA), Mr. Emmanuel Magembe (NPHL), Mr. Akili Mawazo (MUHAS) and Pharm. Siana G. Mapunjo (MCC Secretariat). The technical support for costing and analysis was provided by WHO Consultants (WHO-Geneva). Editing of the NAP-AMR (2023-2028) was accomplished by Prof. Jeremiah Seni (CUHAS), Prof. Robinson Mdegela (SUA), Pharm. Rose Shija (WHO) and Dr. Ndekya Oriyo (NIMR).

APPENDIX II: TERMS OF REFERENCE FOR THE NATIONAL AMR MULTI-SECTORAL COORDINATING COMMITTEE (MCC)

Purpose

The purpose of the national Multi-sectoral Coordinating Committee (MCC) is to oversee and, coordinate AMR-related activities in all sectors including oversight and input into the development and implementation of the National AMR Plan of action.

Scope

The MCC shall address all AMR-related activities in the country.

Role and responsibilities

Leadership

The MCC shall lead facilitation and coordination of a national response to the threat of AMR from a One Health Approach.

Information sharing

The MCC shall provide a structure for information-sharing to mutually reinforce activities among sectors.

Facilitation and coordination

The MCC shall facilitate and coordinate efforts to contain and reduce the threat of AMR at national and subnational levels. The MCC will build a collaborative, cooperative, supportive environment for sharing knowledge, information and experience. Each participating party should understand the scope and limits of its own contributions and also its inter-dependence with other parties and with the whole system in order to meet the defined goals.

External interactions

Collaboration with external partners, agencies and organizations is essential for the implementation of NAP-AMR. The MCC will map, guide, encourage and work with all stakeholders implementing NAP-AMR 2023-2028.

Internal interactions

The MCC will interact and have clearly defined roles and responsibilities in existing health system, human health and disease-specific programmes, animal health, agriculture, the food sector and environmental initiatives.

Membership

The national MCC shall be composed of members representing the relevant sectors, notably human health, animal health, agriculture, food safety and environment sectors. Membership of the national MCC will consist of:

1. Chief Medical Officer ***(Chairperson)***
2. Director, Veterinary Services ***(Co- Chair)***
3. Chief Pharmacist ***(Member)***
4. MCC Secretariat ***(Six focal persons representing the responsible ministries/institutions)***
5. Representative World Health Organization ***(Member)***
6. Representative Food and Agriculture Organization ***(Member)***
7. Representative World Organisation for Animal Health ***(Member)***
8. Representative United Nation Environmental Programme ***(Member)***

9. Representative Centre for Disease Control ***(Member)***
10. Representative Ministry of Livestock and Fisheries- Fisheries ***(Member)***
11. Representative Ministry of Agriculture ***(Member)***
12. Representative Vice President's office ***(Member)***
13. Representative from PORALG ***(Member)***
14. Representative TBS ***(Member)***
15. Representative Tanzania Medicines and Medical Devices Authority ***(Member)***
16. Representative National Medical Research Institution ***(Member)***
17. Representative Livestock Research Institution ***(Member)***
18. Representative Agriculture University ***(Member)***
19. Representative Medical University ***(Member)***
20. Representative National Public Health Laboratory ***(Member)***
21. Representative Tanzania Veterinary Laboratory Agency ***(Member)***
22. Representative Health Quality Inspectorate Unit (MOH) ***(Member)***

Schedule of the Meeting

The regular meetings will be conducted on a quarterly basis or whenever the need arises and will be held as per government norms. MCC members will be required to attend the meeting in person. Minutes of the meetings should be recorded and filed by the Secretariat.

Tenure of Office

Tenure of office for nominated members shall be three years but renewable for some members.

APPENDIX III: TERMS OF REFERENCE FOR THE NATIONAL AMR MULTI-SECTORAL COORDINATING COMMITTEE – SECRETARIAT

Purpose

To coordinate the implementation of all AMR activities including the logistics for MCC meetings.

Scope, roles and responsibilities

The scope, roles and responsibilities of the focal point should:

1. Prepare and coordinate MCC meetings (e.g. background papers, reports and advisory notes to MCC);
2. Storage and archiving of MCC work;
3. Build sustained partnerships and work nationally and internationally on containment of AMR;
4. Lead and coordinate drafting of a national action plan and accompanying strategies for containment of AMR;
5. Facilitate and oversee implementation the NAP-AMR;
6. Ensure regular monitoring and evaluation of progress through data collection and information sharing by instituting effective communication, collaboroation and coordination among all stakeholders, the members of MCC and their constituencies, sectors and disciplines;
7. Coordinate national activities for establishment of AMR surveillance systems;
8. Report on the prevalence of and trends in AMR and AMC/AMU to GLASS and WOAH.

Secretariat Members

The Secretariat shall consist of members from responsible ministries/institutions including the Ministry of Health and Ministry of Livestock and Fisheries. It will comprise of at least six technical officers with at least five years of outstanding experience in AMR interventions. The Secretariat will be approved by the MCC.

APPENDIX IV: TERMS OF REFERENCE AMR FOCAL POINTS FOR RELEVANT SECTORS

Purpose

AMR focal points should be designated to coordinate AMR activities and tasks in the relevant sectors.

Scope, roles and responsibilities

The focal point should:

1. Build sustained partnerships and work nationally and internationally on containment of AMR;
2. Identify stakeholders for NAP-AMR implementations;
3. Support the functionality of the MCC and AMR TWGs;
4. Lead and coordinate the review and implementation of the NAP-AMR in the responsible sector;
5. Ensure regular data collection and information sharing by instituting effective communication and coordination among all stakeholders, and their constituencies, sectors and disciplines;

Note

In view of the complexity of AMR, which requires a collaborative response, and in view of the importance of a comprehensive approach to addressing AMR at country level, the focal points should have good communication skills, convening power, resources and strong managerial skills. The focal point will be the primary contact for all issues related to AMR in the country (for the specific sectors).

APPENDIX V: TERMS OF REFERENCE FOR AMR AWARENESS AND EDUCATION TECHNICAL WORKING GROUP

Purpose

Improve awareness and understanding of AMR through effective communication, education and training

Scope

Provide technical support during the development and implementation of the AMR national action plan

Roles and Responsibilities

The AMR Awareness and Education TWG is a national group that will advise the MCC on issues of awareness creation and education on AMR to all stakeholders through the One Health Approach. The TWG is also responsible for technical guidance on implementation of the NAP with regards to the following areas:

1. National awareness of antimicrobial resistance through public communication programmes that target the different audiences in human health, animal health and agricultural practice, including participation in national antibiotic awareness campaigns.
2. Establishment of antimicrobial resistance as a core component of professional education, training, certification and development for the health and veterinary sectors and agricultural practice.
3. Inclusion of antimicrobial use and resistance in school curricula in order to promote better understanding and awareness, and provide the public media with accurate and relevant information so that public information and reporting reinforce key messages
4. Recognition of antimicrobial resistance as a priority need for action across all government ministries through inclusion in national risk registers or other effective mechanisms for cross-government commitment
5. Promotion and support establishment of multi-sectoral (one-health) coalitions to address antimicrobial resistance at local and national levels.
6. Facilitate in conducting operational research on the area of AMR awareness and education for the informed decision making.

Membership

The TWG will consist of the following members

SN	ORGANIZATION	RESPONSIBILITY
1	Among the MCC members	Chairperson
2	Representative from TMDA	Member
3	Representative from Pharmaceutical Services Unit (MoH)	Member
4	Representative MLF (Livestock)	Member
5	Representative MLF (Fisheries)	Member
6	Representative MoA	Member
7	Representative Ministry of Education	Member
8	Representative PORALG	Member
9	Representative environmental sector	Member
10	Representative training Institution (Public)	Member
11	Representative training institution (Animal)	Member
12	Representative Research Institution	Secretariat
13	Representative MoH- Health promotion	Member
14	Representatives Local NGOs	Member
15	Representative students associations	Member
16	Any other co-opted members	Member

Schedule of Meeting

The regular meeting will be conducted on quarterly basis or whenever the need arises and will be held as per government norms. Minutes of the meetings should be recorded and shared with the National Multi-sectoral AMR Coordinating Committee.

APPENDIXES VI: TERMS OF REFERENCE FOR AMR SURVEILLANCE TECHNICAL WORKING GROUP

Purpose

Strengthen the knowledge and evidence base through surveillance and research

Scope

Provide technical support during the development and implementation of the AMR national action plan

Roles and Responsibilities

The AMR Surveillance and Research TWG is a national group that will advise the MCC on issues of AMR Surveillance and Research to all stakeholders through the One Health Approach. The TWG is also responsible for technical guidance on the implementation of the NAP regarding the following areas:

1. Strengthening the National surveillance system for antimicrobial resistance
2. Collection, storage, and analysis of data on antimicrobial resistance in human health, animal health, food safety, aquaculture, agriculture, and environment
3. Strengthening surveillance of antimicrobial residual in foods of animal and plant origin and environment.
4. Collection, storage, and analysis of data on antimicrobial residual surveillance in food of animal and plant origin and environment
5. Reporting antimicrobial resistance data to GLASS and other international platforms
6. Building Laboratory capacity and support of AMR surveillance activities in human, animal agriculture, aquaculture, food safety and the environment
7. Implementation of public health research agenda on antimicrobial resistance
8. Collection, storage, dissemination and sharing of AMR research findings
9. Supporting national biobank for storage of AMR priority pathogens

Membership

The TWG will consist of the following members

SN	ORGANIZATION/INSTITUTION	RESPONSIBILITY
1	Among MCC Members	Chairperson
2	Representative National Public Health Laboratory	Member
3	Representative Central Veterinary Laboratory	Member
4	Representative TBS (Food safety)	Member
5	Representative NEMC	Member
6	Representative MLF (Livestock)	Member
7	Representative MoH (Diagnostics)	Member

8	Representative MLF (National Fisheries Quality Control Laboratory)	Member
9	Representative PORALG	Member
10	Representative MOH (Epidemiology)	Member
11	Representative Tanzania Plant Health and Pesticide Authority (TPHPA)	Member
12	Representative academic institution (Health)	Member
13	Representative academic institution (animal)	Member
14	Representative from research institution	Member
15	Any other Co opted members	Member

Schedule of Meeting

The regular meeting will be conducted on quarterly basis or whenever the need arises and will be held as per government norms. Minutes of the meetings should be recorded and shared with the National Multi-sectoral AMR Coordinating Committee.

APPENDIX VII: TERMS OF REFERENCE FOR HYGIENE, INFECTION PREVENTION AND CONTROL - TECHNICAL WORKING GROUP

Purpose

Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures

Scope

Provide technical support during the development and implementation of the AMR national action plan

Roles and Responsibilities

The Hygiene, Infection Prevention and Control TWG is a national group that will advise the MCC on issues of Hygiene, Infection Prevention and Control on AMR to all stakeholders through the One Health Approach. The TWG is also responsible for technical guidance on implementation of the NAP with regards to the following areas:

1. Plan, implement and strengthen hygiene and infection prevention and control;
2. Develop and strengthen national policies and standards of practice regarding infection prevention and control in health facilities;
3. Strengthen animal health and agricultural practices through implementation of the standards published in the WOAH Terrestrial and Aquatic Animal Health Codes 22 and FAO/WHO Codex Alimentarius Code of Practice to Minimize and Contain antimicrobial resistance.
4. Facilitate in conducting operational research on the area of antimicrobial stewardship for the informed decision making.
5. Facilitate in conducting operational research on the area of hygiene and IPC for the informed decision making.

Membership

The TWG will consist of the following members

SN	ORGANIZATION	RESPONSIBILITY
1	Among the MCC members	Chairperson
2	Representative MoH (Health Quality Assurance)	Member
3	Representative MoH (WASH)	Member
4	Ministry of Agriculture	Member
5	Ministry of Livestock and Fisheries (Livestock)	Member
6	Ministry of Livestock and Fisheries (Fisheries)	Member
7	Representative MoH (Nursing)	Member
8	Representative MoH (Director Curative)	Member
9	Representative MoH (PSU)	Member
10	Representative PORALG	Member
11	Representative NEMC	Member
12	Representative training institution (health)	Member
13	Representative training institution (animal)	Member
14	Representative Research Institution	Member
15	Any other co-opted member	

Schedule of Meeting

The regular meeting will be conducted on quartely basis or whenever the need arises and will be held as per government norms. Minutes of the meetings should be recorded and shared with the National Multi-sectoral AMR Coordinating Committee.

APPENDIX VIII: TERMS OF REFERENCE FOR ANTIMICROBIAL STEWARDSHIP - TECHNICAL WORKING GROUP

Purpose

Optimize the use of antimicrobial medicines in human and animal health, crops production and in the environment.

Scope

Provide technical support during the development and implementation of the AMR national action plan.

Roles and Responsibilities

The Antimicrobial Use Stewardship TWG is a national group that will advise the MCC on issues of Antimicrobial Use Stewardship to all stakeholders through the One Health Approach. The TWG is also responsible for technical guidance on implementation of the NAP with regards the following areas:

1. Strengthening regulation, their distribution, quality and use of antibiotics.
2. Monitoring antibiotic consumption;
3. Strengthening stewardship for antibiotic use in health facilities; Evidence-based prescribing and dispensing should be the standard of care.
4. Strengthen patient and health care provider compliance, the prevalence of substandard medicines for both human and veterinary use, and inappropriate or unregulated use of antimicrobial agents in agriculture.
5. Collected and reported data on consumption and use of antimicrobial agents in human and animal health and agriculture so that trends can be monitored and the impact of action plans assessed;
6. Facilitate in conducting operational research on the area of antimicrobial stewardship for the informed decision making.

Membership

The TWG will consist of the following members

SN	ORGANIZATION/INSTITUTION	RESPONSIBILITY
1	Among the MCC members	Chairperson
2	Representative Pharmacy Council	Member
3	Representative Tanzania Veterinary Council	Member
4	Representative Medical Council of Tanzania	Member
5	Representative Laboratory Council	Member
6	Representative PST	Member
7	Representative Wholesaler	Member
8	Representative MoH (PSU)	Member
9	Representative MLF (Livestock)	Member

10	Representative MLF (Fisheries)	Member
11	Representative Ministry of Agriculture	Member
12	Representative PORALG	Member
13	Representative training institution (Health)	Member
14	Representative Training institution (Animal)	Member
15	Representative training institutions	Member

Schedule of Meeting

The regular meeting will be conducted on quartely basis or whenever the need arises and will be held as per government norms. Minutes of the meetings should be recorded and shared with the National Multi-sectoral AMR Coordinating Committee.

APPENDIX IX: TERMS OF REFERENCE FOR MONITORING AND EVALUATION TECHNICAL WORKING GROUPS

Purpose

Monitor the progress for the implementation of NAP-AMR activities.

Scope

Provide technical support during the development and implementation of the AMR national action plan

Roles and Responsibilities

The AMR monitoring and evaluation technical working group shall have an independent task of collection, aggregation, analysis and reporting of NAP data generated by other AMR TWGs, implementers and other AMR partner projects:

1. Oversight over development of an M&E system/plan to track and monitor progress and performance of NAP implementation and provide feedback on adjustments or corrective measures required to achieve NAP's outcomes and goals.
2. Evaluate appropriateness, efficiency, effectiveness, impact and sustainability of NAP implementation at the times required and provide recommendations on the way forward based on lessons picked from NAP implementation M&E results chain.
3. Advise and develop policies and procedures on data management, data privacy and linkages.
4. Document best practices, challenges, lessons, gaps to best forge the way forward in NAP implementation
5. Review TrACSS data and submit to the MCC for endorsement before its submission to the WHO by the MCC Secretariat or any other appointed personnel.

Membership

The TWG will consist of the following members

SN	ORGANIZATION	RESPONSIBILITY
1	Among MCC member	Chairperson
2	Representative from research institutions	Member
3	Representative from AMR implementing partners	Member
4	Representative from MoH	Member
5	Representative from MLF	Member
6	Any other co-opted members	

Schedule of Meeting

The regular meeting will be conducted on quartely basis or whenever the need arises and will be held as per government norms. Minutes of the meetings should be recorded and shared with the National Multi-sectoral AMR Coordinating Committee.

APPENDIX X: MONITORING AND EVALUATION MATRIX

Planning	Input	Process/Activities	Output	Outcome	Impacts/Goal
	Resources	Activities	Results at a level of program	Results at level of population	Ultimate effect in the long term
Strengthen coordination, collaboration and governance for the implementation of AMR	Funds for coordination, collaboration and governance communication strategies for AMR coordination	Strengthen AMR Governance Structure at National Level	Functional AMR governance structure at national and subnational levels developed	Improved governance of AMR	Reduced impact of infectious diseases on human and animal health Continued ability to treat and prevent infectious diseases with effective and safe medicines Slower development of resistance (reduced emergence and spread of resistance or reduced levels)
		Establish AMR Governance Structure at Sub National Level			
		Conduct training on AMR, One Health, governance and coordination			
		Develop a web-based portal to share AMR surveillance publication and other information	Strengthen communication and collaborations on AMR		
		Advocate for strategies to increase the national budget contribution to One Health AMR interventions			
Monitoring and Evaluation to ensure that strategies are effective in responding to the antimicrobial resistance threats in the country	Funds for Monitoring and Evaluation Monitoring and Evaluation Guidelines Data from the human, animal, plant and environment sectors	Conduct baseline survey of NAP - AMR 2023-2028	NAP-AMR 2023 – 2028 monitored and evaluated	NAP-AMR 2023 – 2028 monitored and evaluated ensuring strategies are effective in responding to the AMR threats	
		Conduct monitoring for AMR annual operational plan			
		Conduct evaluation of NAP- AMR AMR 2023-2028			
		Document best practices of NAP – AMR			
		Develop TOR for M&E TWG functions			
		Organize meetings for monitoring and evaluation reports sharing			

Planning	Input	Process/Activities	Output	Outcome	Impacts/Goal
	Resources	Activities	Results at a level of program	Results at level of population	Ultimate effect in the long term
Create Awareness and Understanding of Antimicrobial Resistance through Effective Information, Education and Communication	Communication strategy for all stakeholders Funding for communication to the public and the professionals secured	Conduct a systematic review of KAPB studies to determine the country status in human	Campaigns to raise awareness and understanding of AMR risks and response in human health	Improved awareness of AMR and behaviour change among policy makers, farmers, veterinarians and health workers, food industry and the public	
		Translate and disseminate a communication strategy for AMR (Multisectoral Antimicrobial Resistance Communication Strategy: Moving from Awareness to Action 2020 – 2025)			
		Conduct commemoration of the World Antimicrobial awareness week			
		Conduct Training of Trainers (TOTs) at National, Regional and Council level on AMR			
		Conduct sensitization meetings to private and public stakeholders at National, Regional and Council levels on AMR			
		Conduct multimedia awareness campaigns on AMR			
		Establish AMR knowledge management and sharing mechanism at all levels			
		Establish AMR knowledge management and sharing mechanism at all levels			

Planning	Input	Process/Activities	Output	Outcome	Impacts/Goal
	Resources	Activities	Results at a level of program	Results at level of population	Ultimate effect in the long term
		Conduct a systematic review of KAPB studies to determine the country status in animal health, plant health, food production, food safety, and environment	Campaigns to raise awareness and understanding of AMR risks and response in animal health, plant health, food production, food safety and the environment		
		Translate and disseminate a communication strategy for AMR (Multisectoral Antimicrobial Resistance Communication Strategy: Moving from Awareness to Action 2020 – 2025)			
		Conduct commemoration of the World Antimicrobial awareness week			
		Conduct Training of Trainers (TOTs) at National, Regional and Council level on AMR			
		Conduct sensitization meetings to private and public stakeholders at National, Regional and Council levels on AMR			
		Conduct multimedia awareness campaigns on AMR			
		Establish AMR knowledge management and sharing mechanism at all levels			
		Establish AMR knowledge management and sharing mechanism at all levels			

Planning	Input	Process/Activities	Output	Outcome	Impacts/Goal
	Resources	Activities	Results at a level of program	Results at level of population	Ultimate effect in the long term
		Review, update and disseminate the existing education curricula in human	Training and professional education on AMR in the human health sector		
		Review, update and disseminate the existing CPD guidelines for human			
		Review, update and disseminate the existing education curricula in veterinary sector	Training and professional education on AMR in the veterinary sector		
		Review, update and disseminate the existing CPD guidelines for veterinary sector			
		Review, update and disseminate the existing education curricula on AMR in farming (animal and plant), food production, food safety and the environment	Training and professional education on AMR in farming (animal and plant), food production, food safety and the environment		
		Review, update and disseminate the existing CPD guidelines for AMR in farming (animal and plant), food production, food safety and the environment			
Strengthen the Knowledge and Evidence-Based through Surveillance and Research	Manual of procedures for Surveillance of AMR Manual of	Conduct surveillance on antimicrobial consumption and use at National and Sub-national levels in human health	Monitoring system for consumption and appropriate use of antimicrobials in human health	Strengthened knowledge and evidence base used for policy and practical decisions	

Planning	Input	Process/Activities	Output	Outcome	Impacts/Goal
	Resources	Activities	Results at a level of program	Results at level of population	Ultimate effect in the long term
	procedures for Surveillance of antimicrobial use Manual of and for Surveillance of antimicrobial residues in foods Funds for AMR surveillance Funding for IPC materials	Conduct surveillance on antimicrobial consumption and use at National and Sub-national levels in animals (terrestrial, aquatic) and plant production	Monitoring system for AMU in animals (terrestrial, aquatic) and plant production		
		Conduct surveillance on antimicrobial consumption and use at National and Sub-national levels in plant production	National monitoring system for AMU in plant production		
		Review the existing National AMR surveillance framework	Surveillance system for AMR in humans		
		Develop protocols and standard operating procedures (SOPs) for AMR surveillance in human			
		Collect samples for AMR surveillance			
		Package and transport collected samples to designated laboratories for AMR surveillance			
		Conduct training, mentorship, and supportive supervision for personnel on diagnostics and antimicrobial susceptibility testing			
		Support transportation of priority isolates to reference laboratories and biorepositories			

Planning	Input	Process/Activities	Output	Outcome	Impacts/Goal
	Resources	Activities	Results at a level of program	Results at level of population	Ultimate effect in the long term
		Review and update the master list for the materials/ reagents/ items required for AMR surveillance and supply mechanism to ensure constant availability			
		Building capacity of staff at the designated laboratory for AMR surveillance on supply chain management			
		Assess and enroll designated laboratories for AMR surveillance on the EQA program			
		Support reference laboratories to coordinate and distribute EQA materials for AMR surveillance			
		Support accreditation process to designated laboratories for AMR surveillance			
		Develop protocols and standard operating procedures (SOPs) for AMR surveillance in animal, food, agriculture, aquaculture, and environment			
		Develop protocols and standard operating procedures (SOPs) for AMR surveillance in human	Surveillance system for AMR in animals (terrestrial, aquatic), plants,		
		Collect samples for AMR surveillance			

Planning	Input	Process/Activities	Output	Outcome	Impacts/Goal
	Resources	Activities	Results at a level of program	Results at level of population	Ultimate effect in the long term
		Package and transport collected samples to designated laboratories	food and the environment		
		Develop and operationalize a multisectoral AMR surveillance reporting system			
		Review antimicrobial agents for residual surveillance in foods of animal and plant origin and environment.			
		Identify, assess, and support laboratories for testing antimicrobial residuals in food, aquaculture, and the environment			
		Develop and harmonize SOP and methods of testing the antimicrobial residual.			
		Collect and transport samples for antimicrobial residual surveillance			
		Assess the existing laboratory capacity and appoint one laboratory to be a national reference laboratory and select laboratories to carry out AMR surveillance in agriculture, foods, aquaculture, and environmental			

Planning	Input	Process/Activities	Output	Outcome	Impacts/Goal
	Resources	Activities	Results at a level of program	Results at level of population	Ultimate effect in the long term
		Conduct training, mentorship, and supportive supervision for personnel on diagnostics and antimicrobial susceptibility testing			
		Support transportation of priority isolates to reference laboratories and biorepositories			
		Review and update the master list for the materials/ reagents/ items required for AMR surveillance and supply mechanism to ensure constant availability			
		Building capacity of staff at the designated laboratory for AMR surveillance on supply chain management			
		Assess and enroll designated laboratories for AMR surveillance on the EQA program			
		Support reference laboratories to coordinate and distribute EQA materials for AMR surveillance			
		Support accreditation process to designated laboratories for AMR surveillance			
Reduce the Incidence of Infection through		Monitoring IPC in health facilities	IPC in human health care	Reduced incidence of	

Planning	Input	Process/Activities	Output	Outcome	Impacts/Goal
	Resources	Activities	Results at a level of program	Results at level of population	Ultimate effect in the long term
adequate Water supply, Sanitation, Hygiene and Infection Prevention Measures	Funding for IPC materials Infections and Control Guidelines Funding for IPC secured	Conduct advocacy and sensitization on IPC		infection in health facilities, farms and communities as well as reduced environmental contamination, due to effective prevention	
		Facilitate availability of IPC related equipment, supplies, utilities (water supply) and guidelines			
		Strengthening vaccination for human health			
		Design and introduce IPC interventions across animal health care setting	Good health, management, and hygiene practices to prevent infections and reduce the use of antimicrobials in animal and plant production and AMR transmission in food production		
		Strengthening vaccination and vector control programmes for animal health			
		Enforce use of international health regulation (IHR) through integrated disease surveillance and response (IDSR) and existing laws on outbreak prevention			
		Promote Food Chain Hygiene			
		Promote access to safe water at household level and congregations	Scaled up water supplies, sanitation, hygiene and immunization to reduce the spread of infections in communities and health facilities		
		Promote environmental sanitation and waste management			
		Promote Zoo sanitary and phytosanitary environmental settings			
		Strengthen monitoring system for waste management			

Planning	Input	Process/Activities	Output	Outcome	Impacts/Goal
	Resources	Activities	Results at a level of program	Results at level of population	Ultimate effect in the long term
		Promote management of emerging pollutants in terrestrial environment e.g., antimicrobial residues			
		Monitor disposal of antimicrobial in the environment			
		Prepare and disseminate policy brief			
Optimize the Use of Antimicrobial Agents in Human and Animal Health/ Stewardship	Antimicrobial stewardship Guidelines Prescription and Treatment Guidelines	Develop guidelines for handling and preservation of antimicrobial agents in human health	Optimized AMU in human health	Optimized use of antimicrobials in human and animal health; phased out animal use for growth promotion	
		Review National Medicines Policy to address AMR			
		Review and Disseminate National AWaRe List of antibiotics in human health			
		Review and disseminate STG/NEMLIT for human health, including AWaRe categorization of antimicrobials			
		Review and disseminate Medicines and Therapeutic Committee Guidelines for Human Health			
		Conduct regular inspection on pharmaceutical manufacturers			
		Establish a platform among the regulatory authorities to monitor and control of antimicrobial agents			

Planning	Input	Process/Activities	Output	Outcome	Impacts/Goal
	Resources	Activities	Results at a level of program	Results at level of population	Ultimate effect in the long term
		Establish AMS programmes in health care facilities			
		Develop, implement and monitor hospital formulary			
		Develop a system to monitor proper use of standard prescriptions			
		Monitor functionality of medicines and therapeutic Committees and other related committees			
		Provide capacity building to Medicines and Therapeutic Committees and other related committees on antimicrobial stewardship programs			
		Conduct supportive supervision to monitor antimicrobial stewardship programs			
		Develop guidelines for handling and preservation of antimicrobial agents in animals' health and aquatic animals	Optimized AMU in animal health		
		Develop/review and disseminate STG and NEMLIT in veterinary practice, livestock production, plant health and fisheries; and include A to D categorization of antibiotics for use in animals			
		Conduct regular inspection on pharmaceutical and agro-chemical outlets			

Planning	Input	Process/Activities	Output	Outcome	Impacts/Goal
	Resources	Activities	Results at a level of program	Results at level of population	Ultimate effect in the long term
		Establish joint strategy among the regulatory authorities to monitor proper use of antimicrobial agents in human, animals, aquatic, plant and environmental health			
		Conduct mentorship in slaughter houses abattoirs, slaughter slabs and aquatic farms to check compliance of withdraw periods and slaughter suitability			
		Establish a virtual networking platform on the use of preserved antimicrobials agents			
		Develop a system to monitor proper use of standard prescriptions			
		Develop guidelines for handling and preservation of antimicrobial agents in plant health	Optimized AMU in plant health		
		Develop guidelines for handling and preservation of antimicrobial agents in environmental health	Legislation and/or regulations to prevent contamination of the environment with antimicrobials		

Planning	Input	Process/Activities	Output	Outcome	Impacts/Goal
	Resources	Activities	Results at a level of program	Results at level of population	Ultimate effect in the long term
Research and Development	Funds for research	Engage relevant stakeholders to identify current gaps in knowledge and potential research topics.	Coordinated efforts, with defined priorities and established mechanisms to incentivize relevant R&D	Increased R&D on new medicines, diagnostics, vaccines and other interventions related to priority pathogens	
		Develop national research guidelines on AMR.			
		Establish policy guidelines to address AMR data security and sharing in the country			
		Conduct AMR research activities	Increased investment in R&D to address AMR and prevent infection		
		Establish and operationalize the national bio-bank as source of isolates for AMR research in the country			
		Identify and utilize different approaches for dissemination of AMR research findings			
		Establish and sustain a national AMR data repository			

Appendix XI: Key Performance Indicators

Note

Baseline information is missing for some indicators hence, the Technical Working Group responsible for monitoring and evaluation will collect baseline data and set targets for 2023-2028.

Strategic Objectives	Indicator	Type of Indicator	Data Source	Frequency	Means of Verification	Baseline	Year Target (2023 -2028)				
							1	2	3	4	5
1. Strengthen coordination, collaboration and governance for NAP on AMR implementation	1. 1. AMR multi-sectoral governance strengthened at national level	Output	MCC reports	Quarterly	Minutes of meetings						
	1.2. AMR multi-sectoral governance established and strengthened at subnational level	Output	MCC reports	Bi-annual	Minutes of meetings/ workshops						
2. create awareness and understanding of antimicrobial resistance through effective information, education and communication	2. 1. Increased number of AMR awareness campaigns targeting priority stakeholder groups (human, animal & plant health, food production, food safety and environment)	Output	MCC reports	Routine	AMR awareness reports						
	2.2. Increased number of Policy Makers who understand and support AMR interventions	Output	MCC Reports	Routine	AMR awareness reports						
	2.3. Increased proportion of health, animal, agriculture and environmental professionals demonstrating AMR competencies	Outcome	Workshop / CPD/ interviews	Routine	Workshop/ training/ assessment reports						
	2.4 Increased number of ministries/ institutions/organizations commemorate WAAW	Output	Media and institutions/ organizations	Annually	WAAW report						

	2.5 Proportion of human, livestock, agriculture and environmental health training institutions incorporated AMR in their curricular	Output	Institution training curriculum	Annually	Document review						
	2.6 Tailor-made curricula on AMR developed for pre-primary, primary, secondary schools	Output	Primary, secondary schools training curricula	Annually	Document review						
3. Strengthen the knowledge and evidence-based through surveillance and research	3.1 Number of laboratories included in the national AMR surveillance system in the human sector with the capacity to perform antimicrobial susceptibility testing and/or bacterial isolation	Output	NPHL database	Annually	Observation/ Document review						
	3.2 Percentage increase in AMR data submitted to WHO-GLASS	Output	NPHL Database / MCC reports	Annually	Observation/ Document review						
	3.3. Number of laboratories included in the national AMR surveillance system in the animal sector with capacity to perform antimicrobial susceptibility testing and/or bacterial isolation	Output	CVL database	Annually	Observation/ Document review						
	3.4. Number of AMR surveillance Laboratories in agriculture, aquaculture, foods, and the environment strengthened	Output	MoA/TBS/ NEMC database	Annually	Observation/ Document review						

	3.5. Number of labs serving the national AMR surveillance sites covered by external quality assurance	Output	NPHL/ CVL database	Annually	Observation/ Document review						
	3.6. National system of AMR surveillance established and strengthened for priority foodborne pathogens	Output	Surveillance report	Annually	Observation/ Document review						
	3.7. A system for monitoring (passive surveillance) of antimicrobial compounds and their metabolites (or residues) and resistant bacteria or antimicrobial resistance genes (ARGs) in water quality established	Output	MCC and TWGs report	Annually	Observation/ Document review						
	3.8. National human consumption of antibiotics for systemic use (ATC classification) in Defined Daily Doses per 1000 population (or inhabitants) per day determined, disseminated and report submitted to WHO GLASS	Output	TMDA/MSD/ Local Manufacturers	Annually	Observation/ Document review						
	3.9. Surveillance system for antimicrobial use in selected health facilities established (using PPS methodology), disseminated and report submitted to WHO GLASS	Output	MoA/ Hospitals	Annually	Observation/ Document review						
	3.10 Total volume of antimicrobial sales/imports (or use), in mg/kg biomass, in food-producing animals determined, reported, disseminated, and submitted to WOAH.	Output	TMDA database	Annually	Observation/ Document review						

	3.11. Total quantity of antimicrobial use in crop production, by antimicrobial class collected and reported	Output	MCC report/ MoA	Annually	Observation/ Document review						
	3.12. Proportion of health care and veterinary facilities utilizing AST data to inform their decision of choice of antimicrobials	Output	Facilities report	Annually	Observation/ Document review						
4. Reduce the incidence of infection through effective sanitation, hygiene, and infection prevention, and on-farm biosecurity	4.1 Proportion of healthcare facilities with established IPC programs addresses the core components defined by MoH	Outcome	DHIS2/ Research findings	Quarterly	Document review						
	4.2. Proportion of health care facilities with quality water supply and in-premise sanitation facilities	Outcome	DHIS2/ Research findings	Annually	Survey reports						
	4.3. Reduction of incidence of surgical site infection in health facilities	Outcome	DHIS2/ Research findings	Annually	Document review						
	4.4. Reduction of incidence of Neonatal sepsis in health facilities	Output	DHIS2/ Research findings	Annually	Observation/ Document review						
	4.5. Number of IPC programs in animal, Aquatic, plant health services and Environmental Management established	Output	Survey Reports	Annually	Observation/ Document review						
	4.6. Reduced residues of antimicrobial compounds and antimicrobial resistant pathogens in the environment	Outcome	Research findings	Annually	Document review						

5. Optimize the use of antimicrobial agents in human and animal health	5.1 Number of health facilities with functional AMS programme	Output	Health Facilities AMS Core elements assessment report	Annually	Observation/ Document review						
	5.2. Number of AMS programs in animal sector Established	Outcome	Supervision/ inspections/ research findings	Annually	Observation/ Document review						
	5.3. Percentage of hospital patients receiving an antibiotic according to AWaRe categories	Outcome	Supervision/ inspections/ research findings	Annually	Observation/ Document review						
	5.4. Percentage of inpatient surgical procedures with appropriate timing and duration of surgical antibiotic prophylaxis	Output	Supervision/ inspections/ research findings	Annually	Observation/ Document review						
	5.5. Number of National ABCD List of antibiotics in veterinary secto reviewed and disseminated	Output	Supervision/ inspections/ research findings	Annually	Observation/ Document review						
	5.6. Number of post-market survey on antimicrobials conducted in human sector	Outcome	TMDA data base	Annually	Observation/ Document review						
	5.7. Number of post-market survey on antimicrobials conducted in animal sector (terrestrial, aquatic)	Output	TMDA data base	Annually	Observation/ Document review						

	5.8. Increased evidence based decisions on antimicrobial use	Outcome	Research findings/ policy documents/policy briefs	Annually	Observation/ Document review						
6. sustainable investments for antimicrobial resistance interventions	6.1. Amount of funds allocated and released in the national budgets for implementation of the National AMR action plan for responsible sectors	Output	Responsible ministries/ institutions annual budget	Annually	Observation/ Document review						
	6.2. Increased human resource capacity in various AMR related fields (fellowships, masters & PhDs)	Outcome	MCC Secretariat data base	Annually	Observation/ Document review						
	6.3. Availability of national data that estimates the economic impact of antimicrobial resistance at national level in all relevant sectors	Output	Research findings	Annually	Observation/ Document review						

APPENDIX XII: THE NAP-AMR 2023-2028 COSTED ACTIVITIES (TZS)

Total costs is Tanzania shillings 61,541,380,950/= distributed in the fillowing six strategic areas				
Strategic Objective	**1**	**1**	**Governance**	**2,369,702,017**
Objective	**2**	**1.1**	**Strengthen coordination, collaboration and governance for the implementation of AMR**	**2,369,702,017**
Intervention	**3**	1.1.1	Establish and strengthen governance structures to tackle AMR	1,797,547,395
Activity	**4**	1.1.1.1	Strengthen an AMR governance structure at national level.	944,885,109
Activity	**4**	1.1.1.2	Establish an AMR governance structure at Sub national level	530,023,720
Activity	**4**	1.1.1.3	Conduct training on AMR, One Health, governance and coordination	322,638,566
Intervention	**3**	1.1.2	Strengthen communication and collaborations on AMR	27,340,750
Activity	**4**	1.1.2.1	Develop a web-based portal to share AMR surveillance publication and other information	27,340,750
Activity	**4**	1.1.2.2	Advocate for strategies to increase the national budget contribution to One Health AMR interventions	0
Intervention	**3**	1.1.3	Monitor and evaluate NAP-AMR 2023 - 2028	544,813,872
Activity	**4**	1.1.3.1	Conduct baseline survey of NAP - AMR 2023-2028	63,125,000
Activity	**4**	1.1.3.2	Conduct monitoring of NAP - AMR 2023-2028	388,561,613
Activity	**4**	1.1.3.3	Document best practices of NAP – AMR	93,127,259
Strategic Objective	**1**	2	**Awareness and Education**	**4,580,344,679**
Objective	**2**	**2.1**	**Increase national awareness on AMR**	**4,206,929,619**
Intervention	**3**	2.1.1	Establish evidence-based public communications on AMR targeting human, animal and plant including food chain.	556,759,169
Activity	**4**	2.1.1.1	Conduct a systematic review of KAPB studies to determine the country status in all sectors	321,494,019
Activity	**4**	2.1.1.2	Translate and disseminate a communication strategy for AMR and other relevant AMR documents	235,263,150
Intervention	**3**	2.1.2	Advocate for AMR and Conduct campaigns	3,604,432,450
Activity	**4**	2.1.2.1	Conduct commemoration of the World Antimicrobial Awareness Week and other relevant national and international ceremonies/exibitions	1,029,145,514
Activity	**4**	2.1.2.2	Conduct Training of Trainers (TOTs) at National, Regional and Council level on AMR	1,073,045,513
Activity	**4**	2.1.2.3	Conduct sensitization meetings to private and public stakeholders at National, Regional and Council levels on AMR	800,524,953
Activity	**4**	2.1.2.4	Conduct multimedia awareness campaigns on AMR	701,716,490
Intervention	**3**	2.1.3	Develop knowledge sharing mechanism at all levels (web portal, social media handles and mobile apps)	45,740,000
Activity	**4**	2.1.3.1	Establish AMR knowledge Management and sharing mechanism at all levels	45,740,000
Objective	**2**	**2.2**	**Improve knowledge on AMR**	**373,415,060**
Intervention	**3**	2.2.1	Include AMR as a core component of professional education, training, certification, and development	283,929,060

Activity	**4**	2.2.1.1	Develop and integrate tailor-made curricula learning outcomes on AMR for pre-primary, primary and secondary schools	283,929,060
Intervention	**3**	2.2.2	Include AMR as a core component of Continuing Professional development (CPD)	89,486,000
Activity	**4**	2.2.2.1	Advocate that CPD/short courses on AMR and one health become mandatory courses for actors of all respective sectors	89,486,000
Strategic Objective	**1**	**3**	**AMR Surveillance and Research**	**27,953,082,645**
Objective	**2**	**3.1**	**Strengthen National Surveillance System for Antimicrobial Resistance**	**8,524,310,138**
Intervention	**3**	3.1.1	Develop or review guiding documents for AMR Surveillance	1,021,521,600
Activity	**4**	3.1.1.1	Review the existing National AMR surveillance framework	683,671,600
Activity	**4**	3.1.1.2	Develop protocols and standard operating procedures (SOPs) for AMR surveillance in human, animal, food, agriculture, aquaculture, and environment	337,850000
Intervention	**3**	3.1.2	Conduct AMR surveillance in human, animal, food, agriculture, aquaculture, and environment	4,018,271,796
Activity	**4**	3.1.2.1	Collect samples for AMR surveillance	4017,047,566
Activity	**4**	3.1.2.2	Package and transport collected samples to designated laboratories for AMR surveillance	1,224,240
Intervention	**3**	3.1.3	Develop a multisectoral AMR surveillance reporting system	155,462,855
Activity	**4**	3.1.3.1	Develop and operationalize a multisectoral AMR surveillance reporting system	155,462,855
Intervention	**3**	3.1.4	Strengthen AMC and AMU surveillance in human, animal, aquaculture, and agriculture	1,536,893,776
Activity	**4**	3.1.4.1	Conduct regular AMC/AMU surveys and surveillance on selected antimicrobial agents in human and animal sectors	1,536,893,776
Intervention	**3**	3.1.5	Strengthen surveillance of antimicrobial residual	1,792,160,111
Activity	**4**	3.1.5.1	Review antimicrobial agents for residual surveillance in foods of animal and nplant origin and environment	50,045,500
Activity	**4**	3.1.5.2	Identify, assess, and support laboratories for testing antimicrobial residuals in food, aquaculture, and environment	17,170,000
Activity	**4**	3.1.5.3	Develop and harmonize SOP and methods of testing the antimicrobial residual	48,379,000
Activity	**4**	3.1.5.4	Build technical and infrastructural capacity in the identified laboratories for antimicrobial residual testing	1,109,742,955
Activity	**4**	3.1.5.5	Collect and transport of samples for antimicrobial residual surveillance	566,822,656
Objective	**2**	**3.2**	**Strengthen Laboratory capacity to produce high-quality microbiological**	**16,754,573,307**
Intervention	**3**	3.2.1	Designate and strengthen Laboratories for AMR surveillance in agriculture, aquaculture, foods, and the environment	2,645,707,115
Activity	**4**	3.2.1.1	Assess the existing laboratories' capacity and select one laboratory to be a national reference laboratory for AMR surveillance in agriculture, food, aquaculture, and the environment	2,645,707,115
Intervention	**3**	3.2.2	Capacity building for designated laboratories for AMR surveillance in human, animal, food, agriculture, aquaculture, and environment.	1,335,119,299

Activity	**4**	3.2.2.1	Conduct training, mentorship, and supportive supervision for personnel on diagnostics and antimicrobial susceptibility testing	617,917,289
Activity	**4**	3.2.2.2	Support transportation of priority isolates to reference laboratories and biorepositories	717,202,010
Intervention	**3**	3.2.3	Strengthen the supply chain system to support laboratory AMR surveillance	9,339,332,277
Activity	**4**	3.2.3.1	Review and update the master list for the materials/ reagents/ items required for AMR surveillance and supply mechanism to ensure constant availability	35,093,177
Activity	**4**	3.2.3.2	Building capacity of staff at the designated laboratory for AMR surveillance on supply chain management	10,304,229,100
Intervention	**3**	3.2.4	Strengthen quality management system for designated laboratories for AMR surveillance	3,434,424,616
Activity	**4**	3.2.4.1	Assess and enroll designated laboratories for AMR surveillance on the EQA program	1,034,038,002
Activity	**4**	3.2.4.2	Support reference laboratories to coordinate and distribute EQA materials for AMR surveillance	2,055,653,004
Activity	**4**	3.2.4.3	Support accreditation process to designated laboratories for AMR surveillance	344,733,610
Objective	**2**	**3.3**	**Strengthen research and development in addressing antimicrobial resistance**	**2,674,199,200**
Intervention	**3**	3.3.1	Integrate AMR in respective sectoral research agenda	905,449,200
Activity	**4**	3.3.1.1	Engage relevant stakeholders to identify current gaps in knowledge and potential research topics	72,300,000
Activity	**4**	3.3.1.2	Develop national research guidelines on AMR	270,189,200
Activity	**4**	3.3.1.3	Conduct AMR research activities	204,580,000
Activity	**4**	3.3.1.4	Establish and operationalize the national bio-bank as source of isolates for AMR research in the country	358,380,000
Intervention	**3**	3.3.2	Establish and support a framework for dissemination, storage and sharing of AMR research findings	1,768,750,000
Activity	**4**	3.3.2.1	Identify and utilize different approaches for dissemination of AMR research findings	900,400,000
Activity	**4**	3.3.2.2	Establish policy guidelines to address AMR data security and sharing in the country	53,150,000
Activity	**4**	3.3.2.3	Establish and sustain a national AMR data repository	815,200,000
Strategic Objective	**1**	**4**	**IPC**	**15,578,376,279**
Objective	**2**	**4.1**	**Strengthen infection prevention and control Programs**	**11,353,692,945**
Intervention	**3**	4.1.1	Promoting IPC programmes in all human health care settings	5,860,013,488
Activity	**4**	4.1.1.1	Conduct scheduled supportive supervision to all health facilities by quality assurance teams (Ministry level, RHMT, CHMT)	2,088,208,947
Activity	**4**	4.1.1.2	Conduct advocacy and sensitization on IPC	1,328,647,164
Activity	**4**	4.1.1.3	Facilitate availability of IPC related equipment, supplies, utilities (water supply) and guidelines	2,443,157,377
Intervention	**3**	4.1.2	Strengthen vaccination Programme in human	1,683,632,655
Activity	**4**	4.1.2.1	Strengthening vaccination and vector control programmes in human	1,683,632,655
Intervention	**3**	4.1.3	Establish and design IPC programmes in animal, aquatic, plant health services and Environmental Management	2,645,961,005
Activity	**4**	4.1.3.1	Design and introduce IPC interventions across animal health care setting	2,645,961,005
Intervention	**3**	4.1.4	Strengthen vaccination Programme in human and animal health	480,832,233

Activity	**4**	4.1.4.1	Strengthening vaccination and vector control programmes for animal health	480,832,233
Intervention	**3**	4.1.5	Strengthening community IPC, linkages and Partnership for IPC	683,253,564
Activity	**4**	4.1.5.1	Engage communities on implementation of personal hygiene and environmental sanitation	417,958,200
Activity	**4**	4.1.5.2	Promote Food Chain Hygiene	265,295,364
Objective	**2**	**4.2**	**Strengthen health waste management at all levels**	**4,524,683,334**
Intervention	**3**	4.2.1	Develop and strengthen system for health waste management in the public sector	3,952,374,966
Activity	**4**	4.2.1.1	Promote environmental sanitation and waste management	1,547,192,726
Activity	**4**	4.2.1.2	Promote Zoosanitary and phytosanitary environmental settings	1,033,236,490
Activity	**4**	4.2.1.3	Strengthen national and subnational monitoring system in the field of waste management	1,040,147,920
Activity	**4**	4.2.1.4	Promote management of emerging pollutants in terrestrial environment e.g., antimicrobial residues and others	114,681,000
Activity	**4**	4.2.1.5	Monitor disposal of antimicrobial in the environment	212,116,830
Intervention	**3**	4.2.2	Establish evidence-based policies to guide management of antimicrobial residues in the environment	572,308,368
Activity	**4**	4.2.2.1	Conduct Systematic Review on antimicrobial residue in aquatic and terrestrial environment in all sectors to identify gaps	572,308,368
Strategic Objective	**1**	**5**	**Optimize use**	**4,814,203,124**
Objective	**2**	**5.1**	**Strengthen regulatory system for production, supply and prudent use of antimicrobial agents**	**3,898,313,124**
Intervention	**3**	5.1.1	Review Policies, Laws, Regulations and Develop Guidelines on prescriptions and use of antimicrobial agents in human, animals, plant, environmental health and aquatic animals	2,980,873,502
Activity	**4**	5.1.1.1	Develop guidelines for handling and preservation of antimicrobial agents in animals, plant, environmental health and aquatic animals	717,220,360
Activity	**4**	5.1.1.2	Develop operational guidelines for implementation of AMS at National, Sub-national level and Private sectors in human health	106,163,054
Activity	**4**	5.1.1.3	Develop/review and disseminate STG and NEMLIT in veterinary practice, livestock production, plant health and fisheries; and include A to D categorization of antibiotics for use in animals	196,657,100
Activity	**4**	5.1.1.4	Review and Disseminate National AWaRe List of antibiotics in human health	381,904,028
Activity	**4**	5.1.1.5	Review and disseminate STG/NEMLIT for human health, including AWaRe categorization of antimicrobials	354,726,140
Activity	**4**	5.1.1.6	Review and Disseminate Medicines and Therapeutic Committee Guidelines for Human health sector	1,224,202,820
Intervention	**3**	5.1.2	Monitor proper use of antimicrobial agents	917,439,622
Activity	**4**	5.1.2.1	Conduct regular inspection on pharmaceutical and agro chemical outlets	618,514,622

Activity	**4**	5.1.2.2	Establish a platform among the regulatory authorities to monitor proper use of antimicrobial agents in human, animals, aquatic, plant and environmental health	257,425,000
Activity	**4**	5.1.2.3	Conduct mentorship in slaughter houses, abattoirs, slaughter slabs and aquatic farms to check compliance of withdraw periods and slaughter suitability	41,50,000
Objective	**2**	**5.2**	**Ensure appropriate use of antimicrobial agents**	**915,890,000**
Intervention	**3**	5.2.1	Establishment antimicrobial stewardship programmes in animal sector; and strengthening of AMS programmes in human sectors	235,445,000
Activity	**4**	5.2.1.1	Establish AMS programmes in hospitals	28,620,000
Activity	**4**	5.2.1.2	Establish AMS programmes in animal sector	32,825,000
Activity	**4**	5.2.1.3	Develop a system to monitor proper use of standard prescriptions in human, animal and aquatic sector	124,800,000
Activity	**4**	5.2.1.4	Develop, implement and monitor hospital formulary	69,200,000
Intervention	**3**	5.2.2	Monitor antimicrobial Stewardship programmes in Human and Animal Sector	66,445,000
Activity	**4**	5.2.2.1	Establish medicines and therapeutic Committees in veterinary sector	98,700,000
Activity	**4**	5.2.2.2	Strengthen Medicines and Therapeutic Committees and other related committees on antimicrobial Stewardship programs	418,480,000
Activity	**4**	5.2.2.3	Conduct supportive supervision to monitor antimicrobial Stewardship programs in human and animal sectors	143,480,000
Strategic Objective	**1**	**6**	**Sustainable investment**	**6,245,672,206**
Objective	**2**	**6.1**	**Establish a sustainable investments mechanism for antimicrobial resistance interventions**	**6,245,672,206**
Intervention	**3**	6.1.1	Determine economic impact of AMR	202,112,413
Activity	**4**	6.1.1.1	Conduct economic evaluation to determine expenditures for treatment of infectious disease	64,478,400
Activity	**4**	6.1.1.2	Conduct economic evaluation to determine expenditures for treatment of patients with AMR	45,692,400
Activity	**4**	6.1.1.3	Prepare a policy brief to address the impact of AMR based on the findings	91,941,613
Intervention	**3**	6.1.2	Mobilize funds to support AMR interventions	670,390,093
Activity	**4**	6.1.2.1	Map the AMR stakeholders in the country	302,633,065
Activity	**4**	6.1.2.2	Engage and establish linkage with relevant stakeholders to support the implementation of NAP AMR	366,857,028
Activity	**4**	6.1.2.3	Engage Policy makers to support the implementation of NAP-AMR	900,000
Intervention	**3**	6.1.3	Improve human resource capacity for AMR interventions	18,356,750
Activity	**4**	6.1.3.1	Develop a data base for competent workforce on AMR	18,356,750
Activity	**4**	6.1.3.2	Identify AMR capacity gaps and develop a sustainable workforce on AMR	0
Intervention	**3**	6.1.4	Strengthen infrastructure for a sustainable AMR intervention	5,133,769,400
Activity	**4**	6.1.4.1	Map laboratories in human, animal, food safety and environmental sectors to determine their capacities to perform AMR	221,043,550
Activity	**4**	6.1.4.2	Prioritize and strengthen laboratories for sustainable AMR interventions	5,133,769,400