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NATIONAL ACTION PLAN FOR THE FIGHT AGAINST ANTIMICROBIAL RESISTANCE 2024-2028

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National Action Plan for the fight against Antimicrobial Resistance (2024-2028 NAP-AMR)

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PREFACE

Antimicrobial Resistance (AMR) is a global concern for human, animal, plant as well as environmental health. It has serious direct consequences notably, disease management, extended treatment duration, extended patient stay in health facilities, increase in treatment costs and mortality, as well as loss of production. Antimicrobial resistance, in the absence of new antibiotics, has become one of the most serious public health issues. The situation is worse in developing countries, including Cameroon, due to doubtful supply and uncontrolled use of antimicrobials.

To handle this phenomenon will require the combined efforts of the various administrations concerned. To help countries address this new challenge, a Global Action Plan (GAP) on AMR was developed in 2015 by the tripartite collaboration of the World Health Organisation (WHO), the Food and Agriculture Organisation of the United Nations (FAO) and the World Organisation for Animal Health (WOAH). This collaboration became quadrupled in 2022 with the membership of the United Nations Programme for Environment (UNPE).

The Joint External Evaluation (JEE) of the International Health Regulations (IHR) conducted in Cameroon in 2017 on AMR control recommended the elaboration of a National Action Plan for the fight against AMR (NAP-AMR). The first National Action Plan on AMR elaborated for the 2018–2020 period enabled awareness activities, and putting in place of the laboratory surveillance system. This plan equally contributed to the re enforcement, prevention and control of infections. The new NAP-AMR (2024-2028) will enable the elaboration of the governance system and re enforce the optimization of the proper use of antimicrobials. It was developed using the 'One Health' approach with the participation of the human, animal, plant and environmental health sectors. This plan is in alignment with the 2023 regional strategy, which encourages the government and the different sectoral partners to mobilise and coordinate their efforts to fight against AMR. This effort contributes to world sanitary security, the instauration of the universal sanitary coverage and attaining long lasting development objectives.

The fight against AMR is in direct alignment with the vision of the Head of State to make Cameroon an emerging country by 2035.

I therefore invite all stakeholders to mutualise their efforts for an efficient implementation of this National action plan.

ACKNOWLEDGEMENTS

The National Action Plan for the fight against Antimicrobial Resistance (2024–2028 NAP-AMR) is the result of an active multi-sectoral collaboration between national experts in human, animal, plant and environmental health, with technical and financial support from partners for development

We are very grateful to all stakeholders for their contributions and multifaceted support in the development and finalisation of this document.

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ABREVIATIONS AND ACRONYMS

AM	Antimicrobials
AIDS	Acquired Immunodeficiency Syndrome
AMR	Antimicrobial Resistance
AMU	Antimicrobial Use
AP	Agricultural Position
AST	Antimicrobial Susceptibility Testing
CDC	Centers for Disease Control and Prevention
CPC	Centre Pasteur Cameroon
DAD	Department of Agricultural Development
DPDL	Department of Pharmacy and Drug Laboratories
DHP	Department of Health Promotion
DRCQ	Department of the Regulation and Quality Control of Agricultural Products and Inputs
DVS	Department of Veterinary Services
ECP	Environmental Control Post
FAO	Food and Agriculture Organisation
GAP	Global Action Plan
GESP	Growth and Employment Strategy Paper
GIZ-PPOH	*Gesellschaft fûr Internationale Zusammenarbeit* – Global Programme on Pandemic Prevention and Response, One Health
GLASS	Global Antimicrobial Resistance Surveillance System
HF	Health Facility
HIV	Human Immunodeficiency Virus
HSS	Health Sector Strategy
ICS	International Classification for Standards
IHR	International Health Regulations
IPC	Infection Prevention and Control
JEE	Joint External Evaluation
KAP	Knowledge, Attitudes and Practices
LANAVET	National Veterinary Laboratory
LNAD	National Laboratory for the Diagnostic Analysis of Agricultural Products and Inputs
MAAP	Mapping AMR and AMU Partnership
MCC	Multi-sector Coordination Committee
MDR	Multi-Drug Resistant
MINADER	Ministry of Agriculture and Rural Development

MINEPDED	Ministry of Environment, Nature Protection and Sustainable Develop
MINEPIA	Ministry of Livestock, Fisheries and Animal Industries
MINPH	Ministry of Public Health
NAP	National Action Plan
NAPHS	National Action Plan on Health Security
NCC	National Coordination Centre
NPHL	National Public Health Laboratory
PMP	Progressive Management Pathway
QMS	Quality Management System
QWArS	Qualifying the Workforce for AMR surveillance in Africa and Asia
RLA	Regional and Local Authority
SDG	Sustainable Development Goal
SOP	Standard Operating Procedure
SWOT	Strengths, Weaknesses, Opportunities and Threats
TFP	Technical and Financial Partners
TWG	Technical Working Group
UNPE	United Nations Program for Environment
USAID	United States Agency for International Development
WHO	World Health Organisation
WOAH	World Organisation for Animal Health

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SUMMARY

The National Action Plan for the fight against Antimicrobial Resistance (2024–2028 NAP-AMR) is a national scoped multi-sectoral document. The goal of the 2023–2027 NAP-AMR is to efficiently fight against antimicrobial resistance through the responsible use of good quality and affordable antimicrobials/pesticides by those who need them. The 2024–2028 NAP-AMR is developed based on the *', One health' concept* in line with the Global Action Plan for the fight against Antimicrobial Resistance (AMR).

Getting inspiration from the 2018–2020 NAP-AMR and the situation analysis of AMR carried out in June 2022, this plan takes into account indicators of the Joint External Evaluation of the International Health Regulations. It comprises five strategic objectives on which actions and priority activities to be carried out from 2024-2028 rely. These objectives seek to (1) improve awareness and the understanding of AMR through effective communication, education and training; (2) re enforce knowledge and base evidence through surveillance and research; (3) reduce the incidence of infections by applying effective sanitation, hygiene and infection prevention measures; (4) optimise the use of antimicrobials in human, animal, plant and environmental health; (5) improve the management process and governance in the administrations involved in the fight against AMR through strengthening standardisation, monitoring-evaluation, regulation and admissibility.

As part of the development and implementation of the 2018 – 2020 NAP-AMR, the AMR focal points were officially appointed and trained in the four key sectors: MINPH, MINEPIA, MINADER, MINEPDED. Despite the efforts made, no formal coordination structure has been set up.

This document is structured around the following sections: the presentation of the methodological approaches used, general information about Cameroon, the situation analysis of AMR in Cameroon, the logical framework, the budgeting of planned activities and the monitoring-evaluation framework.

METHODOLOGICAL APPROACH FOR THE DEVELOPMENT OF THE 2024-2028 NAP - AMR

The 2024–2028 NAP-AMR is the result of an activity, which took place in two stages: situation analysis and development of the Plan.

1- Situation analysis

It focused on the assessment of the implementation level of the 2018–2020 NAP-AMR and the situation analysis of AMR in human, animal, plant and environmental health.

- To this effect, a monitoring-evaluation matrix was developed from that of the 2018–2020 NAP-AMR and the indicators from the 3rd edition of the 2017 JEE. It was updated during working sessions with authorities from different administrations under the coordination of the National Public Health Laboratory (NPHL).
- Data was also collected from national and international partner organisations involved in the fight against AMR in Cameroon, notably the Zoonosis Programme, the National Public Health Observatory (NPHO), World Health Organisation, Food Agriculture Organisation, USAID (IDDS, MTAPs).
- Finally, a documentary review was carried out, specifically with the use of various stakeholder activity reports, scientific publications, Standard Operating Procedure (SOP) manuals, the National Action Plan for Health Security (NAPHS), the national situation analysis workshop report on AMR and Antimicrobial Use (AMU), etc. Data collected at different levels was used to evaluate the fight against AMR.
- The situation analysis also consisted in identifying strengths, weaknesses, opportunities and threats, as well as the main challenges to face.
- The restitution of this analysis was presented during a working session that brought all the stakeholders together, at the end of which guidelines for the development of the new plan was formulated.

2- Development Plan

This consisted of:

- The development of the 2024–2028 NAP-AMR following a participatory approach based on meetings and consultations with other administrations (MINPH, MINEPIA, MINADER, MINEPDED).
- From the challenges identified during the situation analysis, five strategic objectives were retained in connection with the Global Action Plan for AMR for each strategic objective; actions were formulated based on the four revised Joint External Evaluation (JEE) indicators **(1)**. Actions were selected according to priority based on targets projected for 2028. Activities were identified and costs estimated using the 'WHO Activity Cost and Budgeting Tool of the AMR national action plan **(2)**.
- Several working sessions with focal points, and the finalization and proofreading workshops, made it possible to finalise the document. The finalised document was validated during a workshop that brought together all stakeholders. Funding for all these activities was provided by technical and financial partners (TFPs), notably WHO, FAO, IDDS, GIZ, MTaPs.

CHAPTER I

GENERAL INFORMATION ABOUT CAMEROON

1.1. PHYSICAL ENVIRONMENT

Cameroon is a Central African country located at the bottom of the Gulf of Guinea, between Latitudes 2 and 13° North and Longitudes 9 and 16° East. With a surface area of 475,650 km², it is triangular, has a maritime border of 420 km along the coast of the Atlantic Ocean, a land border of 4,591 km with Nigeria to the West, Chad in the North East, the Central African Republic in the East, Congo, Gabon and Equatorial Guinea in the South. At the top of the triangle, to the north, the country is bordered by Lake Chad (**1, 3**),

The country has a contrasting relief, with highland regions unevenly distributed across the national territory and surrounded by narrow plains. In the Far North, the Mandara Mountains peak on average at 1000 metres above sea level, while the Adamawa plateau reaches 1100 metres high. The West is characterised by highlands made up of plateaus of 1200 to 1800 metres above sea level and a mountain range including Mount Cameroon, originating from the Atlantic Coast, culminating at 4070 metres **(4)**.

Vegetation is not left out in terms of diversity. The southern and eastern part of the country is characterised by the equatorial forest while we find the savannah in the west, and the steppe in the north **(4)**.

On the agro-climatic and geomorphological level, Cameroon has five agro-ecological zones which are from North to South:

- **The Sudano-Sahelian zone** covers the Far North, the North and part of Adamawa, with a rainfall of 400 to 1,200 mm/year, and a monomodal regime. The soil shows a great diversity (ferruginous, leached, hydromorphic, alluvial, lithosoils, vertisoils, etc.) and the main crops are cotton, millet-sorghum, cowpeas, onion and sesame.
- **The high savannah zone** covers the Adamawa plateau and part of the Centre. The average rainfall is 1,500 mm/year. The soils are permeable, with an average water retention capacity, and are brown or red,ironicand hydromorphic.

The latter favours the cultivation of corn, cotton, millet-sorghum, yams and potatoes.

- **The high plateau zone** covers the West and North West regions, with rainfall of about 1,500 to 2,000 mm/year, equivalent to 180 days of rain per year. Soils enriched with volcanic materials are very fertile and conducive for agricultural activities; the main crops are cocoa, coffee, corn, beans, potatoes and market gardening.
- **The bimodal forest zone** extends over the South, Centre and East regions; with a rainfall of 1,500 to 2,000 mm/year with two distinct rainy seasons. The soils are ironic, acidic, clayey with a low nutrient retaining capacity suitable for crops such as cocoa, coffee, cassava, plantain, corn, palm oil, pineapple, etc.
- **The mono-modal forest zone** covers the South-West, Littoral and part of the South Region. The average rainfall is 2,500 to 4,000 mm/year and is monomodal. The soils are volcanic slopes, with significant deposits of sedimentary rocksalong the coast. The main crops in this area are: cocoa, banana, coffee, plantain, palm trees, ginger and pepper.

Cameroon ranked 68th on the global climate risk index in 2021. The country is subject to flooding, deforestation, recurrent droughts in several parts of the territory **(5).**

1.2. POLITICAL AND ADMINISTRATIVE ORGANISATION

Cameroon is a decentralised and democratic State. The January 1996 constitution established the separation of powers: the executive is exercised by the President of the Republic, the bicameral legislature by the National Assembly and the Senate, then the judiciary through different jurisdictions, the highest of which is the Constitutional Court. This constitution also provides for the decentralisation of public management with the creation of regions, decentralised local authorities open democracy and liberalisation. The two official languages are French and English, and more than two hundred ethno linguistic groups coexist in the country (**6**).

Administratively, the country is made up of 10 Regions subdivided into 58 Divisions, 360 Sub divisions, 360 Municipalities and 14 Urban Councils. Decentralised local authorities are managed by legal public law entities freely administered by elected

councillors with conditions set by the Law. They enjoy financial and administrative autonomy for the management of regional and local interests **(7)**.

1.3. DEMOGRAPHIC SITUATION

Cameroon's population was approximately 24,253,757 inhabitants in 2017, over a surface area of 475,650 km2, representing 50 inhabitants per square kilometre. This population is predominantly young; people under 15 years of age represent 43% of the total population, and those aged 65 and above are 3.5%. The growth rate of this population is 2.6% on average per year and the birth rate is 22.5%. About half of the population lives in urban areas, including about 20% in the cities of Douala and Yaounde. Cameroon has 240 ethnic groups, divided into three large groups (Bantus, Semi-Bantus and Sudanese) **(4, 8).**

1.4. MACROECONOMIC SITUATION

In 2019, Cameroon developed its National Development Strategy-Cameroon 2030 which is based on the lessons learnt from the implementation of the Growth and Employment Strategy Paper (GESP) which take over until 2030. With a view to achieving the objectives of the 2035 vision which aims to make Cameroon 'an emerging country that is democratic and united in its diversity'. The latter places the average annual growth rate at about 5.6% over the2021–2030 period **(4,9).**

As for GDP growth, it accelerated in 2021 (3.5%) compared to 0.5% in 2020, thanks to the revival of non-petroleum activity and continued investments. The budget deficit narrowed to 3.1% of GDP in 2021 as compared to 3.3% in the previous two years, thanks to fiscal consolidation measures aimed at reducing expenditures and increasing non-petroleum budget revenues (10**).** Despite the global economic crisis, real GDP growth is expected to reach 4.6% by 2024.

The urbanisation rate, estimated to be 58%, higher than the average (41%)in sub-Saharan Africa in 2020, increases the challenges to be faced in terms of urban planning, pollution reduction and sustainable development. In response to these challenges, the national level determined contributions (NDC), submitted in October 2021, aims at reducing 35% emissions 2030.

CHAPTER II
SITUATION ANALYSIS OF AMR IN CAMEROON

2.1. BACKGROUND AND RATIONALE

2.1.1. INTRODUCTION

AMR is the ability of a micro-organism (bacteria, virus, parasite, fungus) to grow in the presence of an antimicrobial agent. It occurs when a micro-organism mutates such that drugs used to treat infections that are caused by these microbes become ineffective **(11)**. This phenomenon represents one of the most serious world threats today in human, animal, plant as well as environmental health. Described as a silent pandemic, it causes consequences including increased treatment duration, increased mortality and healthcare costs and repercussions on livelihoods and food security **(12)**.

According to a study carried out in 2022, 4.95 million people died worldwide in 2019 from diseases caused by antimicrobic resistance. From these 1.17 million people had a direct link with bacterial resistance in sub-Saharan Africa. In Africa, deaths attributable to antimicrobial resistance all ages included is greater than 27 deaths per 100000 inhabitants. (13)

45 member states (96% of the total region) have national action plans to combat antimicrobial resistance and 33 of them (76%) have been approved by national authorities. That said the implementation of national action plans is hampered by insufficient investments and human resource capacity, the poor links between health security and strategic health national action plans. In addition countries should rely on the regional strategy (13)

Globally, it is estimated that if no action is taken, AMR could lead to the death of approximately 4.15 million people each year by 2050 **(12)**. It is generally accepted that the inappropriate use of drugs and phytosanitary products, inadequate waste management and excessive consumption of antimicrobials in agriculture, human and veterinary medicine are the main factors favouring the occurrence of AMR. All these practices are at the origin of the presence of antimicrobials and/or their residues in foodstuffs and in the environment (waterways, soils and basements), thus significantly increasing the risk of the development of resistant microbial strains (12)

In developing countries, this is caused by the misuse of antimicrobials, characterised by a high tendency for self-medication and the existence of questionable supply chains. As a result, WHO has highlighted that antimicrobial resistance could compromise the achievement of Sustainable Development Goals (SDGs), affecting health security, poverty, economic growth and food security **(14).** The cumulative economic cost of AMR in terms of lost global production by 2050 would be US$100 billion if no action is taken. Low- middle-income countries would be most affected, and the increase of the inequality gap within countries is expected **(13)**.

In response to this African phenomenon, the African Union (AU) created an AMR work group in 2018, including all agencies involved in human, animal, plant and environmental health. The pan-African organisation targets thefollowing objectives for the 2020–2025 period: (i) advocate for policies, laws, good governance and capacity building to enable long-term prevention and control of AMR; (ii) involve civil society organisations; (iii) develop qualified human resources; (iv) improve awareness and understanding of antimicrobial resistance and promote the implementation of international standards; (v) strengthen knowledge through research **(15**The fight against this phenomenon therefore requires the 'One Health' approach, with combined efforts from the different sectors concerned.

Analysis of Cameroon's capacity to address global health threats using the Joint External Evaluation (JEE) tool of the IHR in 2017 revealed limited or non-existent capacities in the fight against AMR **(16)**. One of the priority recommendations was to develop a National Action Plan for the fight against AMR (NAP-AMR).

In 2018, Cameroon developed a National Action Plan for the fight against AMR (2018 - 2020) following the recommendations of the Global Plan on AMR **(17)**, with six strategic objectives. The situation analysis of AMR in Cameroon carried out in June 2022, revealed several intrinsic and extrinsic factors, which hinder the implementation of activities to combat AMR. These include, without being exhaustive, the lack of concerted funding dedicated to activities to combat AMR, both at the sectorial and multisectoral coordination level. Equally, the planned governance mechanism (Multi-sectoral Coordination Committee, Technical Secretariat, Technical Working Group) has not been put in place. However, several significant actions that contribute to the fight

against AMR have been implemented by the various sectors, with the support of technical and financial partners.

2.1.2. REGIONAL AND SUB-REGIONAL FACTORS

In the Sub-Saharan African Region, the real impact of AMR is still little known despite the existence of some studies reporting a high prevalence (**14, 18**). This is exacerbated by variations inexisting data on AMR. In its global report on antimicrobial resistance, WHO stated that Africa has one of the greatest gaps in data availability (**19**).

WHO recommends that countries in the above-mentioned region integrate AMR indicators into their strategy to fight this threat. However, a study by Elton et al. on the AMR section of the JEE reports for sub-Saharan Africa has shown that there are enormous disparities among countries, especially in regards to the level of implementation of the recommendations of the Global Action Plan on AMR, as shown in table1 (**20**).

Table I: AMR indicators present in the responses of Sub-Saharan African countries to the technical questions, 2020.

AMR Indicator	Total sub-Saharan African	West African countries (15)	Central African countries (7)	East African countries(17)	Southern African countries (5)
National action plan in place	11 (25%)	2 (13%)	1 (14%)	7 (41%)	1 (20%)
AMRhuman pathogens on	17 (39%)	3 (20%)	3 (43%)	9 (53%)	2 (40%)
AMR animal pathogens on	1 (2%)	0 (0%)	0 (0%)	1 (6%)	0 (0%)
AMR tests on human pathogens	29 (66%)	11 (73%)	3 (43%)	11 (65%)	4 (80%)
AMR tests on animal pathogens	11 (25%)	2 (13%)	0 (0%)	8 (47%)	1 (20%)
AMR tests carried out at the National Public Health Laboratory	27 (61%)	7 (47%)	6 (86%)	10 (59%)	4 (80%)
IPC training on prevention and control	11 (25%)	3 (20%)	2 (29%)	3 (18%)	3 (60%)
Sufficient WASH programmes in place	2 (5%)	0 (0%)	0 (0%)	2 (12%)	0 (0%)
Drug management framework	11 (25%)	3 (20%)	1 (14%)	5 (29%)	2 (40%)
Clinical antimicrobial legislation	19 (43%)	5 (33%)	2 (29%)	7 (41%)	5 (100%)

Veterinary antimicrobial legislation	14 (32%)	5 (33%)	2 (29%)	3 (18%)	4 (80%)

Source: Elton et al. (2020) (**18**)

According to the authors, only 11 out of the 44 countries in Sub-Saharan Africa had a NAP- AMR. In the specific case of the Central African sub-region, only one of the 7 countries in the sub-region had a NAP-AMR at the time this study was carried out. However, many other countries already have their NAP-AMR. Equally, two countries in the sub-region had legislation on drugs. With regard to the surveillance systems in place, the study reported that more than half did not yet have an AMR surveillance system, either in the human, animal, plant or environmental health sectors.

2.1.3. EPIDEMIOLOGICAL PROFILE

The epidemiological profile of Cameroon is characterised by a predominance of infectious diseases. They accounted for around 24% of the overall disease burden. HIV/AIDS, malaria and tuberculosis accounted for 11.48%, 10.77% and 1.41% respectively. These diseases are one of the main causes of mortality and morbidity in human and animal populations, and contribute to the widespread use of antimicrobials (**14, 21**). For example, the convincing results obtained from the management program of priority diseases (malaria, tuberculosis, HIV) are unfortunately often accompanied by the emergence and spread of antimicrobial-resistant germs (**9**).

The annual reports from the surveillance of AMR sentinel sites shows that the most isolated pathogens of priority in human health in 2021,2022 and 2023 are; *Escherichia coli, Klebsiella pneumoniae and Staphylococcus aureus* **(22)**. As concerns sustainable development objective indicators on blood infections *Escherichia coli isolates* presented high resistance to Aminopenicillins + Betalactamase inhibitors (Amoxicillin + clavulanic acid: 68.18%), they represent more than 50% resistance to fluoroquinolones (Ciprofloxacin: 67.44%, Levofloxacin: 53.12%) and more than 60% to 3rd generation cephalosporins (Ceftazidine: 60.87%, Ceftriaxone: 89.28%).

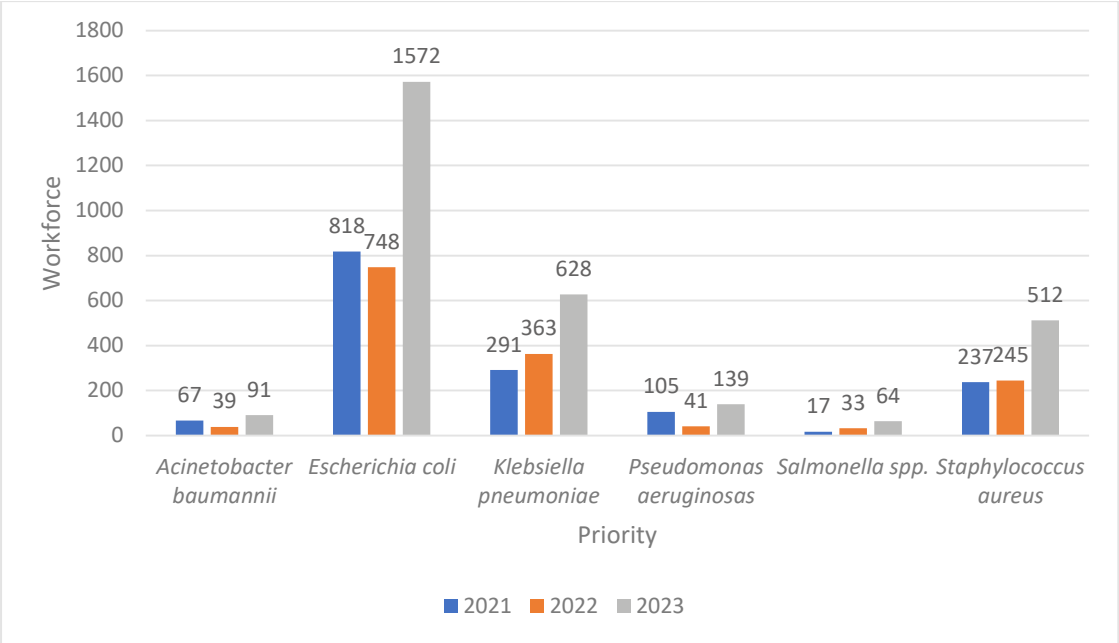

Figure 1: Annual AMR surveillance report 2023

The inappropriate use of antimicrobials in livestock and pets, the low vaccination coverage against most livestock diseases of priority and the poor application of biosecurity measures on farms all contribute to aggravating the phenomenon of AMR in the animal health sector **(23)**.

Poor farming practices, especially the irrational use of antimicrobials to combat plant diseases and pests, were highlighted.

Zoonoses are diseases that are transmitted from humans to animals and vice versa. Being of viral, bacterial or parasitic origin and are increasingly of interest in Cameroon, giving rise to increased use of antimicrobials.

2.2. INCIDENCE AND PREVALENCE OF AMR IN CAMEROUN

Severalstudies describing the AMR situation in Cameroon (20–23) show that AMR is growing rapidly. A systematic review and meta-analysis recently published from the 'One Health' perspective estimate antimicrobial resistance rates at 68.2% in human health, 13.6% in animal health and 18.2% in the environment (24). A total of 19 bacterial species were tested against 48 antibiotics, and multi drug resistance was observed in allthe antibiotic classes. *Escherichia coli*, *Klebsiella pneumoniae* and*Staphylococcus spp* in the human studies had multidrug resistance (MDR) rates of 47.1%, 51.0% and 45.2% respectively. *Salmonella spp* was identified in animal studies and revealed aMDR

rate of 46.2%, while *Staphylococcus spp* was identified in environmental studies with a MDR rate of 67.1% (**25**). The Multi-resistant species found in the human , animal and environmental health sectors by the various studies were *Staphylococcus spp. Proteus spp. and Citrobacter spp. Proteus spp., Citrobacter Serratia fonticola, Aeromonas hydrophila* and *Kluyvera spp*. were also reported in aquaculture **(14, 26**.

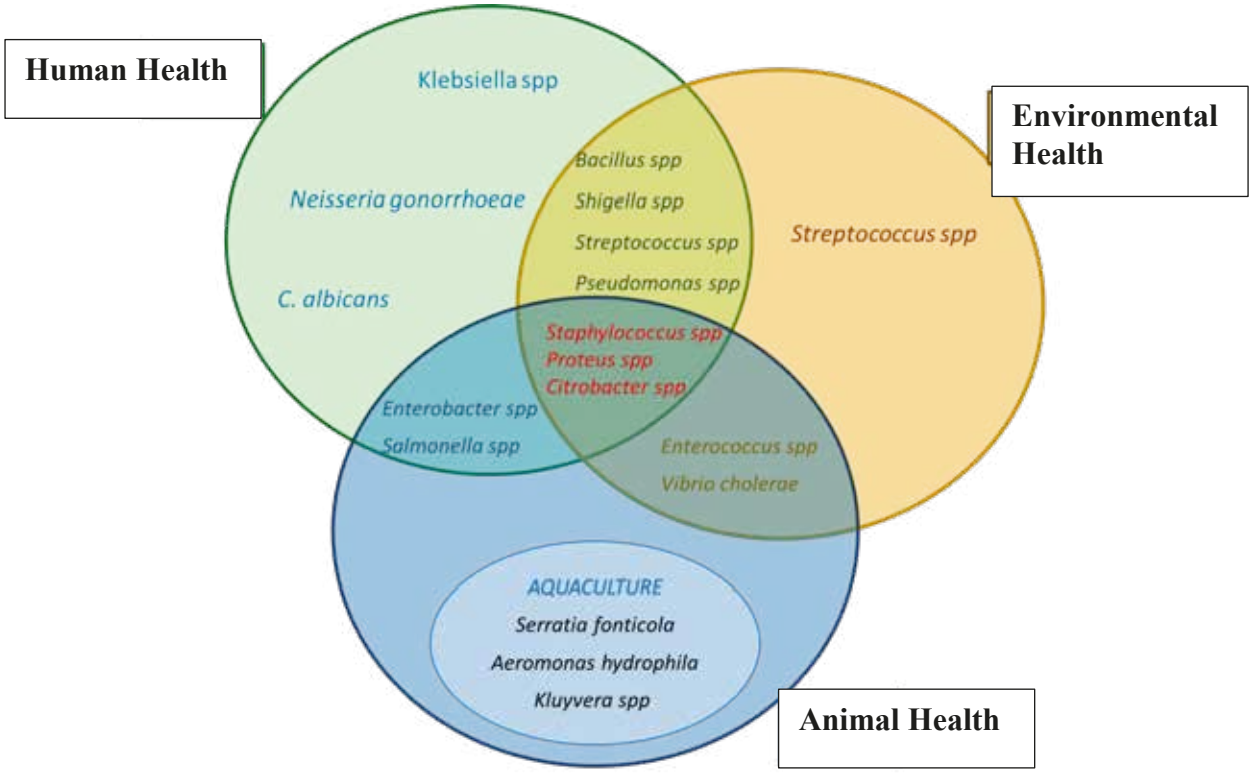

Figure 2: *Distribution of resistant species in the different health sectors*

Source : *Tiabou et al. (2019) ; Kesah et al. (2020); Mohamadou et al. (2020); Mouiche et al. (2020) ; Lyonga Mbamyah et al. (2020); Djim-Adjim-Ngana et al. (2020); Ngogang et al. (2021); Mouiche et al. (2022)*

In the aquacultural sector, the practice of integrated fish farming and the use of locally manufactured feed and farm animal waste is a major risk for the spread of germs in the fish pond. A recent study carried out in Mfou, in the Centre Region of Cameroon, revealed heavy contamination of fishponds, with microbial loads exceeding recommended limits. The germs found in the fish skin isolates included *S. aureus*, *Enterobacter sakazakii, Citrobacter freundii, Serratia fonticola, Klebsiella oxytoca, Proteus* spp. *Aeromonas hydrophila, Kluyvera spp., Moraxella spp., Pasteurella multocida* and *Pseudomonas fluorescens*, all being multi-drug resistant with a multiple resistance index to antibiotics including penicillin G, chloramphenicol,

sulfamethoxazole/trimethoprim, erythromycin and tetracycline (**27**). This data raises concerns about the risk posed by fish ponds as sources of zoonotic pathogens.

Other studies targeting slaughterhouses revealed several bacterial pathogens in waste and waste waters, most of which were resistant to commonly used antimicrobials.

The majority of these pathogens, including *E. coli*, *Salmonella spp*. *Shigella spp*. et *S. aureus*, were multi-resistant (**25, 28**). These pathogens were released into the environment and nearby water channels as a result of poor hygiene and sanitation practices. Findings from this study add to the growing evidence that slaughterhouses are a substantial link in the spread of antimicrobial resistance.

2.3. LEGAL AND INSTITUTIONAL FRAMEWORK FOR AMR CONTROL

Cameroon has ratified several international legal bodies (conventions, treaties and agreements) and has a number of legal and regulatory texts governing the quality, safety and efficacy of drugs for human and veterinary use, as well as phytosanitary and chemical products. However, there are no specific laws and regulations which provide a framework that brings together in a spirit of synergy and complementarity, the actions of the various ministries involved in AMR control (**27, 29**).

2.3.1. Human health

In the human health sector, there are no specific regulations relative to the fight against AMR. However, the interpretation of certain legal instruments provides a basis for interventions in this area. Decree No. 2013/093 of April 3, 2013 organizing the Ministry of Public Health confers missions to combat AMR to certain Inspectorates and Directorates, in particular

- General Inspection of Pharmaceutical Services and Laboratories: The inspection of institutions selling or dispensing antimicrobials is a crucial activity for the control of sales practices. However, the latter is done sporadically due to lack of adequate logistical, material and financial resources. In the hospital environment, infectious problems linked to AMR are frequent and can be explained, among other things, by the inadequacy of surveillance and prevention activities for infections associated with care; misuse of antimicrobials (inappropriate prescriptions); lack of good hygiene practices in hospitals; the

existence of illicit drug distribution circuits throughout the national territory, which exacerbates the phenomenon of self-medication .

- Directorate of Pharmacy, Medicines and Laboratories (DPML): It is the structure of the MINPH responsible for the organization and coordination of regulatory activities in the pharmaceutical sector and laboratories. It works in collaboration with the General Inspection of Pharmaceutical and Laboratory Services (IGSPL).
- Directorate for the Fight against Disease, Epidemics and Pandemics (DLMEP) which is responsible in particular for: developing prevention strategies against epidemics and pandemics, and monitoring their implementation; the development of strategies to combat epidemics and pandemics, and the monitoring of their implementation; the coordination of epidemiological surveillance; cross-border health surveillance.
- Division of Operational Research in Health (DROS): the DROS's mission is to promote health research, particularly in maternal and child health, the fight against disease and nutrition. It also has a role in monitoring issues related to bioethics, research on medicinal plants and the popularization of research results.
- LANACOME: which in favor of Decree No. 2018/764 of December 11, 2018 reorganizing the National Laboratory for Quality Control of Medicines and Expertise, has the mission of ensuring the control of the quality of medicines and other pharmaceutical health products as defined by current regulations.
- NPHL: which in favor of decree n°2964/MINPH of October 9, 2015 relating to the creation, organization and operation of the National Public Health Laboratory, under the coordination of the DPML, gives it the missions of: carrying out health diagnostic activities, public and quality control; to provide technical support for epidemiological surveillance, in collaboration with the Directorate in charge of the Fight against Disease, Epidemics and Pandemics (DLMEP) and the National Public Health Observatory (ONSP); and to contribute to the development of the activities of Public Health laboratories on the national territory **(30)** .

Some policy documents dealing with the fight against AMR can also be cited. These are:

- From the National Guide for Infection Prevention and Control in health facilities in Cameroon, developed in January 2021, the general objective of which is to improve IPC practices as well as the quality of care in health facilities in Cameroon.
- From the National Guide for biosafety and biosecurity in laboratories in Cameroon, adopted on June 25, 2019, the objectives of which are: to align laboratory practices with the standards and new guidelines of the WHO and the OIE in terms of biosafety ; to provide information relating to the safe handling, transport and elimination of materials and organisms presenting biological risks; to harmonize laboratory practices nationally.

Standardized protocols for the prevention, diagnosis and treatment of infectious diseases are not always available to ensure adequate case management. However, treatment algorithms for priority diseases (HIV/AIDS, tuberculosis, malaria, etc.) are available and regularly updated.

Furthermore, as part of the surveillance of the pharmaceutical market and the supply chain, quality control of imported batches is not systematic and only a small proportion of circulating batches is controlled post-marketing. However, guides to good pharmacovigilance practices and texts on the organization of pharmacovigilance have been developed and validated and awaiting signature. Exploiting the results of the various surveillance activities at sentinel sites would make it possible to document the revision of protocols and therapeutic algorithms in the different sectors.

2.3.2. Animal Health

There is a national regulatory framework that covers the industry, importation, marketing authorisation (MA) and quality control of drugs and other products for veterinary use. There is equally a compendium of texts governing livestock farming, fisheries and animal industries As part of the livestock development project (PRODEL), a Management Plan for Antiparasitics and Antimicrobials (PG2A)' was equally developed and disseminated in 2017.

Law No. 2000/018 of 19th December 2000 governing veterinary pharmacy covers aspects relating to marketing authorisation, importation, industrial preparation, wholesale, sale and retail distribution. Furthermore, Decree No. 2012/382 of September

14 th , 2012 organizing the Ministry of Livestock, Fisheries and Animal Industries confers missions to combat AMR to certain Directorates of MINEPIA in particular, **that of Veterinary Services , Fisheries and its industries, Aquaculture, Development of Animal Production and Industries,** Pastures, Animal Feed and Livestock Infrastructure. Decree No. 2008/2009 of 8th December 2008 to lay down the conditions for the manufacturing, packaging, importing, wholesale and retail distribution of veterinary drugs and Order No. 178 CAB/PM of 5 December 2008 to set up, organise and lay down the functioning of the Commission in charge of reviewing applications for the marketing authorisation of veterinary drugs. These instruments are also found in a compendium of texts on livestock farming, fishiries and animal industries.

With regard to the use of antimicrobials, a route mapping and marketingflow of the use, sale and disposal of antimicrobials for food-producing animals was partially done. There is a regulatory framework for the distribution of veterinary drugs. However, there is no specific regulatory framework to prevent the use of antimicrobials of critical importance. There is also a 2021–2023 multi-sectoral action plan for the sound management of antimicrobials in Cameroon, but aquaculture is not represented. The effective implementation of related activities will help to improve AMR control through the reporting of resistance and treatment failures by health professionals.

Activities for control are carried out by the Veterinary Services Department (VSD) and its branches at the decentralised level. The Veterinary Association is involved in the inspection of pharmaceutical facilities.

2.3.3. Plant Health

There are international conventions, legislative and regulatory texts, protocols, directives as well as a FAO code of conduct which govern the use of antimicrobials in the plant health field. The approval, importation, distribution, use of pesticides, elimination of empty packaging and obsolete pesticides are also regulated. The provisions of Law No. 2003/003 of April 21st , 2003 on phytosanitary protection which is currently being revised and its implementing decrees make it possible to ensure the quality, safety and effectiveness of pesticides with the aim of preserving human, animal and environmental health (33, 34, 35) .

Decree No. 2005/118 of April 15th, 2005 organizing the Ministry of Agriculture and Rural Development confers some missions to the MINADER directorate for the fight against AMR, in particular:

- The directorate of Agricultural Development: carries out activities related to good agricultural practices;
- The directorate of Regulation and Quality Control of Agricultural Inputs and Products: responsible for developing regulations, inspection and quality control of agricultural inputs and products.

However, the lack of financial and human resources constitutes an obstacle to the development of the above-mentioned activities.

Furthermore, the proliferation of phytosanitary institutions importing and distributing unapproved pesticides, counterfeiting, lack of mastery of good phytosanitary practices, and non-compliance with ethics by those involved in the sector constitute obstacles for the good use of phytosanitary products.

Regarding the practices of conservation, prescription, dispensation and use of antimicrobial agents, some documents or guides have been produced such as the control and inspection procedure manual for agricultural inputs and products, the user manual for devices phytosanitary treatments and a guide to good pesticide management.

There is a joint MINADER/MINEPDED project entitled "Elimination of POPs, obsolete pesticides and strengthening of the rational management of pesticides in Cameroon", which aims to mitigate the risks layed by pesticides, expired pesticides, empty pesticide packaging to public health and the environment.

2.3.4. Environmental health

In environmental health, there is a great variety of legal instruments. These include international conventions and treaties duly ratified by Cameroon, laws and regulations especially in the areas of environmental assessments. They equally highlight aspects that deal with waste management, biotechnological risks, harmful and/or dangerous chemical substances and the protection of the environment (air, water, soil and subsoil) against all forms of degradation. Equally Environmental and Social Management Plan (ESMPs) follow up activities, environmental inspections and controls are being organised in classified institutions to monitor environmental compliance, on the one

hand, and pollution, rational ecological waste management and compliance with environmental standards in terms of sanitation and establishment, on the other hand. Decree No. 2012/431 of October 1st 2012 organizing the Ministry of the Environment, Nature Protection and Sustainable Development confers missions for the fight against AMR to the Directorate for the Promotion of Sustainable Development .

However, challenges remain, including the insufficient programming of inspections and environmental control of agricultural producing institutions, fisheries, aquaculture, livestock and health facilities whose activities are potential sources for the emergence and spread of AMR in the environment Poor disposal practices for expired and/or counterfeit antimicrobials (including antibiotics, antifungals and antiparasitic agents) and poor monitoring of sewage waste are also significant factors. The above mentioned aspects are all important and deserve particular attention in the formulation of actions to combat AMR in the environmental sector.

A number of standard documents have also been developed, including standards for wastewater discharge, air emissions and landfill development. Most of these standards recommend the best options for treating solid waste, liquid and gaseous effluents in order to ensure a healthy environment. However, these standards are not always respected in classified institutions.

2.4. GOVERNANCE AND MULTI-SECTORAL COORDINATION IN THE FIGHT AGAINST AMR IN CAMEROON

Given the AMR complex aetiology and determining factors, on the one hand, and its multifaceted impacts on the other hand, this phenomenon requires a multi-sectoral response (36). Cameroon adopted the 'One Health' approach as part of the development and implementation of the first National Action Plan for the fight against Antimicrobial Resistance (11)AMR focal points have been officially designated and trained in the four key sector ministries (MINPH,MINEPIA, MINADER, MINEPDED,).

It is important to mention that despite all the efforts made, Cameroon does not have a formal institutional framework for the coordination of activities to combat AMR. These activities are carried out under the leadership of the MINPH through the National Public Health Laboratory.

2.5. FINANCIAL ANTIMICROBIAL RESISTANCE CONTROL ACTIVITIES IN CAMEROON

Difficulties have been noted in resource mobilisation for the sustainable financing of AMR activities. Generally, there is no specific budget line dedicated for activities to combat AMR at the sectoral level. However, PNPLZER has a budget line planned for AMR activities in its yearly work plan. Some AMR activities are carried out in the various sectors. The significant actions conducted as part of AMR control are generally supported by technical and financial partners.

. It would be wise to carry out advocacy at the strategic level, in order to mobilize the necessary resources at each sectoral level for the implementation of the various activities planned in the NAP-AMR.

2.6. SURVEILLANCE ACTIVITIES

As part of AMR surveillance activities, an integrated sentinel surveillance system for priority antimicrobial agents in Cameroon has been set up, through: the development and dissemination of human and animal health SOPs for AMR surveillance; the development and validation of an integrated AMR national surveillance guide in January 2021; the operationalization of 17 sentinel sites in 06 regions, namely the Centre, Littoral, South-West, Adamawa, North and West Regions.

As part of the MAAP Project (Mapping *AMR and AMU Partnership)*, data on the use of antimicrobials was collected retrospectively (from 2017 to 2019) in certain pharmacies in the cities of Yaounde, Douala, Buea, Limbe, Maroua, and Ebolowa in 2021. On the other hand, an AMR sentinel surveillance system has been set up in human and animal health, with 17 sentinel sites identified in 6 regions of Cameroon. The data from this monitoring is transmitted monthly to the NPHL (which coordinates it) by the focal points of the different sites. This data is assembled, analyzed and transmitted to DLMEP and partners.

In animal health, with regard to prescription practices, the situation remains critical since prescriptions in most veterinary clinics are essentially made on the basis of symptomatic diagnosis. An evaluation of the antibiotic consumption trend for veterinary use in livestock was carried out in Cameroon from 2014 to 2019. It emerged that 217.67 tons of antibiotics (by weight of active substance) was imported during this 6-year

period with an average of 36.28 tons per year. Tetracyclines (31.71%), sulfonamides (23.84%), quinolones (11.11%), and β -lactams (10.17%) were the most imported classes (**31**). Another recently published study on 70 modern laying poultry farms and 4 veterinary pharmacies in the West region of Cameroon reveals excessive use of antibiotics; tetracycline, sulfonamides, quinolones and β -lactams (aminopenicillins) being the most sold and used in hen laying farms (**32**). It is important to note that 78.2% of the antibiotics sold in these pharmacies and 67.3% used in livestock belong to the critically important antimicrobial class. Concerning the dosage adequacy, aminoglycosides (100%), macrolides (90.6%), and tetracycline's (74.5%) were the most underdosed, while the sulfonamides trimethoprim (45.8%) and beta-lactams (35.7%) were overdosed. This study highlights the irrational use of antimicrobials in poultry laying farms. These include doxycycline, sulfonamides, ampicillin and streptomycin.

Regarding the aquaculture sector in particular, it is important to mention that in Cameroon, the production system is experiencing gradual improvement with the use of quality inputs. This change requires that greater attention be paid to fish diseases and the rational use of antimicrobials in aquaculture. However, there is little control over the use of antibiotics in aquaculture in Cameroon, aquaculturists can easily obtain them in any veterinary pharmacy and the dosage may therefore not be respected. The main antibiotics commonly used in aquaculture are oxytetracycline (OTC), levofloxacin and enrofloxacin.

In Plant Health, there is a list of plant pests that allows for surveillance at the country's points of entry. Surveillance documents for plant pathogens are not yet available.

In environmental health, environmental inspections and controls are carried out in institutions classified by MINEPDED in collaboration with certain sectoral administrations, notably MINMIDT and MINEE. But these pay little attention to antimicrobial pollution as well as resistant germs in the different environments.

Despite the progress made, no multi-sectoral platform for reflection on mechanisms for detection, notification, analysis and sharing of information on AMR has been established as planned in the NAP-AMR 2018-2020. Equally, there is no multisectoral

mechanism for systematic collection and processing of data on the use of antimicrobials in Cameroon.

2.7. LABORATORY CAPACITIES

The national laboratory system comprises laboratories in human, animal, plant , environmental health and research. An assessment of the national AMR surveillance in the food and agricultural sectors wasconducted using the FAO/ATLASS (Assessment Tools Laboratories Antimicrobial Surveillance System) tool in December 2021, in the NPHL, LNAD, LANACOME,, , CPC andLANAVET laboratories in Garoua and Yaounde. Of the six laboratories assessed, two were classified at level I (good bacteriological detection capacity), two at level II (good detection capacity, first participation in EILAS) and two at level III (good bacteriological and AMR detection capacity, regular participation in EILAS). LNAD is the only laboratory that carries out tests for pesticide residues in foodstuffs.

It should also be noted that MINEPDED does not own an analysis laboratory and therefore carries out its detection activities through existing approved laboratories (Centre Pasteur Cameroon, HYDRAC etc…) and also through specialised university laboratories with whom collaboration agreements have been signed. These include the ENSAI laboratory for physicochemical analysis at the University of Ngaoundere, the Nkolbisson Biotechnology Centre of the Yaounde 1 University and the Biotechnology Unit of the University of Buéa for the detection of Genetically Modified Organisms (GMOs) at the country's entry points. These laboratories have also been provided with equipment and consumables.

Though these laboratories are involved in the detection of pathogens and AMR surveillance, they unfortunately do not operate as a network and some have basic technical platforms. The technical level of MINADER and MINEPIA laboratories in analysing antimicrobial residues have been substantially improved in recent years. For instance, MINADER, National Laboratory for Diagnostic Analysis of Agricultural Products and Inputs (NLAD) carries out conformity analysis of pesticide samples for quality control purposes for imports and residue detection. It carries out studies on consumer products (vegetables, plantain, etc.). LANAVET, the MINEPIA laboratory, carries out sporadic search for residues in meat, eggs, milk and fish.

Laboratories in Cameroon use international standards (ISO/IEC 9001- Quality Management; ISO/IEC 15,189- Quality and Competence Requirements for Medical Analysis Laboratories; ISO/IEC 17,025- Calibration and Testing Laboratories; ISO/IEC 14,001-Environmental Management). Some are accredited, including CPC (ISO/IEC 15,189 and ISO/IEC 17,025) the Limbe and Buea Regional Hospital laboratories(ISO/IEC 15,189).

2.8. COMMUNICATION ON AMR

Improving the knowledge, attitudes and practices of the population and service providers in order to combat AMR effectively remains an undeniable priority. Communication on AMR is highly dependent on funding for the implementation of activities included in the NAP-AMR. The following activities have been carried out to raise awareness and provide fact-based information on AMR:

- KAP surveys on small-scale AMR in the animal sector. This study did not cover the scope of the most common conditions responsible for increased use of antimicrobials;
- Four editions of Global Antimicrobial Awareness Week have been organised since 2018, except in 2019.

These activities were targeting human, animal, plant and environmental health professionals, and the community. In animal health, awareness-raising activities were carried out in the North, Littoral and Centre Regions for the professionals and producers of poultry, pigs, cattle and small ruminants. In the South-West Region in Buea, a small-scale awareness-raising workshop for producers on the use of antibiotics as growth drivers in livestock farming was also held in 2020. In human health, awareness-raising activities in communities and hospitals (health professionals) on the use of antimicrobials are regularly organised as part of routine activities. Centre Pasteur Cameroon has organised special days in 2021 to raise awareness on AMR. In addition, a draft strategic communication plan for AMR control has been drawn up and is awaiting finalisation and validation. In the environmental sector, apart from the activities organised during the World Antimicrobial Awareness Week, no real awareness-raising activities have been carried out for the various stakeholders (communities, agricultural and fisheries producers, hospitals, environmental license

holders) on open defecation, antimicrobial drug waste management (including pesticides), biosafety, sanitation, hygiene and infection prevention measures.

2.9. TRAINNING ON AMR IN VARIOUS FIELDS

Many training programs have been organised as part of continuity ofuniversity education.

With regard to university training on AMR, a Master's programme on AMR has been running at the Faculty of Health Sciences at the University of Buea since October 2022. Other short on-line courses on different aspects of AMR (surveillance, diagnosis and antimicrobial management) are planned in the same institution, with support from (USAID, IDDS, MTapS and AFROHUN). The University of Douala also provides optional modules on AMR in its Masters Programme in Clinical Biology in the Faculty of Medicine and Pharmaceutical Sciences.

As for continuing education, a 6-month training program was started in 2018 by Cameroon universities (University of Dschang, University of Buea), with support from partners (USAID, AFROHUN). This program, building on the 'One Health' approach, is targeting human, animal and environmental health professionals, and in 2019 it helped to build the capacity of 21 people.

Besides, there are specific projects such as the QWArS Project (Qualifying the Workforce for AMR Surveillance in Africa and Asia), which is a 7-month continuing education programme on AMR. A first batch of 18 professionals (epidemiologists and laboratory staff) from the human and animal health sectors were trained as trainers in AMR surveillance.

MINADER, through the Agricultural Development Department (ADD), has developed training modules and organises annual training sessions for producers (cocoa and vegetables) on good agricultural practices, including the use of pesticides. An average of 400 pesticide producers and distributors are trained each year. It should be noted that these training courses do not cover all aspects of AMR.

2.10. IPC IN CAMEROON

A national IPC plan (only for human health) was validated in February 2022. IPC committees were set up in some health facilities in the country following a circular

letter signed by the Minister of Public Health. The IPC committee set up is on-going in other health facilities. There is equally a national guide for the management of biomedical waste in human health developed in 2019 but not validated and a standard operating procedure manual for waste management in the public health emergencies contextvalidated in June 2022.

Close to 1,000 human health personnel were trained in IPC during the COVID-19 pandemic outbreak, guidelines relating to IPC were developed and disseminated for stakeholders at the operational level. A national guide for IPC in health facilities was developed in 2020 but not disseminated yet at the operational level.

In animal health, biosafety and biosecurity guides were developed and training/awareness activities are regularly organised by MINEPIA through RESCAM. Awareness-raising campaigns and use of veterinary drugs are regularly organised for breeders. In case of an epizootic, these campaigns are accompanied by biosecurity awareness sessions

Regarding waste management, the national waste management strategy is outdated and requires revision. However, in human health, a national waste management guide in hospitals was developed, validated and distributed in 2019

CHAPTER III
STRATEGIC FRAMEWORK

One of the objectives of the National Development Strategy for 2030 (SND30) is to improve the living conditions of populations and their access to basic social services by ensuring a significant reduction of poverty and underemployment. . The SSS 2020 - 2030 also reaffirms the Government's desire to continue the pursuit of the Sustainable Development Goals (SDGs) as a whole.

3.1. VISION

To make Cameroon a nation where human, animal, plant and environmental health are preserved through a responsible use of quality antimicrobials in order to slow down the appearance of resistant germs and prevent their spread to other sites or places by 2035.

3.2 GUIDELINES

- **Mobilizing the entire society under the One Health approach: All sectors and disciplines, including civil society and the private sector, should participate in the implementation of the regional health strategy to combat antimicrobial resistance.**
- **Member State ownership and leadership: The fight against antimicrobial resistance is primarily the responsibility of governments. Member States should make political commitments and accountability at all levels of the health system, while mobilizing funds at the national level and encouraging other stakeholders to invest in combating antimicrobial resistance.**
- **Access: The population should have access to antimicrobials when in need and the misuse of antimicrobials should be limited.**
- **Social determinants of health, including gender equity and human rights perspectives: Stakeholders understand how inequalities based on gender, equity and disability fuel resistance to antimicrobials and are influenced by this antimicrobial resistance, including among others, the most vulnerable populations.**

3.3. GOAL

Reduce morbidity, mortality, disability and socio-economic harm linked to antimicrobial resistance by implementing a sustainable national action plan at the national level in order to combat antimicrobial resistance.

3.4. OBJECTIVES

3.4.1. General objective

Effectively combat antimicrobial resistance by using safe, effective, available and quality-assured drugs/pesticides, used responsibly according to the "*One Health*" concept.

3.4.2. Strategic objectives

Five strategic objectives, each with priority actions, have been defined in accordance with the Global Action Plan on Antimicrobial Resistance. These are:

1. ***Improve awareness and understanding of antimicrobial resistance through effective communication, education and training:***
   - Communication on AMR;
   - Education and training of actors involved in AMR control in all sectors.
2. ***Strengthen knowledge and evidence through surveillance and research:***
   - AMR surveillance and research;
   - Laboratory capacity.
3. ***Reduce the incidence of infections by implementing effective sanitation, hygiene and infection prevention measures:***
   - Strengthening multi-sector IPC/Biosafety at all levels
   - Strengthening the waste management system.
4. ***Optimise the use of existing antimicrobials in human, animal and plant health:***
   - Improvement of the regulatory framework for antimicrobials and phytosanitary products;

- Implementation of practices for the conservation, prescription, dispensing and use of antimicrobial agents.

5. ***Improve the management process and governance in the administrations involved in the fight against AMR by strengthening standardisation, monitoring/evaluation, regulation and accountability:***
   - *Assurance of an effective management process.*

CHAPTER IV

LOGICAL FRAMEWORK AND BUDGET

To achieve the strategic objectives set in the NAP-AMR, priority actions and activities will be implemented according to the schedule in the table below. This table also specifies the various implementing stakeholders as well as the financial resources to be deployed for the implementation of the planned activities

Table II: Logical framework and budget

STRATEGIC OBJECTIVE I: Improve awareness and understanding of antimicrobial resistance through effective communication, education and training										
PRIORITY ACTIONS	**OBJECTIVES**	**ACTIVITY**	**SUB-ACTIVITY**	**STRUCTURES IN CHARGE**	**COSTS**	**TIMELINE**				
						2024	**2025**	**2026**	**2027**	**2028**
1.1 Communication on AMR	1.1.1 Improve knowledge, attitudes and practices of populations including service providers to effectively combat AMR	1.1.1.1 Assess the level of knowledge, attitudes and practices (KAP studies) on AMR among human, animal, plant and environmental health professionals	Conduct a KAP study per sector on AMR among human, animal, plant and environmental health professionals	MINPH MINEPIA MINADER MINEPDED MINESUP MINRESI CSOs/TFPs	46,500,000	X	X			
			Organise a multi-sectoral meeting to present the results of the KAP study to the stakeholders involved in the fight against AMR	MINPH MINEPIA MINADER MINEPDED MINESUP MINRESI CSOs/TFPs	3,500,000		X			
		1.1.1.2 Finalize, validate and produce the communication plan according to the 'One Health' approach for the fight against AMR	Organise a workshop to finalise the communication plan according to the 'One Health' approach for the fight against AMR	MINPH MINEPIA MINADER MINEPDED MINESUP MINRESI CSOs/TFPs	12,000,000	X	X			
			Organise a workshop to validate the communication plan according to the 'One Health'	MINPH MINEPIA MINADER MINEPDED MINESUP MINRESI	9,000,000		X			

			approach for the fight against AMR	CSOs/TFPs						
			Produce 250 copies and disseminate the communication plan according to the 'One Health' approach for the fight against AMR	MINPH MINEPIA MINADER MINEPDED MINESUP MINRESI CSOs/TFPs	3,000,000		X	X		
		1.1.1.3 Build communication capacities on AMR according to the 'One Health' approach	Develop communication tools on AMR using the 'One Health' approach	MINPH MINEPIA MINADER MINEPDED MINESUP MINRESI CSOs/TFPs	12,000,000		X			
			Produce and disseminate communication tools on AMR according to the 'One Health' approach	MINPH MINEPIA MINADER MINEPDED MINESUP MINRESI CSOs/TFPs	12,000,000		X	X	X	X
			Organise 09 capacity-building sessions for central and regional focal points and 400 actors from decentralised services involved in the fight against AMR, communication on AMR in the human, animal, plant and environmental health sectors	MINPH MINEPIA MINADER MINEPDED MINSUP MINRESI CSOs/TFPs	120,000,000	X	X	X	X	X

		1.1.1.4 Carry out awareness-raising actions on AMR	Conduct 04 annual awareness sessions on the importance of AMR in regional and private veterinary clinics, HTCs, with agricultural, livestock and fish farmers, holders of environmental waste management licenses (garbage collectors), managers of waste water treatment plants, social housing managers	MINPH MINEPIA MINADER MINEPDED MINSUP MINRESI MINCOM CSOs/TFPs	53,000,000		X	X	X	X
			Organise a national multi-sectoral awareness campaign on AMR every two years through the media	MINPH MINEPIA MINADER MINEPDED MINSUP MINRESI MINCOM CSOs/TFPs	80,000,000		X		X	
		1.1.1.5 Promote communication on AMR	Annually organise the world week for the proper use of antimicrobials throughout the country	MINPH MINEPIA MINADER MINEPDED MINSUP MINRESI MINCOM CSOs/TFPs	120,000,000	X	X	X	X	X

			Organise a national forum on the control of AMR	MINPH MINEPIA MINADER MINEPDED MINSUP MINRESI MINCOM CSOs/TFPs	60,000,000			X		
			Annually participate in at least one national scientific event (symposium, conferences, forums, etc.)	MINPH MINEPIA MINADER MINEPDED CSOs/TFPs	40,000,000		X	X	X	X
1.2 Education and training of actors involved in the fight against AMR in all sectors	1.2.1 Build stakeholders' capacity and skills on AMR	1.2.1. 1. Integrate AMR modules into university training curricula.	Organise 02 multi-sectoral advocacy meetings, in accordance with the 'One Health' approach, with persons in charge of university education and sector-based vocational and para-professional trainings, with a view to integrating AMR modules into training curricula.	MINPH MINEPIA MINADER MINEPDED MINESUP CSOs/TFPs	6,000,000		X		X	
		1.2.1.2 Build stakeholders capacity and skills on AMR	Draw up a map of continuous training curricula on AMR according to themes	CCM MINPH MINEPIA MINADER MINEPDED MINESUP TFPs	2,500,000	X				

			Organise 2 harmonisation sessions of the continuous training curricula on AMR with all stakeholders	CCM MINPH MINEPIA MINADER MINEPDED MINESUP TFPs	24,000,000		X			
			Validate the harmonised continuous training curriculum on AMR	CCM MINPH MINEPIA MINADER MINEPDED MINESUP TFPs	9,000,000		X			
			Develop and train a group of 100 trainers on AMR according to themes	CCM MINPH MINEPIA MINADER MINEPDED MINESUP TFPs	33,000,000		X		X	
			Organise capacity-building sessions on specific themes for central and decentralised level stakeholders involved in the fight against AMR in the 10 regions of the country	MINPH MINEPIA MINADER MINEPDED TFPs	120,000,000		X	X	X	X
	TOTAL									**796,500,000**

STRATEGIC OBJECTIVE II: Strengthen knowledge and evidence-base through surveillance and research										
PRIORITY ACTIONS	**OBJECTIVES**	**ACTIVITY**	**SUB-ACTIVITY**	**STRUCTURES IN CHARGE**	**COST (FCFA)**	**TIMELINE**				
						2024	**2025**	**2026**	**2027**	**2028**
2.1. Surveillance and research on AMR	2.1.1 Improve knowledge and detection capacity of antimicrobial resistance cases and response in all sectors	2.1.1.1 Strengthen the capacities of actors at all levels of the key sectors involved in the fight against AMR, on SOPs for surveillance of infections caused by antimicrobial resistant pathogens.	Organise in every sector 1 workshop to develop/update the Standard Operating Procedures (SOPs) manual that has integrated aspects to combat infections caused by antimicrobial resistant pathogens.	MINPH MINEPIA MINADER MINEPDED TFP	24,000,000	X	X			
			Produce 500 copies and disseminate the Standard Operating Procedures (SOPs) manual that has integrated aspects to combat AMR, for surveillance of infections caused by antimicrobial resistant pathogens per sector.	MINPH MINEPIA MINADER MINEPDED TFP	10,000,000		X	X		

			Organise a training on SOPs for surveillance of infections caused by antimicrobial resistant pathogens for 100 key actors in the fight against AMR	MINPH MINEPIA MINADER MINEPDED TFPs	33,000,000			X	X	X
		2.1.1.2 Develop, validate and produce a SOP manual on AMR surveillance in environmental health	Organise a workshop to develop the SOPs manual on AMR surveillance in environmental health	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000		X			
			Organise a workshop to validate the SOPs manual on AMR surveillance in environmental health	MINPH MINEPIA MINADER MINEPDED TFPs	9,000,000		X			
			Produce and disseminate 100 copies of the SOPs manual on AMR surveillance in environmental health	MINPH MINEPIA MINADER MINEPDED TFPs	2,000,000			X	X	

		2.1.1.3 Develop, validate and produce a SOP manual for surveillance of plant pests and plant products for AMR in plant health	Organise a workshop to validate the list of plant pests for AMR surveillance in plant health	MINPH MINEPIA MINADER MINEPDED TFPs	9,000,000			X		
			Organise a workshop to develop the SOPs manual on surveillance of AMR plant pests and plant products in plant health	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000			X		
			Organise a workshop to validate the SOPs manual for surveillance of AMR plant pests and plant products in plant health	MINPH MINEPIA MINADER MINEPDED TFPs	9,000,000			X		
			Organise a review and validation workshop of the National Guide for AMR Integrated Surveillance, incorporating aspects relating to fish production in animal and plant health.	MINPH MINEPIA MINADER MINEPDED TFPs	2,000,000			X		

		2.1.1.4 Review and produce the National Guide for AMR Integrated Surveillance, incorporating aspects relating to fish production in animal and plant health.	Produce and disseminate 250 copies of the National Guide for AMR Integrated Surveillance	MINPH MINEPIA MINADER MINEPDED TFPs	21,000,000		X			
			Produce and disseminate 250 copies of the National Guide for AMR Integrated Surveillance	MINPH MINEPIA MINADER MINEPDED TFPs	3,500,000		X	X		
		2.1.1.5 Share information on AMR surveillance data	Extend the pool of AMR surveillance sites to other regions (East, Far North, South and North West) and other sectors	MINPH MINEPIA MINADER MINEPDED TFPs	75,000,000	X	X	X	X	
			Strengthen the capacities of the sentinel site actors on AMR surveillance in every key sector	MINPH MINEPIA MINADER MINEPDED TFPs	36,000,000		X	X	X	
			Draw up and produce biannual reports on AMR surveillance and annual reports for GLASS	MINPH MINEPIA MINADER MINEPDED TFPs	25,000,000	X	X	X	X	X

		2.1.1.6 Follow-up and evaluate AMR surveillance activities	Organise biannual monitoring and evaluation meetings on AMR surveillance	MINPH MINEPIA MINADER MINEPDED TFPs	45,000,000	X	X	X	X	X
			Carry out biannual supervision activities of AMR sentinel surveillance sites	MINPH MINEPIA MINADER MINEPDED TFPs	35,000,000	X	X	X	X	X
		2.1.1.7 Carry out investigations and research on AMR	Carry out 2 annual investigations of confirmed atypical AMR cases and clusters	MINPH MINEPIA MINADER MINEPDED TFPs	75,000,000	X	X	X	X	X
			Carry out 2 risk assessments for the emergence of AMR cases at the human-animal-environment interface	MINPH MINEPIA MINADER MINEPDED MINESUP PNPLZER TFPs	40,000 000		X		X	
2.2 Laboratory capacity building	2.2.1 Build the capacity of laboratories to detect common and resistant germs	2.2.1.1 Set up a functional national reference laboratory for AMR	Designate a national reference laboratory for AMR	CCM MINPH MINEPIA MINADER MINEPDED TFPs	0		X			

			Strengthen the technical platform of the national reference laboratory	CCM MINPH MINEPIA MINADER MINEPDED TFPs	200,000 000		X			
			Create a group of trainers in foreign laboratories: Training of 4 staff on the detection of AMR cases	CCM MINPH MINEPIA MINADER MINEPDED TFPs	60,000 000		X			
			Strengthen the capacities of the reference laboratory staff	CCM MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000		X	X		
		2.2.1.2 Strengthen the diagnostic capacities of laboratories capable of performing ASTs	Carry out, every two years, an evaluation of laboratories able to perform ASTs in human, animal, plant and environmental health.	MINPH MINEPIA MINADER MINEPDED TFPs	10,000 000		X		X	
			Improve the technical platform of laboratories able to perform ASTs in human, animal, plant and environmental health.	MINPH MINEPIA MINADER MINEPDED TFPs	100,000,000		X		X	

			Strengthen the capacities of 150 laboratory staff able to perform ASTs in human, animal, plant and environmental health.	MINPH MINEPIA MINADER MINEPDED TFPs	36,000 000		X		X	
			Organise 10 training sessions with mentoring for 150 laboratory staff from the 10 regions on the detection and performance of ASTs in human, animal, plant and environmental health	MINPH MINEPIA MINADER MINEPDED TFPs	50,000 000		X	X	X	X
			Organise 01 annual session to strengthen the quality management system in relation to international standards in AMR reference laboratories	MINPH MINEPIA MINADER MINEPDED TFPs	36,000,000			X	X	X
		2.2.1.3 Set up a multi-sectoral network of functional laboratories to ensure AMR surveillance	Lead discussions to set up a multi-sectoral network of functional laboratories to conduct AMR surveillance.	CCM MINPH MINEPIA MINADER MINEPDED TFPs	0	X	X			
			Legalise the multi-sectoral network of	CCM MINPH	0		X			

			functional laboratories to ensure AMR surveillance	MINEPIA MINADER MINEPDED TFPs						
	TOTAL									**986,500,000**
STRATEGIC OBJECTIVE III: Reduce infection by ensuring effective sanitation, hygiene and infection prevention measures										
PRIORITY ACTIONS	**OBJECTIVES**	**ACTIVITY**	**SUB-ACTIVITY**	**STRUCTURES IN CHARGE**	**COST (FCFA)**	**TIMELINE**				
						2024	**2025**	**2026**	**2027**	**2028**
3.1 Strengthen IPC/Multisectoral biosecurity at all levels	3.1.1 Reduce the risk of infection spread	3.1.1.1 Develop and disseminate a multi-sectoral national action plan for Infection Prevention and Control	Organise 01 workshop to develop the multi-sectoral national action plan for Infection Prevention and Control	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000		X			
			Organise 01 workshop for the validation of the multi-sectoral national action plan for Infection Prevention and Control	MINPH MINEPIA MINADER MINEPDED TFPs	9,000,000		X			

			Produce and disseminate 250 copies of the multi-sectoral national action plan for Infection Prevention and Control	MINPH MINEPIA MINADER MINEPDED TFPs	3,500,000		X	X		
		3.1.1.2 Develop the national legal framework for the prevention and control of environmental contamination by chemical residues, antimicrobials and resistant microorganisms	Conduct a national legal framework evaluation for the prevention and control of environmental contamination by chemical residues, antimicrobials and resistant microorganisms	MINPH MINEPIA MINADER MINEPDED TFPs	0	X				
			Organise 01 workshop to develop the national legal framework for the prevention and control of environmental contamination by chemical residues, antimicrobials and resistant microorganisms	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000		X			

			Organise 01 workshop for the validation of the national legal framework for the prevention and control of environmental contamination by chemical residues, antimicrobials and resistant microorganisms	MINPH MINEPIA MINADER MINEPDED TFPs	9,000,000		X			
		3.1.1.3 Develop and validate guidelines/standards for the dumping of antimicrobial chemical residues and resistant microorganisms into the environment	Organise 01 workshop to develop the guidelines/standards for the dumping of antimicrobial chemical residues and resistant microorganisms into the environment	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000		X			
			Organise 01 workshop to validate the guidelines/standards for the dumping of antimicrobial chemical residues and resistant microorganisms into the environment	MINPH MINEPIA MINADER MINEPDED TFPs	9,000,000		X			

		3.1.1.4 Develop, validate and disseminate two national biosafety guides (for plant health and animal health)	Organise 01 workshop to develop the national biosafety guide in plant health	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000		X			
			Organise 01 workshop to develop the national biosafety guide in animal health	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000		X			
			Organise 01 workshop to validate the national biosafety guide in plant health	MINPH MINEPIA MINADER MINEPDED TFPs	9,000,000		X			
			Organise 01 workshop to validate the national biosafety guide in animal health	MINPH MINEPIA MINADER MINEPDED TFPs	9,000,000		X			
			Produce and disseminate national biosafety guides (100 copies per sector)	MINPH MINEPIA MINADER MINEPDED TFPs	4,000,000		X	X	X	X
			Build the capacities of 250 fish farmers in biosafety measures on farms and at points of sale	MINPH MINEPIA MINADER MINEPDED TFPs	30,000,000			X	X	X
3.2 Strengthen the waste management system	3.2.1 Reduce the risk of human and animal infection spread into the	3.2.1.1 Review the national strategy for waste management in Cameroon	Organise 01 workshop to review the national strategy f or waste management in Cameroon	MINEPDED MINPH MINEPIA MINADER TFPs	12,000,000	X				

	environment		Organise 01 workshop to validate the national strategy for waste management in Cameroon	MINEPDED MINPH MINEPIA MINADER TFPs	9,000,000	X				
		3.2.1.2 Develop and disseminate standards for antimicrobial pollution in the environment	Conduct 01 national assessment of the risks of exposure to and spread of AMR in the environment by residues of antimicrobial compounds and resistant microorganisms	MINEPDED MINPH MINEPIA MINADER TFPs	10,000,000	X	X			
			Organise 01 workshop to develop the standards for antimicrobial pollution in the environment	MINEPDED MINPH MINEPIA MINADER TFPs	12,000,000		X			
			Organise 01 workshop to validate the standards for antimicrobial pollution in the environment	MINEPDED MINPH MINEPIA MINADER TFPs	9,000,000		X			
			Produce and disseminate standards for antimicrobial pollution in the environment	MINEPDED MINPH MINEPIA MINADER TFPs	3,000,000		X	X		

		3.2.1.3 Develop and disseminate the national biomedical waste management action plan	Organise 01 workshop to review the national action plan for biomedical waste management in Cameroon	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000		X			
			Organise 01 workshop to validate the national action plan for biomedical waste management in Cameroon	MINPH MINEPIA MINADER MINEPDED TFPs	9,000,000		X			
			Produce and disseminate the national biomedical waste management action plan (100)	MINEPDED MINPH MINEPIA	2,000,000			X	X	
			Organise annual coaching sessions for health facilities and agricultural, livestock and aquaculture production farms to develop their waste management plans.	MINEPDED TFPs	25,000,000		X	X	X	X
		3.2.1.4 Develop a guide on the development of municipal and inter-municipal household waste management and other related	Organise 01 workshop to develop a guide for municipal and inter-municipal household waste management and other related plans	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000		X			

		plans	Organise 01 workshop to validate the guide for municipal and inter-municipal household waste management and other related plans	MINPH MINEPIA MINADER MINEPDED TFPs	9,000,000		X			
			Produce and disseminate the municipal and inter-municipal (100) household waste management and other related plans	MINPH MINEPIA MINADER MINEPDED TFPs	2,000,000		X			
		3.2.1.4 Conduct environmental inspections at health facilities, agricultural production farms, livestock farms, aquaculture farms, wastewater treatment plants and waste management facilities	Conduct environmental inspections at health facilities, agricultural production farms, livestock farms, aquaculture farms, wastewater treatment plants and waste management facilities	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000		X	X	X	X
	TOTAL									**280,500,000**
STRATEGIC OBJECTIVE IV: Optimise the use of antimicrobials in human, animal, plant and environmental health										
PRIORITY ACTIONS	**OBJECTIVES**	**ACTIVITY**	**SUB-ACTIVITY**	**STRUCTURES IN CHARGE**	**COST (FCFA)**	**TIMELINE**				

						2024	2025	2026	2027	2028
4.1 Improve regulatory framework for antimicrobials and plant protection products	4.1.1 Ensure transparency in the management of drugs and plant health products, and protect the rights of consumers	4.1.1.1 Develop draft texts setting out a framework for the distribution, importation, marketing authorisation, sale and consumption of antimicrobials in the human, animal, plant and environmental health sectors.	Organise 01 workshop to develop draft texts to regulate the distribution of antimicrobials in the human, animal and plant health sectors.	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000	X	X			
			Organise 01 workshop to validate draft texts to regulate the distribution of antimicrobials in the human, animal, and plant health sectors.	MINPH MINEPIA MINADER MINEPDED TFPs	9,000,000	X	X			
			Organise 01 workshop to develop texts on the importation, marketing authorisation, commercialisation and consumption of antimicrobials, as well as pharmacovigilance in the human, animal, plant and environmental health sectors.	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000	X	X			

			Organise 01 workshop to validate texts on the importation, marketing authorisation, commercialisation and consumption of antimicrobials, as well as pharmacovigilance in the human, animal, plant and environmental health sectors.	MINPH MINEPIA MINADER MINEPDED TFPs	9,000,000	X	X			
4.2 Implementation of good conservation, prescription, dispensing and use of antimicrobial agents	4.2.1 Ensure the monitoring of antimicrobial use	4.2.1.1 Build the capacities for routine data collection on the use of antimicrobials in the human, animal, plant and environmental health sectors	Organise 01 workshop to develop the systematic data collection mechanism on the use of antimicrobials in the human, animal, and plant health sectors.	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000	X	X			
			Produce and disseminate 500 systematic data collection mechanism on the use of antimicrobials in the human, animal, plant and environmental health sectors.	MINPH MINEPIA MINADER MINEPDED TFPs	3,000,000	X	X			

			Build the capacities of 500 stakeholders in the systematic collection and analysis of data on the use of antimicrobials in the human, animal, plant and environmental health sectors.	MINPH MINEPIA MINADER MINEPDED TFPs	60, 000, 000		X	X	X	X
			Conduct 02 pilot studies on data relating to the quantities of antimicrobials sold in the human health (importers/wholesalers and pharmacists), animal health (importers/wholesalers, retail pharmacists) and agricultural (pesticide importers and distributors) sectors.	MINPH MINEPIA MINADER MINEPDED TFP	27,200,000	X	X			
		4.2.1.2 Review the national multisectoral action plan for the effective management of antimicrobials and the guides to good practice for diagnosing, prescribing and	Organise 01 workshop to review the national multisectoral action plan for the proper management of antimicrobials (NAP-GAM) in Cameroon, including aspects relating to	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000		X			

		using antimicrobials in the human, animal and plant health sectors.	aquaculture.							
			Organise 01 workshop to review the national multisectoral action plan for the proper management of antimicrobials (NAP-GAM) in Cameroon, including aspects relating to aquaculture.	MINPH MINEPIA MINADER MINEPDED TFPs	9,000,000		X			
			Organise 01 dissemination and popularisation session of the national multi-sectoral action plan (100) for the good management of antimicrobials in Cameroon by integrating aspects of aquaculture	MINPH MINEPIA MINADER MINEPDED TFPs	3,000,000			X		
		4.2.1.3 Strengthen good diagnostic and prescription	Organise 01 workshop to	MINPH MINEPIA MINADER	12,000,000		X			

		practices – use of antimicrobials for the human, animal and plant health sectors	develop guides to good diagnostic and prescription practices – use of antimicrobials for the human, animal and plant health sectors	MINEPDED TFP						
			Organise 10 sessions to disseminate and popularise good practice guides for diagnosis, prescription and use of antimicrobials among prescribers and laboratory personnel in the human, animal and plant health sectors	MINPH MINEPIA MINADER MINEPDED TFPs	30,000,000			X	X	X
		4.2.1.4 Develop and validate the list of antimicrobials according to the AWaRe, WOAH, IPPC classification	Organise 01 workshop to develop the list of antimicrobials according to the AWaRe, WOAH, IPPC classification	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000	X			s	

			Organise 01 validation workshop of the list of antimicrobials according to the AWaRe, WOAH, IPPC classification	MINPH MINEPIA MINADER MINEPDED TFPs	9,000,000	X				
			Disseminate the list of antimicrobials according to the AWaRe classification	MINPH MINEPIA MINADER MINEPDED TFPs	2,000,000	X				
	TOTAL									**233,200,000**
STRATEGIC OBJECTIVE V: Improve the managerial and governance process in administrations involved in the fight against AMR by strengthening standardisation, M/E, regulation and accountability										
PRIORITY ACTIONS	**OBJECTIVES**	**ACTIVITY**	**SUB-ACTIVITY**	**STRUCTURE IN CHARGE**	**COST (FCFA)**	**TIMELINE**				
						2024	**2025**	**2026**	**2027**	**2028**
5.1 Effective management procedure	5.1.1 Ensure optimal management of NAP-AMR 2023–2027	5.1.1.1 Formalise the creation of the National Coordination Committee for the fight against antimicrobial resistance	Organise 01 workshop to develop the legal framework of the National Coordination Committee for the fight against antimicrobial resistance	MINPH MINEPIA MINADER MINEPDED TFPs	12,000, 000	X				

			Organise 01 workshop to validate the legal framework of the National Coordination Committee for the fight against antimicrobial resistance	MINPH MINEPIA MINADER MINEPDED TFPs	9,000,000	X				
		5.1.1.2 Operationalizing the CCM to fight against AMR	Organise 02 advocacy meetings of the CCM operation to fight against AMR	MINPH MINEPIA MINADER MINEPDED TFPs	3,500, 000	X		X		
			Organise 02 annual sessions on the functioning of the CCM	MINPH MINEPIA MINADER MINEPDED TFPs	45,000,000	X	X	X	X	X
		5.1.1.3 Develop an operational plan for NAP-AMR by sector	Organise 01 workshop to develop the NAP-AMR operational plan by sector	MINPH MINEPIA MINADER MINEPDED TFPs	12,000,000		X			
		5.1.1.4 Monitor and evaluate the implementation of the 2023–2027 NAP-AMR	Organise 01 annual supervision mission in each sector to ensure monitoring of activities to fight against AMR	MINPH MINEPIA MINADER MINEPDED TFPs	40,000,000		X	X	X	X

			Conduct 01 midterm evaluation and 01 final evaluation of the 2023–2027 NAP-AMR	MINPH MINEPIA MINADER MINEPDED TFPs	24,000,000			X		X
	TOTAL									**202,500,000**
	OVERALL TOTAL (FCFA)									**2,498,700,000**

BUDGET PER STRATEGIC OBJECTIVE

The overall budget is **2,498,700,000 CFA** distributed per objective as follows:

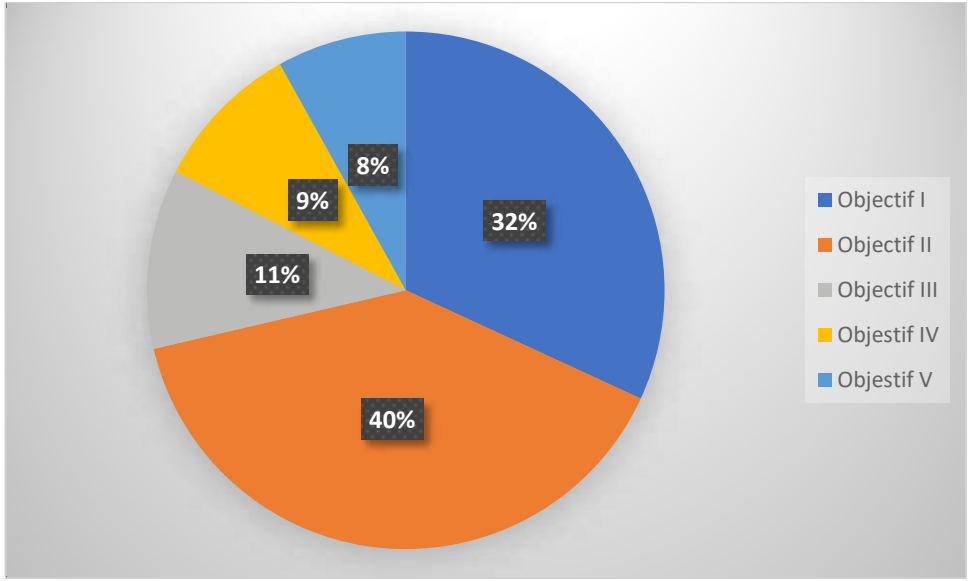

Figure 2: Budget distribution per strategic objective

CHAPTER 5: MONITORING AND EVALUATION FRAMEWORK OF THE 2024–2028 NAP-AMR

Monitoring-evaluation aims to provide an overall vision of performance in implementing the national plan to fight against AMR and to inform CCM about actions to be taken to ensure optimal implementation of its activities.

In this line, the monitoring-evaluation system draws from the operational plan which breaks down the strategic objectives into actions and activities with monitoring indicators for implementation and impact. To fill these indicators, an information feedback mechanism will be put in place based on the tools available in the different administrations involved in the fight against AMR.

5.1. MONITORING MECHANISMS

Monitoring is a continuous process which will involve ensuring the proper implementation of the national plan against AMR by providing periodic information on the implementation of activities, and the difficulties encountered.

Three major points must be considered to successfully implement this plan. These are:

(i) Setting up NAP-AMR steering and monitoring-evaluation bodies;

(ii) Definition of roles, responsibilities and methods for monitoring this plan;

(iii) Mobilisation of financial and human resources so that this monitoring is effective.

Concretely, the following tools will be used:

- The indicators dashboard found in the operational plan: this table has all the key monitoring indicators, the methods of calculation and reporting;

- Activity monitoring sheets: They provide information on the calendar of activities, the level of implementation of the various tasks, the consumption rate of financial resources; any difficulties encountered and adjustments made;
- Activity reports: The overall activity report will mainly be supplied by the activity reports of the different technical working groups.

5.2. EVALUATION OF NAP-AMR

The evaluation will aim to assess the implementation of the national action plan for the fight against AMR in terms of effectiveness, efficiency, impact, viability and relevance in relation to the health sectoral strategy. It allows us to appreciate the positive changes recorded in the fight against AMR. Two evaluations are envisaged, namely:

The midterm evaluation: It will enable to follow-up the progress of physical and financial achievements, to identify the difficulties encountered and to formulate recommendations in order to improve performance during implementation;

The final evaluation: It will aim to assess the results of the actions carried out in relation to the objectives set. It will also fuel dialogue between the Government and its partners on the lessons to be learnt from the implementation of the national plan to combat +- AMR. The recommendations resulting from this evaluation will be capitalised on to sustain the fight against AMR.

Table III: 2023–2027 monitoring and evaluation framework

STRATEGIC OBJECTIVE I: Improve awareness and understanding of antimicrobial resistance through communication, effective education and training										
Activity	**Indicator**	**Calculation method**	**Baseline**	**Projected total target**	**2024 Target**	**2025 Target**	**2026 Target**	**2027 Target**	**2028 Target**	**VERIFICATION SOURCE**
Assess the level of knowledge, attitudes and practices (KAP studies) on AMR in human, animal, plant and environmental health professionals	Proportion of KAP studies conducted	Number of KAP studies conducted/Number of studies planned	AFROHUN KAP studies (2017)	4	0	4	0	0	0	Investigation report
Finalize, validate and produce the communication plan according to the 'One Health' approach for the fight against AMR	Available communication plan	NA	2021 draft plan	1	0	1	0	0	0	Communication plan
Strengthen AMR communication capacities using the 'One Health' approach	Proportion of central and regional level focal points trained on AMR communication Proportion of actors from decentralised services involved in the fight against AMR trained in AMR communication	Number of trained focal points /Number of focal points at central and regional level Number of decentralised service actors trained/Number of decentralised service actors involved in the fight against AMR		444 (161 in human health, 141 in animal health, 71 in plant health and 71 in environmental health)	44	100	100	100	100	Training reports

Carry out awareness-raising activities on AMR	Number of awareness sessions carried out on the importance of AMR in regional and private veterinary clinics, in HFs and among farmers	Count down of the awareness sessions		16	0	4	4	4		Session reports
Promote communication on AMR	Number of global antimicrobial stewardship weeks organised	Count down of organised global weeks		5	1	1	1	1		Review activity reports
Integration of AMR modules into university training curricula	Number of advocacy meetings organised for the integration of modules	Count down of organised advocacy meetings		2	0	1	1	0		Meeting reports
Organisation of capacity-building sessions for actors at the central and decentralised level in the fight against AMR	Number of capacity-building sessions organised	Count down of organised sessions		2	0	1	1	0	0	Meeting reports
Capacity building of actors (trainers) involved in the fight against AMR	Number of actors involved in the fight against AMR at central and decentralised	Count down of actors trained in the fight against AMR at central and decentralised level		600 (200 in human health, 150 in animal health, 125 in		250	250	250	250	Training reports

	level, trained in the fight against AMR according to the themes			environment al health and 125 in plant health)							

STRATEGIC OBJECTIVE II: Build knowledge and evidence through monitoring and research										
Activity	**Indicator**	**Calculation method**	**Basel ine**	**Total projected target**	**2024 Target**	**2025 Target**	**2026 Target**	**2027 Target**	**2028 Target**	**SOURCE OF VERIFICATION**
Capacity building of actors at all key level sectors in the fight against AMR on the SOPs of surveillance of infections caused by antimicrobial resistant pathogens	Proportion of actors in decentralised AMR control services trained on the SOPs developed	Number of actors from decentralised services involved in the fight against AMR trained on the SOPs developed/Number of actors planned for training		100 (25 in human health, 25 in animal health, 25 in plant health and 25 in environment al health)	0	0	50	50	0	Training reports
Develop, validate and produce a SOP manual on AMR surveillance in environmental health	An available SOP manual on AMR surveillance in environmental health	Availability of the manual		1	0	1	0	0	0	Reports/SOP manual for AMR surveillance in Environmental health

Develop, validate and produce a SOP manual for AMR surveillance of pest and plant products in plant health	An available SOP manual for AMR surveillance of pest and plant products in plant health	Availability of the manual		1	0	0	1	0	0	Reports/SOP manual for AMR surveillance in Environmental health
Revise and produce the National Integrated AMR Surveillance Guide by integrating aspects related to fishery production in animal and plant health	A national revised and available integrated AMR surveillance guide	NA		1	0	1	0	0	0	Revised National AMR Integrated Surveillance Report/Guide
Share information on AMR surveillance data	Proportion of annual AMR surveillance reports produced Proportion of biannual surveillance reports produced	Number of annual surveillance reports produced/Number of reports planned for the period Number of biannual surveillance reports produced/Number of reports planned for the period		15	3	3	3	3	3	Surveillance report

Monitor and evaluate AMR surveillance activities	Proportion of biannual supervision of surveillance sites carried out	Number of supervision conducted/Number of supervision planned for the period		9	1	2	2	2	2	Supervision report
Conduct investigations and research on AMR	Proportion of investigation and research missions carried out	Number of investigation and research missions carried out/number of missions planned		2	0	1	0	1	0	Reports on supportive evaluation missions
Establish a functional national reference laboratory for AMR surveillance	A national reference appointed and equipped laboratory a	NA		1	0	1	0	0	0	Appointment Decision/Operating budget
	Build the capacities of the reference laboratory staff	Number of reference laboratory staff trained	0	4	0	4	0	0	0	Training Report
Build the diagnostic capacity of staff in	Number of evaluations carried out	Evaluation count down		2	0	1	0	1	0	Evaluation report

laboratories able to perform antimicrobial susceptibility testing (AST)	Number of training sessions including mentorship organised for laboratory staff in the ten Regions on the continuous detection and performance of AST for the human, animal and plant health sectors	Count down of the training sessions including mentorship		10	0	3	4	3	0	Training Report
Establish a multi-sectoral network of functional laboratories to ensure AMR surveillance	A multi-sectoral network of functional laboratories for AMR surveillance including LNAD and LANACOME has been set up and is operational.	NA		1	0	1	0	0	0	Appointment Decision/Network activity reports/Meeting reports
STRATEGIC OBJECTIVE III: Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures										
Activity	**Indicator**	**Calculation method**	**Basel ine**	**Total target projected**	**2024 Target**	**2025 Target**	**2026 Target**	**2027 Target**	**2028 Target**	**SOURCE OF VERIFICATION**
Develop and disseminate a national multi-sectoral plan for infection prevention and control	A national multi-sectoral plan for infection prevention and control is available	NA		1	0	1	0	0	0	Reports/national multi-sectoral plan for IPC

Draw up the national legal framework for the prevention and control of environmental contamination by chemical residues, antimicrobials and resistant microorganisms	Compendium of available texts and analysis reports	NA		1	1	1	0	0	0	k Workshop report feedback
Develop and validate guidelines/standards for the disposal of chemical residues, antimicrobials and resistant microorganisms into the environment	Guidelines/standards for the disposal of chemical residues, antimicrobials and resistant microorganisms into the environment have been developed and are available	NA		1	0	1	0	0	0	Reports of the workshops to develop and validate the guidelines
Develop, validate and disseminate two national biosafety guides (for plant and animal health)	A national biosafety Guide for plant health is available, A national biosafety Guide for animal health is available	NA		2	0	2	0	0	0	Reports of the development and validation workshops/National biosafety guide for animal health/National biosafety guide for plant health
Review Cameroon's national waste management strategy	The revised national waste management strategic plan is available	NA		1	1	0	0	0	0	Validation workshop report

Develop and disseminate standards for antimicrobial pollution in the environment	Standards document available	NA		1	1	0	0	0	0	Reports of the development and validation workshops
Develop and disseminate a national action plan for the management of biomedical waste	The national action plan for the management of biomedical waste is available	NA		1	0	1	0	0	0	A hard copy of the national action plan for the management of biomedical waste
Develop, validate and disseminate a guide for the development of communal and inter-communal plans for the management of household and similar waste	A guide for the development of communal and inter-communal plans for the management of household and similar waste is available	NA		0	0	1	0	0	0	Hard copy of the guide for the development of communal and inter-communal plans for the management of household and similar waste
Carry out environmental inspections in health facilities, agricultural, livestock and aquaculture farms, water treatment plants and waste management facilities.	Proportion of environmental supervision missions carried out	Number of supervisions carried out/number of planned missions		8	0	2	2	2	2	Supervision report
STRATEGIC OBJECTIVE IV: Optimise the use of antimicrobials in human, animal, and plant health										
Activities	**Indicator**	**Calculation method**	**Basel ine**	**Total target projected**	**2024 Target**	**2025 Target**	**2026 Target**	**2027 Target**	**2028 Target**	**VERIFICATION SOURCE**

Develop draft regulations governing dispensing, import, marketing authorisation, distribution and consumption of antimicrobials in human, animal and plant health sectors	Draft regulations governing dispensing, import, marketing authorisation, distribution and consumption of antimicrobials in human, animal and plant health sectors are available	NA		2	1	1	0	0	0	Draft texts/activity report
Build the capacities of 500 actors on the systematic data collection and analysis for the use of antimicrobials in human, animal and plant health sectors	Proportion of actors trained on the systematic data collection and analysis for the use of antimicrobials in human, animal and plant health sectors	Number of actors trained/number planned	**0**	500 (250 in human health, 150 in animal health, and 100 in plant health)	0	150	150	100	100	Training Report
Review the national multi-sectoral action plan for the management of antimicrobials in Cameroon (NAP-GAM), including issues related to aquaculture	The 2021-2023 National multi-sectoral action plan for the management of antimicrobials in Cameroon has been reviewed and is available	NA		1	0	1	0	0	0	Hard copy of the multi-sectoral action plan for the management of antimicrobials

Develop good practice guides in diagnosis, prescription and use of antimicrobials for the human, animal and plant health sectors	A good practice guide in diagnosis, prescription and use of antimicrobials is available	NA		1	0	1	0	0	0	Hard copies and activity reports
Organise 10 sessions for the dissemination and popularization of the good practice guides in the diagnosis, prescription and use of antimicrobials to prescribers and laboratory staff in the human, animal and plant health sectors.	Proportion of sessions organised for the dissemination and popularization of the good practice guides in the diagnosis, prescription and use of antimicrobials to prescribers and laboratory staff in the human, animal and plant health sectors.	Number of sessions organised/number of sessions planned	0	10	0	4	4	2	0	Activity report
Strengthen good practice in diagnosis, prescription and use of antimicrobials for the human, animal and plant health sectors	Number of suppliers (prescribers and laboratory staff) in the human, animal and plant health sectors trained on good practice in diagnosis, prescription and use of antimicrobials	Number of suppliers trained/Number planned		1000	0	0	350	350	300	Activity report

Draw up and validate a list of antimicrobials according to the AWaRe, WOAH and IPPC classifications	List of antimicrobials according to the AWaRe, WOAH and IPPC classifications available			1	0	1	0	0	0	Activity report

STRATEGIC OBJECTIVE V: Improve the management process and governance in the administrations involved in the fight against AMR by strengthening standardisation, monitoring/evaluation, regulation and accountability										
Activity	**Indicator**	**Calculation method**	**Baseline**	**Total target projected**	**2024 Target**	**2025 Target**	**2026 Target**	**2027 Target**	**2028 Target**	**VERIFICATION SOURCE**
Formalise the establishment of the National Coordination Committee for the fight against AMR	A legal framework for the MCC has been developed	NA		1	1	0	0	0	**0**	Activity report/Legal framework
Making the MCC operational in the fight against AMR	Funding mobilised for the operation of the MCC Proportion of MCC operating sessions	Total funding mobilised from the various stakeholders Number of MCC sessions organised/ number of MCC sessions planned		100% 9	0% 1	30% 2	50% 2	20% 2	0 2	Review of funding agreements Activity report
Develop a NAP-AMR operation plan per sector	A NAP-AMR operation plan per sector is available	NA		4	0	4	0	0	0	Activity reports/operation plan

Monitoring and evaluation of the implementation of the NAP-AMR 2023–2027	Number of 2023–2027 NAP-AMR midterm evaluations Number of the 2023–2027 NAP-AMR final evaluations	Evaluation count down		2	0	0	1	0	1	Evaluation report

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APPENDICES

APPENDIX 1. ANALYSIS OF THE STRENGTHS- WEAKNESSES-OPPORTUNITIES-THREATS (SWOT)

STRENGTHS	WEAKNESSES
• Existence of per sector focal points (Ministries of Health, environment, livestock and agriculture) • Strong commitment of stakeholders in the fight against AMR • Existence of an integrated surveillance guide for the fight against AMR • Availability and dissemination of SOPs Surveillance in human and animal health • Establishment of a functional sentinel surveillance system integrating the human, animal and environmental sectors in a few pilot sites (8) with availability of tools • Existence of certain laboratories for the analysis of antimicrobial residues (LNAD and LANAVET) • Training and mentoring of sentinel site staff in terms of diagnosis and AST • Existence of a Guide and an PCI plan in human health • Existence of a national waste management guide in hospitals • Development of the medical waste management plan which is a regulatory requirement (art13 of Decree No. 2012/2809/PM of 26 September 2012	• Low mobilization of funds for the fight against AMR • Absence of a national communication strategy on AMR • Lack of integration of AMR training progras • Lack of a training program targeting aquaculture producers • Absence of a systematic collection system for UAM • Lack of implementation of monitoring activities on aquaculture, plant and environmental samples • Absence of a multi-sector coordination group • Lack of a PCI program • Absence of a biosecurity guide on farms • Poor consideration of hospitals in general in planning inspections • Insufficient control of the distribution circuit of medicines and products for veterinary use • Absence of a municipal waste management guide • Lack of a national policy to avoid the use of critically important antimicrobials • Absence of a PAN- AMR operational plan

setting the conditions for sorting, collection, storage, transport, recovery, recycling, treatment and final waste disposal) • Existence of Order No. 003/MINEPDED of 15 October 2012 setting the specific conditions for the management of medical and pharmaceutical waste, existence of the hospital waste management guide • Existence of a national committee and regional inspection committees of classified institutions • Existence of functional approval committees for antimicrobials and phytosanitary products in all sectors involved in AMR • Existence of a multi-sector antimicrobial management plan • Existence of a decentralized system for surveillance in the agricultural sector • Existence of laboratories informing decision-making [Detection of residues, detection of harmful elements, etc.] in agricultural products • Existence of CODEX Alimentarius for quality assurance of food products • Existence of National Standards with specific focus on AMR • Technical and financial support from national and international partners • Revision of the PAN- AMR in progress • Existence of universities, schools and research institutions in all regions of the country. • Acceleration of the ongoing decentralization process, making local authorities in key sectors functional in the fight against AMR	• Absence of mid-term evaluation of the PAN- AMR • Quality control of pesticides not effective in developed services • Weak consideration of AMR in the action plans/budgets of the different sectors. • Leadership conflict in the strategic and operational management of AMR • Existence of places of storage and sale of unapproved antimicrobials and pesticides
OPPORTUNITIES • Increased interest in AMR internationally • Mobilization of partners • Existence of programmes to fight malaria, HIV/AIDS, TB	**THREATS** • Lack of funding • Health crises [COVID-19, Monkey Pox, etc.] • Porosity of borders

APPENDIX 2. REGULATORY INSTRUMENTS ON AMR IN CAMEROON

- Standards and Classification of Biomedical Analysis Laboratories in Cameroon.
- Rural Sector Development Strategy/National Agricultural Investment Plan RSDS/NAIP [2020/2030]
- Phytosanitary Law: Law No. 2003/003 of 21 April 2003 on Phytosanitary Protection
- Decree No. 2005/118 of 15 April 2005 to organize the Ministry of Agriculture and Rural Development

APPENDIX 3. LIST OF CAMEROON STANDARDS ON ANTIMICROBIAL RESISTANCE

No.	Standard Code	Year and Technical Committee	ICS Code	Title	Ref. International Standard – *Ref. Codex Alimentarius* –
294	NC 293: 2014	2014-CT 48	67,020	Code of Practice to minimise and control antimicrobial resistance	CAC/RCP 61-2005 *–CXC 61–2005 –*
295	NC 295: 2014	2014-CT + 48	67,020	Code of Practice to minimise and control antimicrobial resistance	CAC/RCP 62-2006 *–CXC 61–2005 –*
366	NC 365: 2014	2014-CT 40	-	Guidelines for the analysis of risks related to antimicrobial resistance of food origin	CAC/GL 77 – 2011 *–CXG 77 - 2011 –*

Sources: ANOR – https://www.anor.cm/catalogue-normes; website consulted on 14/07/2022 – – 28 – ; Codex Alimentarius – https://www.fao.org/fao-who-codexalimentarius/themes/antimicrobial-resistance/fr/?page=2&ipp=3&tx_dynalist_pi1[par]=YToxOntzOjE6IkwiO3M6MToiMSI7fQ; site visité le 14/07/2022][29]