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SUPPORTING THE VETERINARY AND AQUACULTURE SECTOR IN THE IMPLEMENTATION OF THE NATIONAL ACTION PLAN FOR CONTAINMENT OF ANTIMICROBIAL RESISTANCE

November 2022

SDGs:



Country:

Maldives

Project Code:

TCP/MDV/3702

FAO Contribution:

USD 198 000

Duration:

1 September 2019 – 31 December 2021

Contact Info:

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Implementing Partner

Ministry of Fisheries, Marine Resources and Agriculture (MoFMRA).

Beneficiaries

Maldives Marine Research Institute staff; Maldives National University staff; employees and workers in the veterinary and aquaculture sectors of Maldives.

Country Programming Framework (CPF) Outputs

CPF (2018-2020) Output 1.1: Targeted stakeholders, including the private sector, enabled to establish and encourage sustainable and profitable food systems allowing producers, in particular women and youth, to produce and market fresh, safe and nutritious foods for the local market, urban areas and the tourism sector, taking account of climate change.



BACKGROUND

The need to address the risk of antimicrobial resistance (AMR) to human and animal health has grown on the international political agenda in the last years. In 2015, the World Health Assembly adopted an AMR global action plan advocating for a One Health approach and encouraging each country to adopt its own, targeted national strategy to deal with AMR's negative impact on animal welfare and food security.

Maldives has followed through on the recommendation, developing the National Action Plan for Containment of Antimicrobial Resistance (2017-2022). The strategy was informed by the country's geographical context and structure of its public health, livestock and aquaculture sectors. In the past, the lack of commercial livestock food production limited the need for and development of veterinary health systems. Recently, the Government of Maldives has pushed for greater food self-sufficiency and security, putting emphasis on farm diversification into poultry and goat farming, as well as aquaculture. In collaboration with FAO, the Government identified the capacity needs of the Ministry of Fisheries, Marine Resources and Agriculture (MoFMRA) to carry out AMR surveillance, infection prevention and control, prudent antimicrobial use, and research and innovation in the agriculture sector.

The Government requested FAO's support to upscale the capacity of veterinary and aquaculture sectors to implement the country's AMR national action plan. The project aimed to improve the understanding of AMR among farmers, develop the capacity of relevant stakeholders to carry out research on AMR in the agriculture sector, and develop infection prevention and control guidelines in the livestock and aquaculture areas.

IMPACT

The expected impact of the project was to ensure safe food and animal production, by reducing the risk of antimicrobial resistance in Maldives.

ACHIEVEMENT OF RESULTS

The project aimed to support the enhanced capacity of veterinary and aquaculture sectors in the implementation of the Maldives National Action Plan for Containment of Antimicrobial Resistance (2017-2022). The project contributed, in collaboration with Maldives National University, to a baseline study on livestock farming and to improving farmers' knowledge, attitudes and practices relating to antimicrobial resistance. Ten farmers were interviewed and a focus group discussion was organized. The study provided useful information on farmers' practices, the expansion of the country's livestock sector, and the importance of an evidence-based awareness-raising campaign on the effects of antimicrobial resistance on animal health and corollary veterinary recommendations. Preliminary results indicated that the majority of farmers had limited knowledge of AMR and seldom used antibiotics. However, with the sector's expansion, the use of antimicrobials may increase. In addition, the project improved the Maldives Marine Research Institute's capacity and infrastructure by developing standard operation procedures and procuring relevant laboratory equipment. The collaboration led to capacity development on AMR data generation and interpretation, which is useful, in the long run, for independent AMR monitoring in the country's agriculture sector.

Based on a survey of existing farming practices relevant for assessing the use of antimicrobials, the project identified areas for critical improvement and elaborated infection and prevention control guidelines. For example, recommendations included requirements for hatcheries and animal holding facilities, as well as procedures for identifying disease and quarantine areas.

IMPLEMENTATION OF WORK PLAN AND BUDGET

The project was subject to reprogramming due to the challenges resulting from the COVID-19 pandemic. The public health situation forced the Government to significantly focus its attention on the pandemic response, reducing the project's resources and buy-in. In addition, at the institutional level, several Letters of Agreement (LoAs) were not finalized with the project partners, which impacted the implementation. For these reasons, the project was extended by six months without a budget increase. The logframe below provides reporting information on the actual use of funds.

As background information on the livestock sector was missing or not updated, the project team, together with university officers, concentrated their initial efforts on setting up a study on farmers' practices and their knowledge concerning AMR. The study's methodology was also affected by the COVID-19 pandemic. For example, traveling to islands to conduct in-person interviews proved impossible, given the travel restrictions in place at the time. The last planned output, regarding the development of a policy document to improve the use of antimicrobials in veterinary and aquaculture sectors, could not be carried out, and a number of other activities could only be partially achieved.

FOLLOW-UP FOR GOVERNMENT ATTENTION

It is recommended that the Government perform a review of the existing legal frameworks and guidelines regarding control, containment, culling and disposal of infected animals, and livestock products, to ensure the effective and efficient management of animal disease outbreaks.

Furthermore, it is advised that a comprehensive situation analysis of the livestock farming sector be carried out in order to understand the practices and background information, prior to undertaking specific studies such as the AMR knowledge, attitudes and practices (KAP) study. The expansion of the agriculture sector may have an impact on the increased use of antibiotics in farms, which indicates the need for further research to study this intercorrelation, and for evidence-based awareness-raising campaigns.

It will also be necessary to provide further practical training to the staff of the Maldives Marine Research Institute, in collaboration with other laboratories with more experience, concerning fish pathogens analysis and antimicrobial susceptibility testing. This will ensure that the Institute is able to perform a correct diagnosis of the principal pathogenic bacteria that can lead to diseases in the main Maldivian farmed fish species. Another significant element concerning AMR statistics, in addition to the correct organization and collection of primary data, is their integration with other data sets. In this regard, it is recommended that relevant information produced by the Maldives Marine Research Institute be compared with those of other public institutions (e.g. the National Health Institute). A future collaboration with statisticians should be carefully evaluated for a reliable analysis of these fundamental data on AMR.

SUSTAINABILITY

1. Capacity development

The project has enhanced the capacity of the Maldives Marine Research Institute to undertake AMR data generation, management, analysis and interpretation relevant to independently monitor the risk of AMR in the relevant sectors.

2. Gender equality

Officials of the Maldives Marine Research Institute and Maldives National University, comprising both men and women, participated in the project training activities. The AMR national action plan and related measures are designed to address the interests of both men and women beneficiaries.

3. Technological sustainability

The project aimed to increase the capacity of relevant research stakeholders to carry out specific analyses on the state of AMR in the veterinary and aquaculture sectors. The elaboration of relevant sampling frameworks, standard operation procedures and technical protocols can support the effective implementation of the national action plan to counteract AMR.

DOCUMENTS AND OUTREACH PRODUCTS

- ❑ **Manfrin, A.** December 2021. *Maldivian Aquaculture Antimicrobial Resistance Monitoring and Surveillance Guidelines*. 44 pp.
- ❑ **Manfrin, A.** December 2021. *Draft Standard Operating Procedure: Method for antimicrobial Broth Dilution (Minimal Inhibitory Concentration- MIC) isolated from aquatic animals susceptibility Testing of Bacteria*. 10 pp.
- ❑ **Manfrin, A.** December 2021. *Draft Standard Operating Procedure Disk Diffusion Susceptibility Testing of Bacteria isolated from aquatic animals*. 7 pp.
- ❑ **Jayawickrama, G.G.I.A.** January 2022. *Report of the Antimicrobial Resistance (AMR) Infection and Prevention and Control*. 68 pp.
- ❑ **Jayawickrama, G.G.I.A.** January 2022. *Guide to Good Farming Practices for Animal Production Food Safety*. 6 pp.
- ❑ **Jayawickrama, G.G.I.A.** January 2022. *Assessment on Good Laboratory Management Practices*. 7 pp.
- ❑ **Sujatha, R.** 2021. *English translation of Animal Domestication and Health Bill*. 32 pp.
- ❑ **Glova, N.** 2021. *Presentation on Orientation to the Kap+ Survey and KAP+ Survey Instruments*. 22 pp.
- ❑ **Glova, N.** 2021. *Presentation on Pre-testing of the Kap+ Survey and KAP+ Survey*. 17 pp.



ACHIEVEMENT OF RESULTS - LOGICAL FRAMEWORK

Expected Impact	Safe food and animal production through reducing the risk of antimicrobial resistance		
Outcome	Capacity of veterinary and aquaculture sectors enhanced in the implementation of the Maldives National Action Plan for Containment of Antimicrobial Resistance (2017-2022)		
	Indicator	AMR prevention is included in the Ministry of Fisheries, Marine Resources and Agriculture budget.	
	Baseline	Phase 0.	
	End Target	Phase 1 accomplished.	
	Comments and follow-up action to be taken	Phase 1 was partially accomplished, as described below.	
Output 1	Improved awareness and understanding of antimicrobial resistance among critical stakeholders of the agriculture sector		
	Indicators	Target	Achieved
	Evidence based communication campaigns are tailored for target groups in the agriculture sector and their effectiveness demonstrated.	At least one communication campaign developed and implemented.	Partially
Baseline	0		
Comments	<p><i>University study on knowledge, attitudes and practices of antimicrobial resistance</i> In collaboration with Maldives National University (MNU), a study on the livestock farming sector and its vendors was carried out, which included site visits, one focus group discussion, background information and data from ten surveys about farmers' knowledge, attitudes and practices regarding antimicrobial resistance. The MoFMRA was consulted in the study design phase and was instrumental in sharing available background information on farmers, vendors and veterinarians who had voluntarily registered their properties.</p> <p><i>Challenges encountered</i> At the institutional level, the planned LoA was not signed with MNU. At the operational level, the study team encountered several challenges, including the unavailability of background information or published reports on the livestock sector in Maldives, which could inform the survey's design and distribution. For this reason, initially, MNU had to spend time on understanding and gathering information on the overall farming practices in the country. This resulted in a major delay of the survey's launch. The information provided by the government authorities during the initial phase was not entirely sufficient to understand the situation on the ground, as they also did not have updated information on the number of farms and livestock, or other such details. The MNU was able to informally gather additional information as they continued interacting with the farmers.</p> <p>In addition, MNU experienced difficulties reaching out to farmers to conduct the study, because farmers are not required by law to register their properties. The Ministry provided a list of farmers and vendors, although the numbers were very limited and contact information was not available for most farms and retailers. Therefore, the contact information was obtained through individuals who knew someone engaged in livestock farming. As a result, obtaining farmers and farm owners' contact information took some time.</p> <p>Furthermore, MNU staff did not have an accurate number of the livestock farms/backyards farms in the country or number of people working in this industry. Hence, it was not possible to calculate the sample size for the study, as originally planned. The survey was designed to collect data through telephone interviews. This survey approach proved ineffective in the context of Maldives for several reasons. Farmers were often unavailable when contacted and had to be contacted several times to schedule interviews. Although phone interviews were held at scheduled times, farmers were unable to commit to long interviews, which took approximately 40 minutes to complete, as it was necessary to explain the technical information. Some farmers who agreed to continue the interview later were not available subsequently. Some of the technical terms had no corresponding local terminology, therefore participants had some difficulties understanding the questions. The MNU considered doing in-person interviews due to the challenges involved in conducting telephone surveys. However, this was not feasible due to constraints in time and budget, as well as the geographical isolation of the islands, where farms were located. Travel to easily accessible islands was not possible due to weather conditions and travel restrictions related to the COVID-19 pandemic. Some of the challenges became apparent only after the implementation of the surveys had begun, delaying the progress of activities as per the original timeline. However, in spite of these challenges, the project managed to collect data from ten farmers and one focus group.</p>		

Activity 1.1	Develop and implement an evidence-based AMR risk communication to critical stakeholders of the agriculture sector		
	Achieved	Partially	
	Comments	<p><i>Overall assessment</i> The MNU identified the difficulties in progressing with the study and found ways to address them to continue the assignment. Interactions with farmers, vendors, and other organizational stakeholders provided valuable information on the present state and practices of farming in Maldives. During one visit to an agricultural facility in Maldives' southernmost atoll, it was found that farmers were in the process of establishing a large-scale intensive poultry farm. During the survey, some farmers reported their plan to expand their farms and diversify the range of livestock. Hence, the expansion of the livestock farming sector is expected in the near future and would need to be comprehensively studied.</p> <p><i>On the importance of AMR awareness campaigns</i> The urgent need to conduct further studies and awareness campaigns on AMR for the livestock sector was apparent from the preliminary data collected. From the initial enquiries with farmers and the information that was gathered, it emerged that farmers were increasing the number of livestock and diversity of farming types across the country. Even with the small sample size, insights were gained into the country's farming sector. Preliminary findings indicated that the majority of farmers in the survey had limited knowledge of antibiotics, and most of them reported that they did not use antibiotics in their farms. However, with the expansion of this sector, use of antibiotics may increase. In addition, from site visits to pet shops, it emerged that shop assistants were selling veterinary medicine containing antibiotics without being aware of the risks attached. Therefore, the importance of both understanding the farming sector in Maldives as it is being established at a larger scale, and of studies about knowledge, attitudes and practices on AMR was realized. Project partners at MNU will continue to conduct additional surveys to obtain a statistically significant number of samples to inform future awareness-raising campaigns.</p>	
Output 2	Initial AMR knowledge and evidence base through AMR research in the agriculture sector established		
	Indicators	Target	Achieved
	<ul style="list-style-type: none"> – Frequency and level of quality of available AMR data from the agriculture sector of Maldives. – Progressive implementation pathway (PIP) stage for the Assessment Tool for Laboratory and AMR Surveillance Systems (ATLASS) laboratory. 	<ul style="list-style-type: none"> – AMR data generated through pilot research. – >Stage 1 in 2021. 	Yes
Baseline	OPIP stage 1 in ATLASS as of March 2019.		
Comments	Standard operating procedures were developed and laboratory equipment was procured.		
Activity 2.1	Development of a pilot prevalence survey of AMR (depending on the outcome from technical sub-committee (TSC) discussions)		
	Achieved	Partially	
	Comments	<p>Between August and September 2021, a FAO Assessment Tool for Laboratories and AMR Surveillance Systems (FAO-ATLASS) was performed by Regional FAO assessors, with the supervision of a representative of the FAO Regional Office for Asia and the Pacific. From this assessment, a few critical recommendations were put forward. The Maldives Marine Research Institute has not yet started laboratory activity and has a (limited) budget dedicated to AMR activities. Therefore, there is a need to set up laboratory facilities and equipment, improve staff training, perform technical practices according to international standards, and reinforce the collaboration with the Maldives Food and Drug Authority (MFDA) and the National Health Laboratory in the field of AMR surveillance. Due to the limited availability of equipment and trained staff at the Institute, it is considered premature to develop a national action plan (NAP) against antimicrobial resistance phenomena in the aquaculture sector (NAP/AMR aquaculture).</p>	
Activity 2.2	Establish coordination between TSC surveillance and TSC research		
	Achieved	No	
	Comments	The activity was not achieved, given the assessment of laboratory capacity described above.	

Activity 2.3	Capacity building on AMR data generation, management, analysis, and interpretation	
	Achieved	Yes
Activity 2.4	Comments	<p>Aquaculture production is relatively recent in Maldives, in comparison with the rest of the Asia-Pacific region, with only one hatchery facility currently operational. The facility produces an estimated 40 tonnes of dried sandfish (<i>Holoturia scabra</i> or sea cucumber), mainly for the Chinese market. Although aquaculture feed production is not carried out in Maldives, due to a lack of local demand, the country has the potential for developing aquaculture feeds further. Local demand for aquaculture feed, especially for cultured groupers and milkfish, is expected to increase with the establishment of a multispecies hatchery targeting the production of 100 tonnes of juvenile milkfish for the local pole-and-line fishery and approximately 500 000 grouper fingerlings for small-scale grow-out farmers within Maldives. Although the aquaculture feeds for hatchery production will initially be sourced internationally, local production of lower-cost feed is anticipated with the increasing numbers of grow-out farmers.</p> <p>Due to the current limited availability of equipment and trained staff at the Maldives Marine Research Institute, it is currently considered premature to develop a national action plan against antimicrobial resistance phenomena in the aquaculture sector (NAP/AMR aquaculture). According to the FAO-ATLASS, for the time being, given that aquaculture is still a growing sector, it is considered more appropriate to increase the diagnostic performance of the Maldives Marine Research Institute laboratory, first of all in the sector of bacterial diseases of fish, and, during a second stage, in the use of antimicrobial susceptibility testing (AST).</p>
	Development of National AMR surveillance plan for the agriculture sector	
Activity 2.4	Achieved	Yes
	Comments	<p>A government initiative to develop mariculture enterprises, with the assistance of the International fund for Agricultural Development (IFAD), is currently working on extending aquaculture grow-out operations. In addition, the initiative targets small-scale grow-out operations for hatchery produced brown marbled groupers (<i>Epinephelus fuscoguttatus</i>), as well as for hatchery production of milkfish (<i>Chanos chanos</i>), as an alternative to live feed-bait for the pole-and-line fishery. Although the current requirement for aquaculture feed in Maldives is limited to small-scale research activities, the conditions are expected to change with the development of an aquaculture sector in the country.</p> <p>The Maldives Marine Research Institute is not yet equipped to carry out a correct diagnosis of the principal pathogenic bacteria that can cause diseases in the main Maldivian farmed fish species. It is premature to carry out AST and collect data on the possible presence of AMR phenomena in the aquaculture sector, with the aim of correlating the findings with public health issues. Therefore, laboratory equipment and the minimum reagents necessary to set up a good laboratory of microbiology applied to aquatic organisms were procured, postponing the finalization of the molecular biology laboratory to 2023.</p> <p>To carry out monitoring work in this specific sector, it is essential to first make a correct etiological diagnosis and typing of the pathogens, and then carry out AST in accordance with international standards and guidelines. In this regard, the indications contained in the 2021 FAO guidelines, "Monitoring and surveillance of antimicrobial resistance in bacteria from aquaculture. Regional Antimicrobial Resistance Monitoring and Surveillance Guidelines – Volume 3. Bangkok", are extremely useful and have been used as a blueprint to develop a surveillance plan relevant for the Maldivian aquaculture sector, entitled "Maldivian Aquaculture Antimicrobial Resistance Monitoring and Surveillance Guidelines". An important element underlined in the above-mentioned guidelines is to correctly organize the collection of data (sample origin, test types, identification results of strains and AST), which must then be integrated and compared with those of other public institutions (e.g. the National Health Institute) to ensure reliable results. The guidelines produced will certainly be a useful tool for organizing a correct workflow and putting into practice the basic notions learned during training sessions delivered to the Maldives Marine Research Institute staff. In addition, diagnostic manuals and standards of the Clinical and Laboratory Standards Institute (CLSI) were purchased and shared with the Maldives Marine Research Institute.</p>

Output 3	Infection prevention and control (IPC) guidelines in livestock, aquaculture, crops, and companion animals developed and piloted		
	Indicators	Target	Achieved
	Number of accessible IPC measures in place for livestock, aquaculture, crops and companion animals.	At least one IPC program is developed and implemented in livestock, aquaculture, crops, or companion animals.	Partially
Baseline	0		
Comments	<p>The recommendations delivered in the “Report of the Antimicrobial Resistance (AMR) Infection and Prevention and Control” (January 2022) are outlined below.</p> <p>Existing legal frameworks and measures regarding control, containment, culling and disposal of infected animals and livestock products should be reviewed. If necessary, update the legislations to accommodate AMR, food safety and zoonosis issues. This review could support the development and implementation of a sufficient legal framework and corresponding organizational structure.</p> <p>As Output 1 results have shown, there is the need to increase farm producer awareness through a widespread educational campaign, including the ways in which to recognize animal diseases and how and where to report any suspicious or sick animals. Currently, custom officers control regional entry points without proper guidance. For this reason, there is also the need to raise the awareness of custom and port health officers on the importance of good quarantine and hygiene practices, to prevent the import of plant and animal pests and diseases in the country. To this effect, issuing a MoFMRA circular listing banned antimicrobials in food animal production would be useful. Raising awareness at field level is crucial, which includes prescribers, farmers, suppliers, drug vendors, paraprofessionals, etc. The programme could follow the format used for the AMR awareness programme conducted for medical officers.</p> <p>Diagnostic facilities for AMR and specific reference laboratories should also be part of IPC measures to improve the surveillance and diagnostic capabilities for the early detection of disease, including new and re-emerging transboundary diseases.</p> <p>A well-coordinated IPC programme at national and health facility levels should be carried out and should include good national IPC guidelines, policies and strategic plans. Establishing a coordinating IPC committee would support the roll-out of the IPC programme. It is important to note that the animal health sector biosecurity guidelines mainly target large- and medium-size farms, and do not sufficiently address protecting animal health from Avian influenza. In this sense, biosecurity guidelines for smaller-scale farmers are needed.</p> <p>Veterinary drugs are also part of IPC guidelines. The guidelines prepared jointly by the World Health Organization (WHO), FAO and the World Organisation for Animal Health (OIE) to strengthen the collaboration between animal and human sectors at the country level should be followed to enhance the intersectoral coordination in Maldives, with participation from local authorities. The capacity of veterinary and medical laboratories professionals and their understanding of AMR and zoonosis issues on food security should be strengthened. The farm-to-fork approach should be adopted in public health risk analysis procedures regarding all foods of animal origins. Guidelines prepared by OIE for good farm management practices should be considered for implementation. To address AMR risks to food security, the existing veterinary drugs registration process in Maldives has to be revamped. The veterinary unit of MoFMRA should be strengthened and strong links with the Health Protection Agency and the MFDA of the Ministry of Health (MoH) should be developed to encourage collaborative research opportunities. It would be most useful for the MoFMRA’s database to be upgraded to include more categories of data and more current information including Global Positioning System coordinates for every goat and poultry production unit. Improvements of this kind are being planned or are now being implemented.</p> <p>As previously considered, AMR surveillance is a cornerstone of IPC guidelines for animal health. Launching a surveillance programme would operationalize this purpose and should be based on MoH and MFDA networks and laboratories. At the initial stage, all livestock farms should perform antimicrobial sensitivity testing before starting any treatment for identifying bacterial diseases, and also for any sample submitted before antimicrobial treatment. All information regarding tests and results should be clearly reported and cultures should be sent to the bacteriology division for further testing. Correspondingly, a database on antimicrobial-resistant bacteria, based on the locality, should be developed to inform an antimicrobial usage policy for the country to be circulated among all practitioners. This should be regularly monitored and updated. The MFDA should have the responsibility of developing this database, given their mandate and capacity. Finally, a convention on prevention of AMR with pharmaceutical importers and producers should be organized to prevent malpractices and enhance good practices to control and contain AMR.</p>		

Activity 3.1	Survey of existing practices, available IPC measures and biosecurity guidelines for agriculture (animal husbandry systems, fisheries, and the food chain)		
	Achieved	Partially	
	Comments	This activity included the completion of a scoping review of basic farm-level practices in Maldives, available terrestrial and aquatic animal IPC measures and biosecurity guidelines, as well as a survey on access to animal health services/extension and diagnostics. However, it was not completed or piloted due to time and human-resource constraints.	
Activity 3.2	Develop and pilot IPC guidelines in animal health		
	Achieved	Partially	
	Comments	A survey of existing practices (IPC measures, farming practices, biosecurity and other related measures, such as vaccination programmes, government programmes, etc.) that were relevant to animal husbandry, production or health (from farm to fork along the food chain), and have linkages to the use or application of antimicrobials was initiated. However, as above, it was not fully completed due to time and human-resource constraints.	
Activity 3.3	Identification and capacity building of IPC target groups in the agriculture sector, and improvement of access to animal health assistance		
	Achieved	Partially	
	Comments	Based on the findings from the above-mentioned survey, areas for critical improvement and IPC guidelines development were identified. The activity included the preparation of at least ten technical guidelines that included some or all of the following technical areas: <ul style="list-style-type: none"> – Requirements for hatcheries; – Requirements of animal holding facilities; – Disease reporting procedures; – Procedure for identifying disease areas and quarantine areas; – Inspection procedures for veterinary facilities. Other priority technical areas were also taken into account, if they were linked to antimicrobial use and AMR.	
Output 4	Development of a policy document that supports the national efforts in improving/optimizing use of antimicrobials in the veterinary and aquaculture sector		
	Indicators	Target	Achieved
	National AMR containment policy to control the use of antimicrobials in animals.	AMR containment policy, regulatory framework for AM substances are developed for the agriculture sector.	No
Baseline	0		
Comments	This output could not be implemented, due to lack of time and resources, given the challenges associated with the COVID-19 pandemic, which included the Government's shift in focus to its pandemic response.		
Activity 4.1	Establish a governance structure (task force) for AMU surveillance coordination in the animal sector		
	Achieved	No	
	Comments	This activity was not carried out due to COVID-19-related challenges.	
Activity 4.2	Formulate a regulatory framework for the monitoring and control of antimicrobial substances in the animal sector		
	Achieved	No	
	Comments	This activity was not carried out due to COVID-19-related challenges.	
Activity 4.3	Develop/adapt standard treatment guidelines for animal healthcare.		
	Achieved	No	
	Comments	This activity was not carried out due to COVID-19-related challenges.	

Partnerships and Outreach

For more information, please contact: Reporting@fao.org

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